TYPES OF INTERACTION BETWEEN ENVIRONMENT, RURAL ECONOMY, SOCIETY AND AGRICULTURE IN EUROPEAN REGIONS

TERESA

COOPERATION PATTERNS AND NETWORKS

IN RURAL AREAS (SYNOPSIS REPORT)

Deliverable D 4.2

Specific targeted research or innovation project

Priority 8.1: integrating and strengthening the European research area

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The content of this work does not necessarily reflect the official opinion of the
Community

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EXECUTIVE SUMMARY

TERESA (Types of Interaction between Environment, Rural Economy, Society and Agriculture in European Regions) is a rural development research project co-funded under the 6th Framework Programme for Research and Technological Development and conducted by 12 research institutions from all over Europe.

Based upon the general deficit of agricultural and regional policy not being able to picture the interactions and interdependencies between agriculture and the rest of the rural economy in all its complexity, the main objective of this project is to shed light on these patterns of integration of agricultural structures in different regional contexts.

Cooperational multifunctional rural regions – the new paradigm?

The key theme of TERESA is "the mutual interactions that take place between agriculture, the environment and other aspects, social and economic, of the wider rural development processes". These demands for an integrated and multifunctional role of agriculture are more and more mainstreamed in European agricultural and rural development policies. The dimensions of these claims are frequently categorised as follows (Hall and Rosillo-Calle 1999): the *economic function*, *the social function* and the *environmental function.*

But not only society is concerned by an integrated agriculture, also the supply side – the farmers – have an interest in closer linkages to the rest of the rural world. Differentiating products, moving along the supply chain ("*deepening*"), diversifying activities ("*broadening*") or economic restructuring and pluriactivity ("*regrounding*") are all farmer's strategies for securing income via tying up with other rural actors (cf. van der Ploeg, Roep 2003).

The combination of the demand and the supply side illustrates the objective of TERESA linking multifunctionality with regional cooperation to achieve a truly goal-orientated sustainable rural development. The TERESA focuses on the region and the interdependencies of the economic sectors within the region rather than looking at policies as the starting point of the research. Based on the functions discussed, the TERESA triangular model of sustainable rural development, incorporating the interrelations between agriculture, rural economy, society and the environment into a sustainable rural development, was sketched (see figure below).

Agriculture in the context of multifunctionality and sustainable rural development
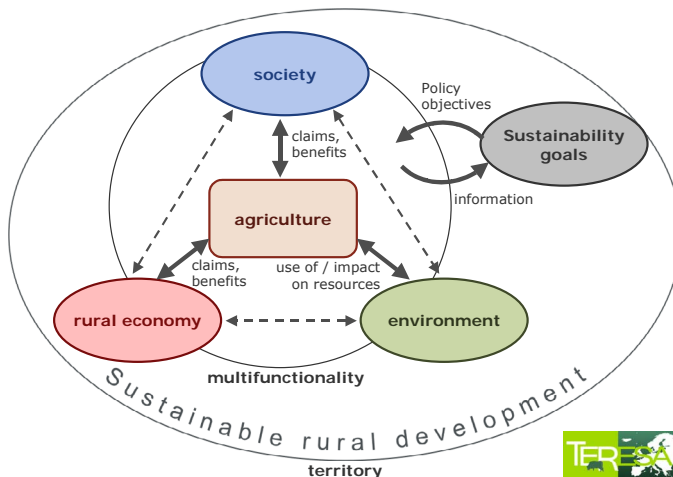
Source: ÖIR adapted from Cairol et al. (2006)

For a long time the prevailing policy paradigm was an *interventionist model* of secluded markets that kept farmers dependent on state aid. The subsequently emerged paradigm that is still favoured by many voices in the US and the WTO is the *competitive model* that is based on a industrialised, large scale agriculture that is competitive on world markets. Moyer and Josling (2002) identify the *multifunctional model* that is largely depending on the theory of public goods (cf. Ostrom 1994) as the third agricultural policy paradigm. For the TERESA project we widened this approach to explore a *cooperative and territorial model* that offers a greater diversity in integrated rural development taking into account the added value of the agricultural sector for the environment, the local economy and social cohesion (cf. Allaert et al. 2006).

Integration patterns in rural areas: as diverse as the regions themselves

These three rural development paradigms all imply different states of integration of agriculture into rural areas in the form of ties, conflicts or no ties between economy, society and agriculture.

➔ The interventionist model is based on the assumption of individual producers that act independently from other actors in the same sectors or other sectors in a *coexistence situation*. This form of (non-)interaction is often combined with a high level of (semi-)subsistence farming and small farm sizes. The resulting low valuation of territorial strengths runs the risk of a low performance of the regions.

➔ The competitive model favours strong producers organised per sector which leads to a *competition situation* with other sectors of the economy but also of the rural system as a whole due to the increasing profitability of certain intensified and large-scale farming systems. The most relevant conflicts between agriculture and other activities in rural areas are competition for labour (either a lack of farm workers or holders of less profitable farming

sectors themselves who quit farming going after wage work) and the natural resources water and land.[1]

➔ The cooperation and territory paradigm uses networks of activities, localities and/or ecosystems for different approaches for *cooperation situations*. Using synergies they may foster tourism, renewable energy production or local crafts and could go as far as using a region for film or other creative industries.

The potential of pursuing one of these strategies heavily depends of the very situation in the regions. Basically, for *regions in economic transition* the decision is largely open which path to follow. An intensification or specialisation (e.g. horticulture) depends on the quality of preconditions such as the availability of high-quality soils and enough water and in some cases (e.g. vegetables) on the distance to the major market areas, i.e. *urbanised and peri-urban areas* have advantages in this field. In peripheral *rural (i.e. remote) areas*, possibilities are more limited and activities will have to rely on natural assets such as beauty and diversity of the landscape. The development of rural tourism also depends, at least to some extent, on the vicinity to urban (market) areas and the accessibility of a region. Adding value to existing products requires special knowledge, a spirit of innovation and in many cases large-scale investments. An integrated rural development concept including agriculture, besides economic constraints, depends on the local social capacity, the will to innovation and other factors.

Empirical evidence of tangible integration patterns

The empirical analysis in TERESA was based on two sources: Firstly, a set of potential integration data was established to calculate a *cluster analysis of European regions according to their specific integration* (NUTS level 2) that allows the identification of specific regional needs[2]. Secondly, information in eleven case studies in selected European areas (NUTS level 3) was collected. The heart of this information collection was the assessment of 43 representative or specific innovative supply chains in these regions that were used for a *typology of interrelations between agricultural production and rural development* and, in a more experimental approach, as input data for an *agent-based model*.

As regards the *supply chains* featured, these can be divided into two basic types of products: *specific products* included traditional and typical products identified by their territory (non-exchangeable such as e.g. origin labelled products like PDO/PGI and exchangeable products that can be clearly identified by their territory) and consumer-driven products (e.g. organic production and/or specialised horticulture around agglomerations). *Standardised products* included exchangeable conventional products but with specific levels of consumption (local, national or

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[1] It is very important to stress that "competition" in the sense used here is not meant purely as economic competition between regions or between economic actors seeking for a better position in the market, but rather as competition for various resources in the sense of sustainable, resource optimising development.

[2] This procedure corresponds tot he approach taken by DG Agriculture when assessing the impacts of EU Rural Development Programmes (see DG Agriculture 2008).
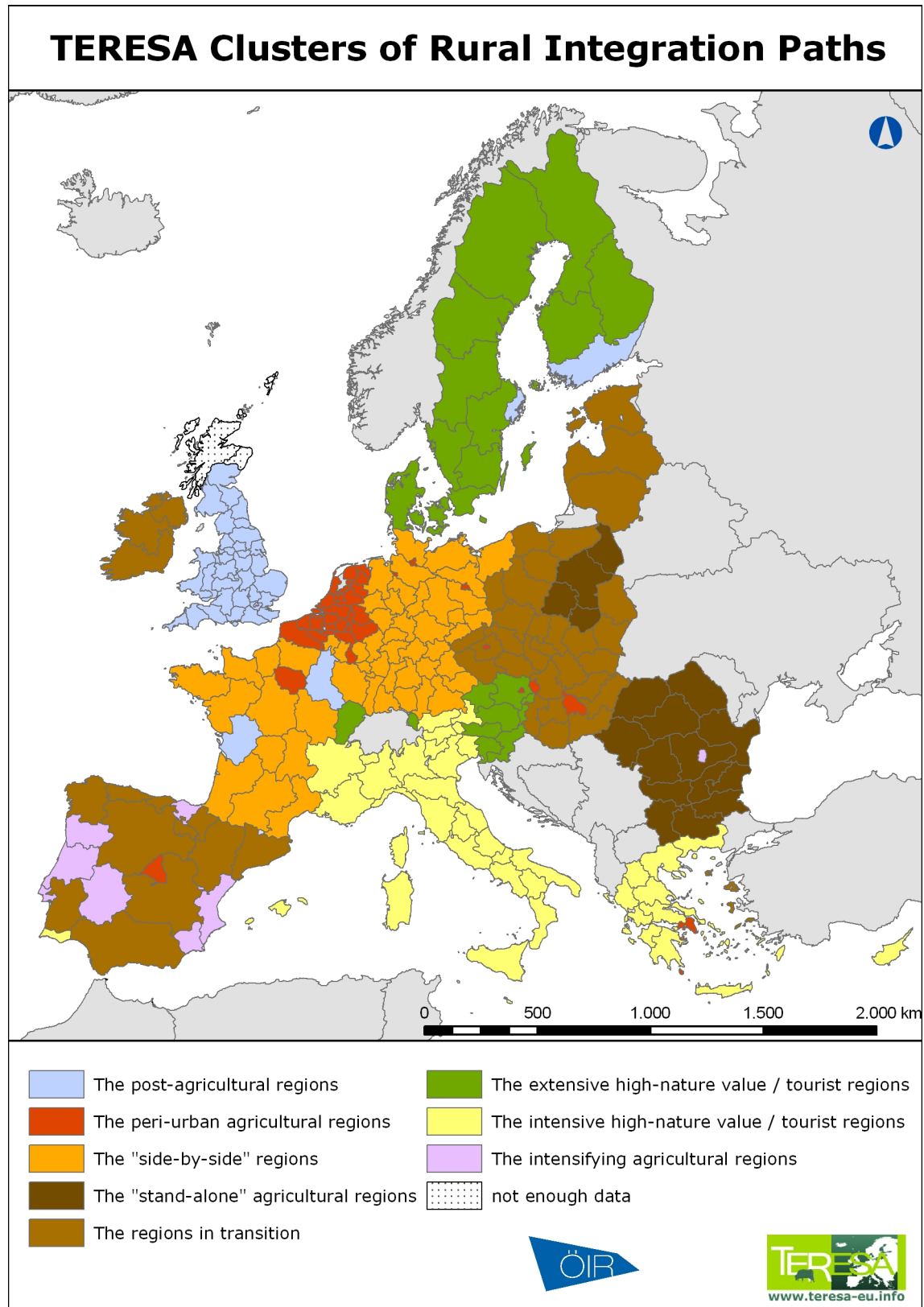
global); however, some of these may be equipped with geographical attributes for marketing reasons (e.g. butter from clean and green Ireland).

The *cluster analysis* showed certain tendencies what type of supply chain is present in a specific type of region. However, it has to be stressed that due to the relatively high statistical/territorial level of NUTS 2 (data availability) there are definitely regions that cannot be allocated to a single cluster as the analysis cannot reflect the diversity within one region. However, the following types of European regions that are illustrated in the map below were distinguished:

There are two types of **urbanised regions** that can be clearly distinguished: The „*post-agricultural regions*" are highly populated with a mix of rural and urban areas with a marginal relevance of agricultural activities but a high level of secondary farmers' activities. These regions often feature consumer-driven specific products and develop short supply chains. Competition as well as cooperation patterns can be observed depending on the regional situation. The "*peri-urban agricultural regions*" are clearly urban, too, but have a very profitable agriculture. These regions can be found in very densely populated areas, mostly around large agglomerations. In these regions, competing land uses are a major source of conflicts. They often feature many standard products either for international markets or with geographical attributes for the (urban) consumer.

In three types of **regions agriculture has neither a strongly co-operational nor clearly competitive links to other sectors** but rather shows a **coexisting pattern**. These more rural "*stand-alone agricultural regions*" still have a very traditional and important agriculture, a low level economic development (but strong growth) and struggle with out-migration. This type can only be found in the accession states of the new millennium. A second type of lagging regions has a clear ongoing transition to secondary and tertiary activities ("*regions in transition*"). Mainly regions from the EU enlargements of 2003 and the Mediterranean regions can be found in this cluster. The type of region that is economically more potent (and in most cases more urbanised) but still has a low level of integration of farming is characterised as "*side-by-side regions*". All these coexistence types mainly feature standard supply chains. The main impact of agriculture is its weight in the local employment but still it seems to be reduced to its primary production food supply contribution. This type of region is typical for central Western Europe.

The 8 TERESA clusters of rural integration paths (executive summary)

TERESA Clusters of Rural Integration Paths

░ The post-agricultural regions	🟩 The extensive high-nature value / tourist regions
🟥 The peri-urban agricultural regions	🟨 The intensive high-nature value / tourist regions
🟧 The "side-by-side" regions	🟪 The intensifying agricultural regions
🟫 The "stand-alone" agricultural regions	⬚ not enough data
🟫 The regions in transition	

Note: intensive high-nature value/tourist regions do not necessarily have an intensive agriculture!

Source: ÖIR

Two types of regions have explicitly *favourable natural amenities* and, as a consequence, *high importance for tourism*. The "*extensive high-nature value/tourist regions*" are very large, with low densities and a high share of predominantly rural areas where tourism is important but not to a large extent ("sustainable tourism") and agriculture is often based on extensive grazing and forestry, in many cases organic. In this cluster, mostly Alpine and Northern European regions can be found. Agriculture mobilizes specific resources for specific supply chains, integrates within local networks, has a small direct contribution to employment but an important contribution to the quality of life (liveliness, culture, landscape, etc.). The other cluster is the "*intensive high-nature value/tourist regions*" where tourism is much more intensive (very high number of bed places, very strong increase of bed places, high amount of nights spent) and also agriculture is more diverse. Most of these regions are located around the Mediterranean Sea. Here the cooperation mentioned in the former type is counterbalanced by competition on land use, water, the workforce, etc..

The final cluster is the most heterogeneous. In the "*intensifying agricultural regions*" *agriculture is strong* as climate (mostly southern regions) and soils are favourable and *urban/economic areas as well as agricultural areas have been expanded extremely recently*. This causes conflicts in land use and water use. Though agriculture has a more important weight in the employment and mainly produces standard products, it is less integrated into the regional development of rural areas compared to the extensive tourist areas.

Summing up, albeit the landscape of European regions is extremely diverse, there similar pathways of integration of agriculture can be observed all over Europe according to regional specifics. Not least, agricultural supply chains shape and are shaped by the regions in which they operate. With these findings the TERESA cluster analysis may help to better steer Rural Development support policies in a way that overall EU policy goals such as ...

➔ Sustainable territorial development
➔ Territorial Cohesion
➔ Integrated regional development to foster competitiveness

...may be more effectively achieved.

In this context the aim of the *TERESA agent-based model* (ABM) was used to explore how interactions and interdependencies between different agricultural network structures and the rest of the rural economy affect rural sustainable development. It engaged especially in the exploration of resilience and robustness of rural systems by modelling rural development based on farming styles, supply chains and farmers' behaviour. Van der Ploeg and Roep (2003) already indicated the importance of these factors on the process of integrated and multifunctional rural development.

The TERESA ABM experiments indicated that the resilience and robustness of agricultural systems cannot be reduced to the level of diversity of a system, to the

behavioural responses of actors to a stress or to the functioning of the system at the time of the stress alone. Instead, the results suggest that the *interactions between decision rules*, their *effect on the function* (or performance) of the system and the *subsequent effects of the performance on future decisions* play an important role with regard to the resilience and robustness of agricultural supply chains. Thus, it is the interaction between function and decision rules that provides a system's ability to cope with stresses.

What multidimensional diversity can mean for Europe's rural future

The TERESA supply chain and cluster analyses and the TERESA agent-based model provide us with two main conclusions about diversification:

➔ *Rural diversity takes place on two basic levels*: Diversity of the rural economy at regional level can be a very successful strategy for providing vital rural regions that manage to keep up pace with today's knowledge society. Diversification at farm enterprise level can help to provide new sources of income can augment otherwise stagnating agrarian incomes which subsequently facilitates the ongoing provision of public goods through agriculture.

➔ *Diversity should not be considered as an end in itself*. There are agricultural supply chains and regions alike that can perform well and be resistant to external influences without major diversifation activities. Their success on one hand depends on the way decisions are taken and by which dynamics they develop over time, and on the other hand on appropriate instruments to avoid negative external effects in case of unsustainable resource consumption.

Consequently, also the improvement of the environment and the countryside can function as a very strong foundation that makes increasing sustainable use of endogenous resources and makes certain diversified activities possible. Nevertheless, a positive performance in terms of competitiveness and quality of life can generate a series of conflicts that have to be taken into account (above all in the competitive patterns).

The analysis of the date gathered in the case studies in TERESA provides a far more precise picture of the situations in rural areas, than the usual common regional scale of NUTS 2, as it is used at the "standard" EU programming level[3]. Moreover, the amount and choice of indicators analysed in TERESA is more apt to depict strengths and integrational patterns of agriculture. Thus, the TERESA cooperation patterns allow for a pluri-demensional and focused addressing of sustainable rural development that manifests itself in three basic strategic directions.

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3   see e.g. the programming areas for the European Agricultural Fund for Rural Development (EAFRD) or the European regional development fund (ERDF) ranging from regional to national programming areas.

First, in the sense of a meta policy recommendation, there is a clear need for *differentiating rural territories*, to take into account the rural diversity and the type of regional development in order to formulate a successful policy[4]. TERESA pushed this approach much further by differentiating regions according to their favoured integration pathways as well as their strengths in agricultural production. Every region has its specific attributes and therefore also its specific needs for the "right" policy mix.

Second, a further shift from the predominant individual level of intervention into agriculture (subsidies) towards a more *rural systemic approach* such as the investments into adding value to regional supply chains, the facilitating of other cooperative regional systems or the building up of local capacity will be required. In this respect, the strategic planning of structural funds would have to overcome the boundaries of the different funding sources to integrate all economic, social and environmental goals into rural development policy.

Third, the aspect of *multifunctionality and the provision of public goods* will have to be included more accurately in development strategies. The provision of public goods, where it is clearly related to agriculture, should be compensated as they constitute an important foundation for the improvement of the countryside and the rural system in order to defend environmental assets against the consequences of structural change (Potter and Burney 2002).

Indeed, the proactive *combination of territorial and systemic approaches* in rural development (e.g. regional supply chain networks) can be a powerful strategy to safeguard local agricultural production (and at the same time local public goods) and creating added value for the environment, the local economy and social cohesion in the sense of public goods (cf. Allaert et al. 2006). In conclusion, strategies to increase the competitiveness of rural areas and the sustainable provision of public goods alike include (cf. van Huylenbroek et al. 2007):

➜ In a *competition integration pattern*, the strengthening of local networks and promoting higher value production introduces the social sustainability dimension into rural development. In this context, a stronger consumer orientation in agricultural production such as prepared primary products *ready-to-eat*, higher quality products or an investment in organic production may be successful. Additionally, the encouragement of sustainable use of natural resources (basically land and water) fosters ecological sustainability (which is important as most of these regions are urban and/or tourist regions).

➜ In a *cooperation integration pattern that is based on activities* (agri-business sector), the strengthening of competitiveness on the basis of territorial resources, i.e. product rather than scale oriented, backs up social and ecological sustainability efforts alike. Here, the focus on traditional and typical products (non exchangeable origin labelled products) or the new development of products which are in principle exchangeable on commodity

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[4] See also the policy recommendations of the Barka Report (Barca (2009))

markets but add value to the customers (and the agricultural income) by a territorial identity is useful.

➔ In a *cooperation integration pattern that builds on a territorial network* already, the further strengthening of the regional identity and creating of vertical markets will increase economic and social sustainability. Direct marketing strategies and the integration of agricultural products into tourism development are important features in this respect.

➔ In *cooperation integration pattern that builds upon an ecological approach*, the creation of local food networks and non-commodity markets will put more focus on economic and social sustainability.

If different regions can be addressed according to their real needs, the outcome will be more sustainable than today, which is also backed by the Barca report "An Agenda for a Reformed Cohesion Policy" (Barca 2009) published earlier this year, in which a place-based approach to meeting EU challenges and expectation has been called for, addressing both Common Agricultural and Regional Policies. Regional and rural policy has already begun a paradigm shift from top-down, subsidy-based approaches into a broader integrated approach designed to improve local competitiveness that takes into account the valorisation of local assets and knowledge in a multi-sectoral approach and is built on the investment in local structures rather than individual subsidies (OECD 2006). With the TERESA approach that assesses the integration capacity and potential of all rural sectors and players, a new empirical basis has been created that can serve as a starting point for a regionally and systemically differentiated rural policy in Europe.

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Abbreviations

ABM	Agent-based model
AOC	Appellation d'origine contrôlée (french equivalent for PDO)
COMECON	Council for Mutual Economic Assistance
DEFRA	Department for Environment, Food and Rural Affairs (government department responsible for environmental protection, food production and standards, agriculture, fisheries and rural communities in the UK)
ESPON	European Spatial Planning Observation Network
EU	European Union
FUA	Functional Urban Area (result of the ESPON 1.1.1 study)
GDP	Gross Domestic Product
GDR	German Democratic Republic
GVA	Gross Value Added
ha	hectare
km²	square kilometre
LFA	Less Favoured Areas
LPG	Landwirtschaftliche Produktionsgenossenschaft (agricultural production cooperative in the GDR)
PDO	Protected Designation of Origin
PGI	Protected Geographical Indication
PPS	Purchasing Power Standards
UAA	Utilisable Agricultural Area
WP	work package

Case study countries

AT	Austria
DE	Germany
ES	Spain
FR	France
HU	Hungary
IE	Republic of Ireland
IT	Italy
NO	Norway
PL	Poland
RO	Romania
UK	United Kingdom

0   INTRODUCTION

TERESA (Types of Interaction between Environment, Rural Economy, Society and Agriculture in European Regions) is a rural development research project co-funded under the 6th Framework Programme for Research and Technological Development and carried out by 12 research institutions from all over Europe.

Based upon the general deficit of agricultural and regional policy not being able to picture the interactions and interdependencies between agriculture and the rest of the rural economy in all its complexity, the main objective of this project is to shed light on these patterns of integration of agricultural structures in different regional contexts.

Analysing the interrelationships between agriculture and non-agricultural sectors in selected European rural regions, the TERESA project aims at contributing to the improvement of knowledge about the patterns of integration between agriculture and the rest of the rural economy and the environment, identifying supply networks within regions taking into consideration the multifunctionality and sustainability role of agriculture.

The work within TERESA was organised along five work packages (WP):

➔ WP 1 "European background" summed up the relevant policy background, especially focusing on the different policies that are influencing rural development and diversification in rural areas.

➔ This empirical analysis was done in WP2 "Case Studies" by eleven case studies in selected areas. The case studies investigated the interrelationships between agricultural and non agricultural activities by analysing supply chains in the agricultural sector as well as the relationship of (agricultural) production, environment, land use and quality of life in different European rural regions.

➔ WP3 "Modelling" used the input of WP1 and WP2 to set up an agent based model to show how different patterns of behaviour can influence the development of supply chains in rural areas.

➔ WP4 "Synopsis" is the main output of TERESA in terms of scientific results. It sums up all the reviews and methodological inputs from the previous work packages serving as input for WP 5 "Policy options", which is mainly addressed to the makers of rural policy and administration.

➔ Finally, based on the results of WP1 to WP4 in WP5 "Policy Options" different policy options for the future development of rural policies were elaborated. The impact of the different policy options on rural development were analysed via a SWOT analysis.

This deliverable as the main output of WP 4 combines different scientific analyses summing up all results from WP 1 to WP 3 paving the way for the development of policy options in WP 5 to answer the main research issues. It

➔ identifies patterns of integration between agriculture and the rest of the rural economy and the environment, in different types of rural areas in Europe,

➔ shows the advantages and disadvantages that agricultural activities receive from the diversification of the rural economy and vice versa,

➔ shows the advantages and disadvantages that agricultural activities receive from the improvement of the environment and the countryside,

➔ analyses which paths of developments lead to a higher competitiveness of agriculture in rural areas and towards a sustainable rural development, identifying strategies for success.

This synoptic report at hand consists of five main parts:

In chapter 1, a short theoretical "*Background of the study*" is given that includes a review of some state-of-the art literature and explains the main research questions.

Chapter 2 provides the focused "*Review of the TERESA case studies*" focusing on the answering of the research questions, to give empirical hints on what are the present interlinkages of agriculture, environment, society and the rest of the environment and what are the potentials. Most important issues are the integration in agricultural supply chains, diversification and the integration of other gainful activities of farmers, the interdependencies with the environment and the role of agriculture in society.

Chapters 3 and 4 are the empirical analysis parts of the synopsis. In chapter 3, 31 supply chains that were surveyed in the case studies get typologised and analysed in the "*In-depth analysis of the integration of supply chains into rural development*".

In chapter 4 a conceptual typology of a quantitative "*Analysis of Integration patterns of agriculture into rural development*" was elaborated. As a method to combine very heterogeneous indicators and qualitative information, the Ward method for building statistical clusters was chosen to test the conceptual types and to compare the European regions to each other. It uses the database that was established in WP 1 "European background", amended with additional data from trans-European sources, mainly land use and structural business data (Eurostat, European Environment Agency).

For revision, the preliminary types were tested reverting to the case study information, the case study authors' local expert knowledge in chapter 5 "*Testing the results*".

The revised typology of integration patterns has then been used together with WP 3 "Agent-based modelling" results to form the summary of advantages and disadvantages from diversification and improvement of environment and countryside in the "*Conclusions*" chapter 6. The implications for future policies were then identified and passed on to WP 5 policy options.

Additionally, the synopsis report gets enriched by presentations and discussions of the "Rural potentials for regional development" conference that was organised within TERESA.

Figure 1   Structure of the WP 4 analysis
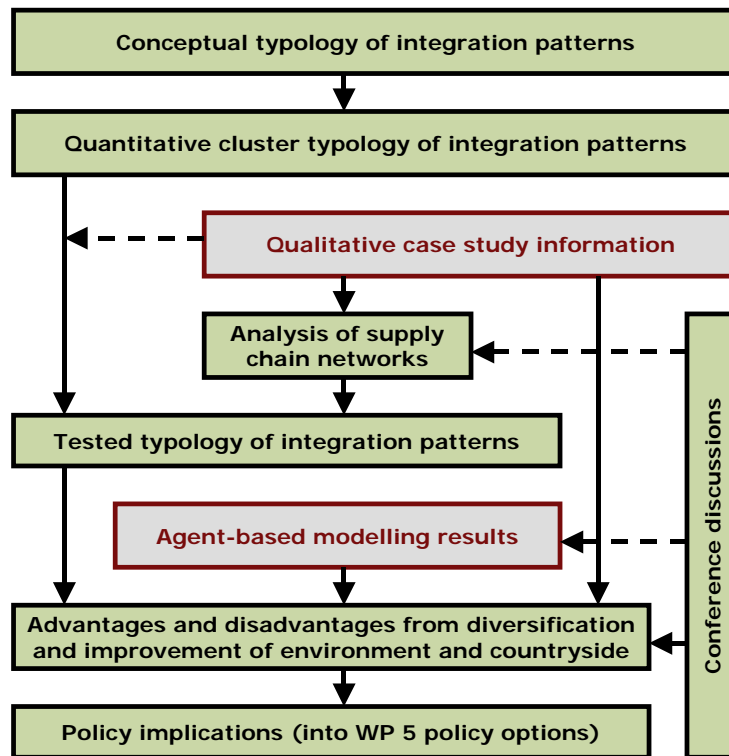
Source: ÖIR

1   BACKGROUND OF THE STUDY

"A living countryside is essential for farming, as agricultural activity is essential for a living countryside."

This is how the introduction to the call for the TERESA project formulated the interrelationships between farming and other activities in rural areas. It reflects the approach of the present CAP that consequently includes measures designed to promote a living countryside with high environmental standards and to gain an improved competitiveness of the farming sector.

The claim of society towards agriculture

Under this overall framework the key theme of TERESA is "*the mutual interactions that take place between agriculture, the environment and other aspects, social and economic, of the wider rural development processes*". These demands for an integrated and multifunctional role of agriculture are more and more mainstreamed in European agricultural and rural development policies. As Fischler (2008, TERESA conference presentation) pointed out in the TERESA conference, agriculture is much more that the production of food, feed and fibre alone: it has multiple goals, potentially providing sustainability, food and environmental security and safeguarding and enhancing Europe's cultural heritage amongst others (Figure 2).

Figure 2   Farming vs. agriculture

Source: Fischler 2008 (TERESA conference presentation)

The dimensions of these demands are frequently described using the following functions (Hall and Rosillo-Calle 1999):

➔ *The economic function*: agriculture remains a driving force in sustaining and supporting the entire economy and especially the employment in rural regions.

➔ *The social function*: the perpetuation of a living countryside is essential to sustaining the quality of life of in rural (and also peri-urban) areas and keeping them from getting abandoned. The preservation of local knowledge

and the relationships between rural actors are a storehouse for cultural heritage.

➔ *The environmental function*: agricultural land use can have beneficial (or harmful) effects on the environment such as biodiversity, landscape, water management and quality and pollution.

This categorisation so far covers, as indicated, the demand site of an integrated agriculture fulfilling multifunctional goals.

The requisites of agriculture

But not only society is concerned by an integrated agriculture, also the supply side – the farmers – have an interest in closer linkages to the rest of the rural world. Van der Ploeg (et al. 2002) groups rural development activities from the view of the farm enterprises into three dimensions (Figure 3) that basically all relate to linkages of agriculture to the other actors rural region.

Figure 3   Structure of rural development at farm enterprise level
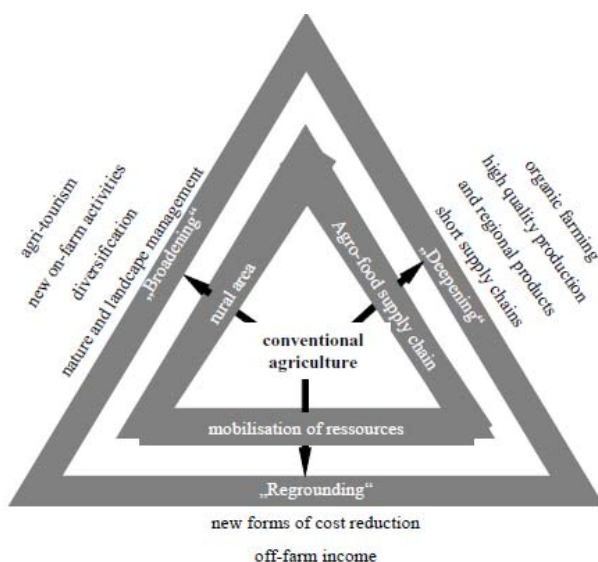
Source: van der Ploeg et al. 2002

He calls these dimensions *the main axis of [today's] rural development*:

➔ "*Deepening*" means farms differentiate their productive potential by moving towards agricultural goods with unconventional characteristics (organic products, quality products, typical products, etc.), or by moving along the supply chain, acquiring functions down the line from production (on-farm processing, direct sales, etc.). The specialisation in products, processing and marketing require better (traditional) knowledge, a higher level of (innovative) technology and tighter ties with downstream actors in food supply chains and/or the consumers.

➔ "*Broadening*" involves a process of expanding income-producing activities, some of which can also be completely independent of farming, by exploiting entrepreneurial activities in a rural context wider than strictly agricultural, as e.g. forestry and fish farming, agro tourism and production of energy crops.

This requires by nature the establishment of links to actors in non-agricultural sectors and/or different customer groups than before.

➔ "*Regrounding*" contains pluriactivity and those cases in which production costs are reduced, hence the autonomy of the farm is increased, by replacing internal to external inputs, i.e. economic restructuring of the present production. This does not automatically require a higher level of integration; in the sense of cost reduction we would add a closer cooperation within agriculture – seeking for economies of scale and synergy effects – to this context (mobilization of resources, e.g. common management of plots, cooperatives).

A short clarification of diversity and diversification

As was discussed in more detail in TERESA deliverable D 3.2 DIVERSITY AND RESILIENCE OF RURAL AREAS – REPORT, the concept of diversity in rural areas is usually addressed in three different ways. Basically, we refer to diversity as a state and diversification as the process to reach this state.

One conceptualisation of diversity is particularly dominant in rural development perspectives where the role of farms is seen as potential *multi-functional rural enterprises* which serve a variety of markets contributing to sustainable rural development (Marsden 2003). *Diversification* as a process in a rural development context usually refers to farmers enhancing their income from sources other than conventional farming production (DEFRA 2007) in the sense of van der Ploeg's (et al. 2002) "broadening". However, there is no exact definition of what constitutes diversification activities. For instance, it is disputed whether part-time jobs outside the farm (either on other farms or in the secondary or tertiary sector) in the sense of van der "regrounding" should be counted as diversification activity. A related use of the concept of diversity in studies on the role of agriculture in rural areas refers to agricultural activities itself in the sense of "deepening". From this perspective, a region that has a *diverse portfolio of agricultural activities* is more stable to stresses than a region that is dominated by one particular agricultural product.

But the concept of diversity is also used to describe the *totality of economic activities within a region*. From this perspective, a region that has multiple economic activities is assumed to be more stable against external influences that affect the performance of the agricultural sector. While the agent-based approach in WP 3 concentrated in exploring the diversity of agricultural activities and agricultural supply chains in the above vein, WP 4 also copes with the totality of activities within a region.

The integration of territory – the TERESA approach

The discussed approaches so far describe in principle the two different viewpoints on multifunctionality of agriculture that have been analysed in present research (inter alias Maier and Shobayashi 2001). Additional to these positions, a more holistic approach incorporating the integrating role of modern agriculture is found in literature. This interpretation brings the territory into discussion, and describes multifunctionality as a concept building new links between consumers and producers that potentially can integrate all activities in the rural space (Wilson,

2001; van der Ploeg and Roep 2003). This combination of the demand and the supply side perfectly illustrates the give-and-take approach of TERESA to explore the advantages and disadvantages from diversification and improvement of environment and countryside for all rural players in a territorial dimension that aims at accomplishing a sustainable rural development.

In that context, TERESA is seeking for innovation linking multifunctionality that as a self standing concept is purely activity-oriented (Maier and Shobayashi 2001) with regional cooperation to achieve a truly goal-orientated sustainable rural development in a time when topics like carbon neutral or energy self-sufficient regions have made it into the mainstream news.

Put in the territorial context, multifunctionality provides a useful analytical framework that helps to explore sustainability based on activities and functions. The link between sustainability goals that denominated by policies and multifunctional activities from the demand and supply side is basically made through the impact activities may have on the environment, both man-made or natural (Cairol et al. 2006).

Based on to these functions, the TERESA triangular model of sustainable rural development was sketched in the beginning, incorporating the interrelations between agriculture, rural economy, society and the environment into a sustainable rural development. Including the multifunctional and sustainability goal dimensions discussed in this chapter, the resulting Figure 4 provides an overview on the refreshed TERESA triangular model.

Figure 4   Agriculture in the context of multifunctionality and sustainable rural development
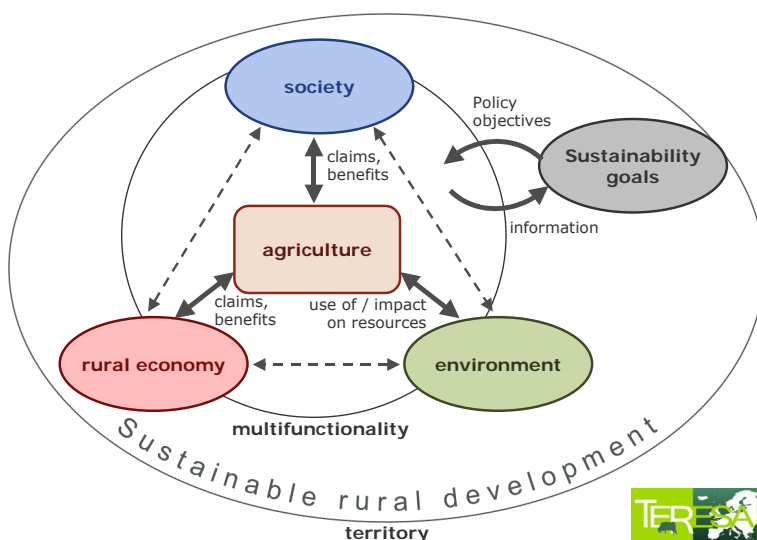
Source: ÖIR adapted from Cairol et al. (2006)

The policy dimension

The territorial scale was not always discussed as widely in the context of agricultural policies. The prevailing policy paradigm for a long time was an *interventionist model* of secluded markets that kept farmers dependent on state aid. Elements of this paradigm can still be found in the OECD today as the TERESA case study Hedmark in Norway or the pillar 1 payments of the CAP, that are still oriented towards absolute commodity output for historic reasons, illustrate. The subsequently emerged paradigm that is still favoured by many voices in the US and the WTO is the *competitive model* that is based on a industrialised, large scale agriculture that is competitive on world markets. Moyer and Josling (2002) identify the *multifunctional model* as the third agricultural policy paradigm.

The concept of multifunctionality as a policy paradigm is depending on the theory of public goods that has also had a major impact on discussion on a future CAP in the recent years. Paul A. Samuelson (1954) is usually credited as the first economist to develop the theory of public goods. In his classic 1954 paper The Pure Theory of Public Expenditure, he defined a public good, or as he called it in the paper a "collective consumption good", as follows:

> *...[goods] which all enjoy in common in the sense that each individual's consumption of such a good leads to no subtractions from any other individual's consumption of that good...*

For instance, the environmental and cultural assets generated through agriculture have the characteristic of public goods, because there is a societal interest in having those goods, while this demand are not provided through market mechanisms.

A shift in Europe to a more integrated territorial approach of agricultural policy was not placed before the 1990s and culminated with the Agenda 2000 CAP reform, which for the first time included a rural development policy encouraging rural initiatives while also helping farmers to re-structure their farms, to diversify and to improve their product marketing (EC DG Agri, no year). The argument widely used is that public money should be targeted at farmers who provide 'public goods'; an introduction of this into the policy mix would require a major reform of the CAP. However, there is a broad scientific and political debate going on about which types of public goods should be taken account of in agricultural interventions and which not (cf. ECIPE 2009). Table 1 illustrates the rural paradigms discussed.

Table 1   Rural policy paradigms

rural policy paradigms	interventionist	competitive	multifunctional		
predominant network pattern	individual producers	producers organised per sector	network of activities	network of localities	[network of] ecosystems
main agricultural model	dependent, small scale commodity producing agriculture	industrialised, large scale commodity producing agriculture	agri-business complex exploiting local comparative advantages	regional food systems with diversification	ecological farming systems
main market for products	world commodity market	world commodity market	world market segments	regional food market	specific markets for integrated and organic products
primary sustainability dimensions	no clear sustainability dimension (low incomes)	economic (employment)	economic (employment and services)	social	ecologic

Source: adapted from Allaert et al. (2006) and Moyer and Josling (2002)

The TERESA project widens this approach and explores a model that offers a greater diversity in integrated rural development, taking into account the added value of the agricultural sector for the environment, the local economy and social cohesion (cf. Allaert et al. 2006).

That is not to say that this multifunctional paradigm is the holy grail – the European countryside is so diverse that there are definitely areas that deliberately favour a competitive paradigm in rural development that can be a driving force for the economic dimension of sustainable development. Thus, controlling tools are required that guarantee that ongoing economic competition does not result in competition for social and ecological resources that undermine a multidimensional sustainability. But as examples, not least from the TERESA case studies, show, multifunctional networks are a promising model for successful sustainable development for at least a large number of European regions.

As a consequence of this discussion, the TERESA project puts the region, the interdependencies of the economic sectors within the region on the centre stage rather than looking at policies as the starting point of any research. However, policy implications as a result of the systemic analysis will be considered in due course of this report and further developed in the final TERESA papers.

2   REVIEW OF THE **TERESA** CASE STUDIES

This section of the synopsis report reviews the WP 2 case studies. In contrary to the general summary already given in deliverable D 2.3 CASE STUDY REPORT, the review here stresses the questions focusing on the analyses of cooperation patterns, the core of TERESA. The complete methodology of the case studies is referred to in deliverable "D 2.2 STANDARDISED DESIGN FOR THE CASE STUDIES", the entire case studies can be found in "D 2.3 CASES STUDY REPORT".

Hence, the following review section includes focused information on these research objectives and is grouped into the following chapters:

➜   A short presentation of the regions selected;
➜   An overview on the rural development situation in general with a special focus on agriculture and its requisites;
➜   An analysis of the integration of agriculture into the environment on all levels;
➜   An analysis of the integration of agriculture into rural economy and society, taking into account the multifunctional dimensions;
➜   The role of policy intervention in these contexts.

All information in this chapter comes from the eleven case studies in "D 2.3 CASES STUDY REPORT", except where noted.

2.1   The selected regions

The empirical analysis in TERESA was supported by eleven case studies in selected areas aiming at shedding light on the interrelationships between agricultural and non-agricultural activities by analysing supply chains in the agricultural sector as well as the relationship of (agricultural) production, environment, land use and quality of life in different European rural regions. As it was envisaged, the eleven case studies represent a variety of European regions. The selected case studies range from highly peripheral regions such as Hedmark and South-West Ireland via medium peripheral regions like Chełmsko-zamojski, Timiş and Murcia to medium central regions like Savoie, Bolzano-Bozen, Lungau, and Barnim to the very centrally located regions of West Sussex (according to the preparatory study for the Second Report on Economic and Territorial Cohesion by Schürmann and Talaat 2000).

The case study profiles were elaborated with a criteria-grid covering all topics relevant for TERESA: agriculture and the three fields of environment, rural economy and rural society (see deliverable D 2.1 LIST OF REGIONS ANALYSED). The result was a mixture of regions that pictures costal and mountain regions, intensive and extensive agricultural structures, from regions that are more strongly influenced by urban agglomerations to peripheral, lagging to developed and prospering regions.

Table 2   Overview on the case study regions, map

Region	Country, NUTS code
Hedmark	NO 021
West Sussex	UK J24
Savoie	FR 717
Barnim	DE 412
Chełmsko-zamojski	PL 312
Murcia	ES 620/62
Timiş	RO 424
Lungau	AT 321
Bolzano-Bozen	IT D10/D1
Bács-Kiskun	HU 331
South West (IE)	IE 025

All regions are NUTS 3 statistical regions, the Spanish and the Italian region also being NUTS 2 regions at the same time. The case study authors, all from the respective countries, undertook statistical analyses, literature reviews, numerous interviews with relevant actors inside and outside the regions. A central information source as well for WP 3 modelling as for the more qualitative analysis in this synopsis were 45 representative supply chains that were chosen regarding their quantitative as well as their qualitative weight in the regions. Table 3 gives an overview of these supply chains which were investigated with standardised questionnaires filled in at interviews and will be illustrated and analysed later in this deliverable.

Table 3   Overview on the exemplary supply chains analysed

Region	chain 1	chain 1a	chain 2	chain 2a	chain 3	chain 3a
Hedmark	UHT milk	(fresh) milk	Synnøve cheese	--	--	--
West Sussex	wheat	rapeseed	milk	local cheese	lettuce	packaged salad
Savoie	Beaufort cheese	milk	goat cheese	--	--	--
Barnim	Brodowin organic milk	conventional milk	wood	energy wood	--	seeds ("Märka")
Chełmsko-zamojski	milk	--	rapeseed	--	Hop (for "Perla" beer)	--
Murcia	pork	labelled pork	tomatoes	RAFT tomatoes	lettuce	packaged salad
Timiş	pork	--	cereals		milk	--
Lungau	milk	--	wood	energy wood	Schnaps (liquor)	--
Bozen-Bolzano	wine	--	apples	organic apples	Speck (smoked ham)	--
Bacs-Kiskun	sunflower oil	--	maize for feeding stuffs	sweet corn	pork	--
South West (IE)	butter for export	--	beef	--	mussels	--

2.2 Rural development status of the regions

2.2.1 The situation of the regions

For the analysis of the integration of agriculture in rural development a number of factors are crucial. The major opportunities for the agricultural communities to secure and to expand their income by altering their degree of connections to other sectors have been discussed in chapter 1. To assess the potentials of these strategies, a number of crucial factors will be discussed:

➔ For "deepening" strategies, the potential markets of a region as a combination of the *population and degree of "rurality"* in a region itself and its *vicinity to urban areas* and the accessibility to other urban and densely populated regions is thereby important. Trans-European centrality is of minor importance as for most agricultural products there is either a limited range of marketing due to their perishable nature or the small quantities available or – in contrary – a global commodity market.

➔ "Broadening" strategies require as well the possibilities to reach economic and population centres with the new services and to attract people into their region and on the *natural value and land use*.

➔ Finally, for "regrounding" strategies, the opportunity to find off-farm labour depends very much on the *economic development* of the region. The possibilities for cost reduction mainly depend on the present *status of agriculture* as e.g. natural preconditions and farm structure and on links within the farming sector.

Population and degree of "rurality"

For the most common way to define the "*rurality*" of a region, a method developed by the OECD is used (also by EC DG Agriculture and DG Regio). According to the OECD-typology regions can be classified in one of the following three categories:

➔ Predominantly rural region: if more than 50% of the population of the region is living in rural communes (with less than 150 inhabitants/km^2).

➔ Intermediate region: if 15% to 50% of the population of the region is living in rural local units.

➔ Predominantly urban region: if less than 15% of the population of the region is living in rural local units.

Map 1 shows the classification on NUTS 3 level for the entire EU. The case study regions are classified as follows (Norwegian region Hedmark has been complemented by TERESA): there are five *rural* (Chełmsko-zamojski, South-West (IE), Bács-Kiskun, Hedmark, Lungau) and five *intermediate* (Barnim, Murcia, Bolzano-Bozen, Savoie, Timiş) regions, only West Sussex stands out as *urban*.

Map 1   Urban-rural typology according to OECD (NUTS 3)
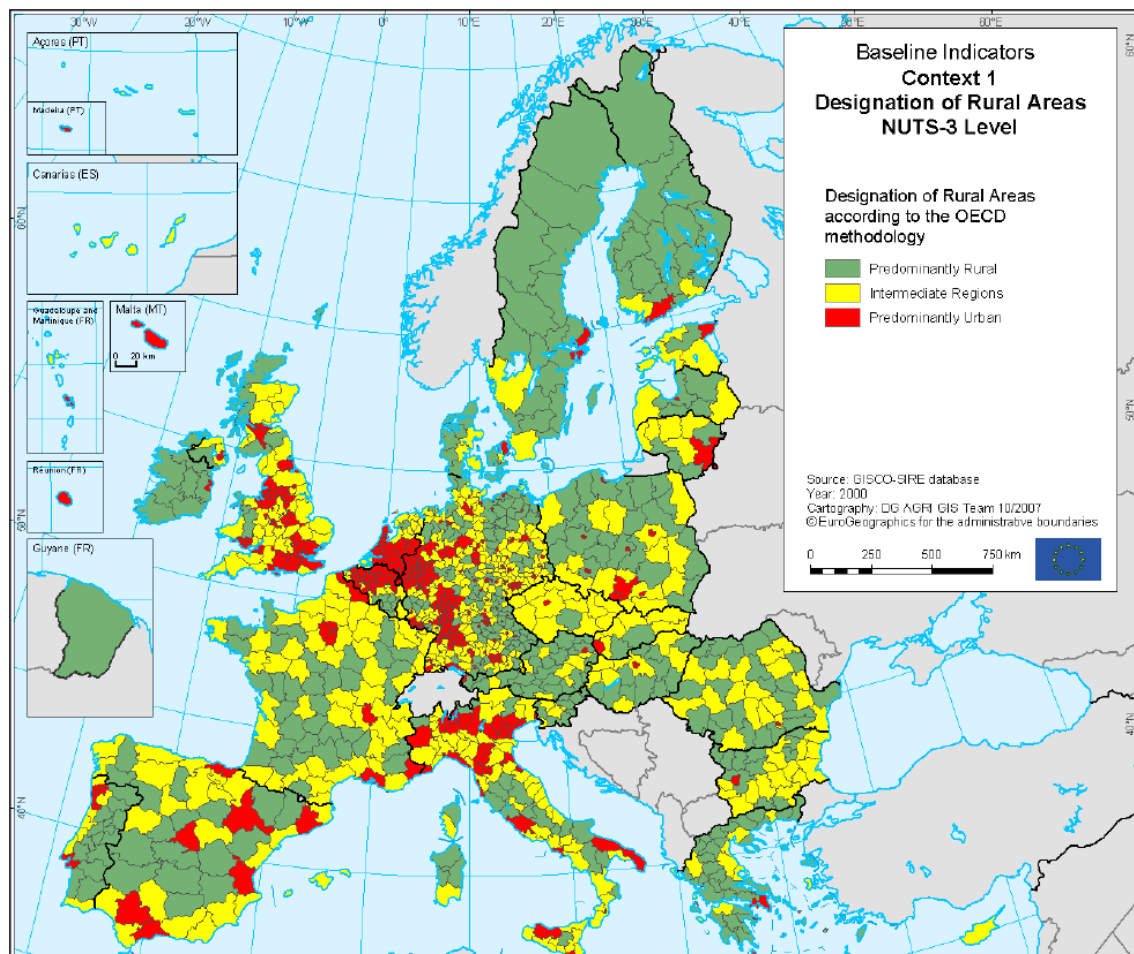
Source: European Commission Directorate-General for Agriculture and Rural Development (2008)

A number of other studies, partly launched by the Commission, have been dealing with baseline indicator sets for typologies of rural regions, which shows that a fully satisfying method is yet to be found. As an example, within ESPON, an approach for defining a typology of rural areas was developed, focusing at the degree of urban influence rather than on pure densities as described in the ESPON 1.1.2 report (Bengs and Schmidt-Thomé 2006). The proposed typology is based on two main dimensions of the rural-urban relation:

➔ The degree of urban influence takes two factors into account: population density and status of the leading urban centre of the region. It indicates functional (status of urban centre equalising functional specialisation, population density equalling size of markets) as well as structural properties (population density equalling built up areas).

➔ The degree of human intervention corresponds to the share of artificial surfaces (and possibly one of the two other land cover categories) within a region compared to the European average leading to a three-class subdivision into high, medium and low human intervention.

Map 2   Urban-rural typology according to ESPON 1.1.2 (NUTS 3)

Source: ESPON 1.1.2
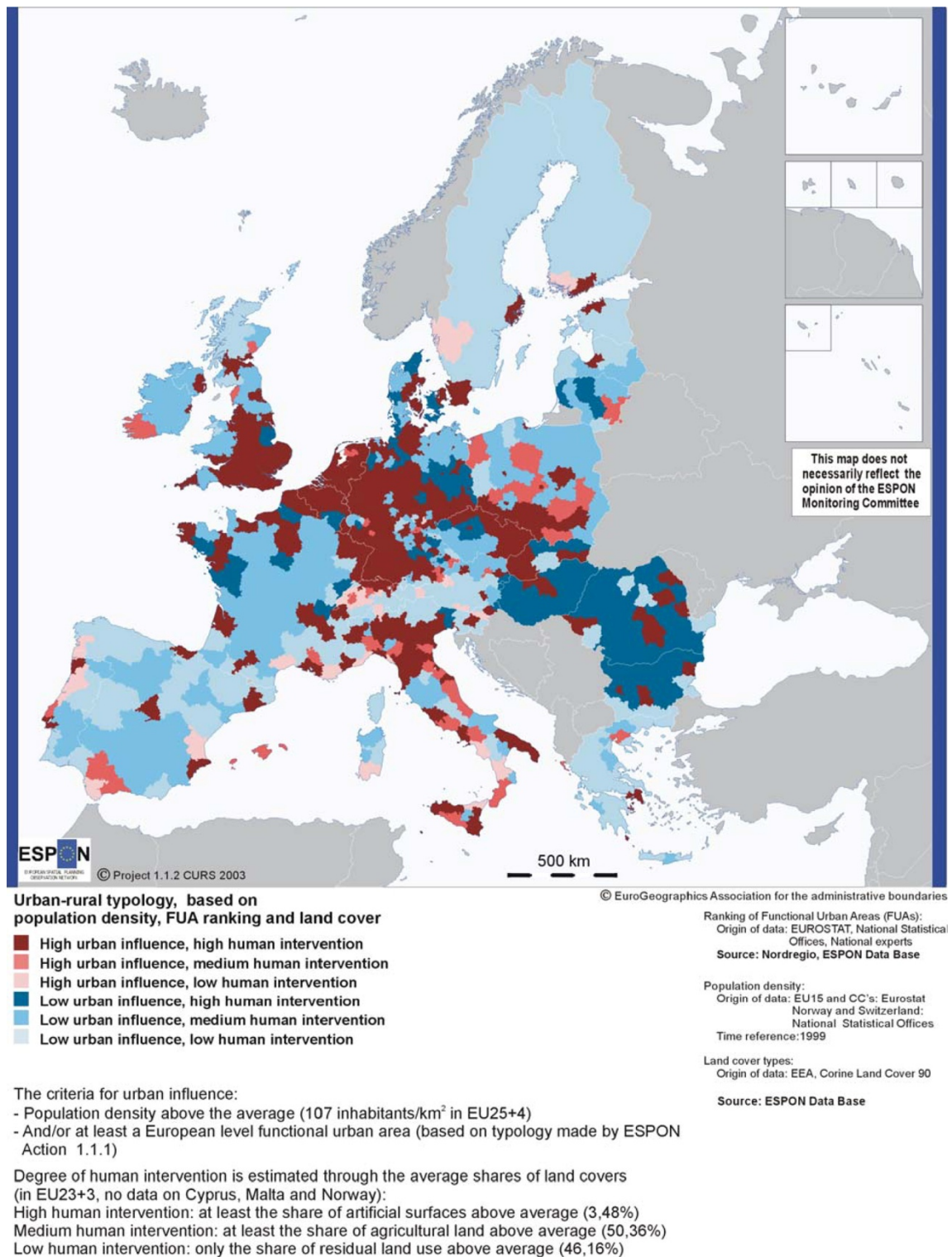
Comparing the ESPON with the OECD typology shows interesting differences: In ESPON, South West (IE) is classified by high urban influence, whereas OECD classifies it as rural. According to the ESPON typology Murcia has low urban influence, whereas the OECD typology classifies it as intermediate region.

The **population development** statistics in Figure 5 do mostly reflect a mixture of economic development and urban influence (e.g. sprawl in Barnim) with Murcia standing out extremely, probably because of the importance of secondary, holiday and retirement housing.

Figure 5   Case study regions: Population development

Population development [%, 1995=100%]
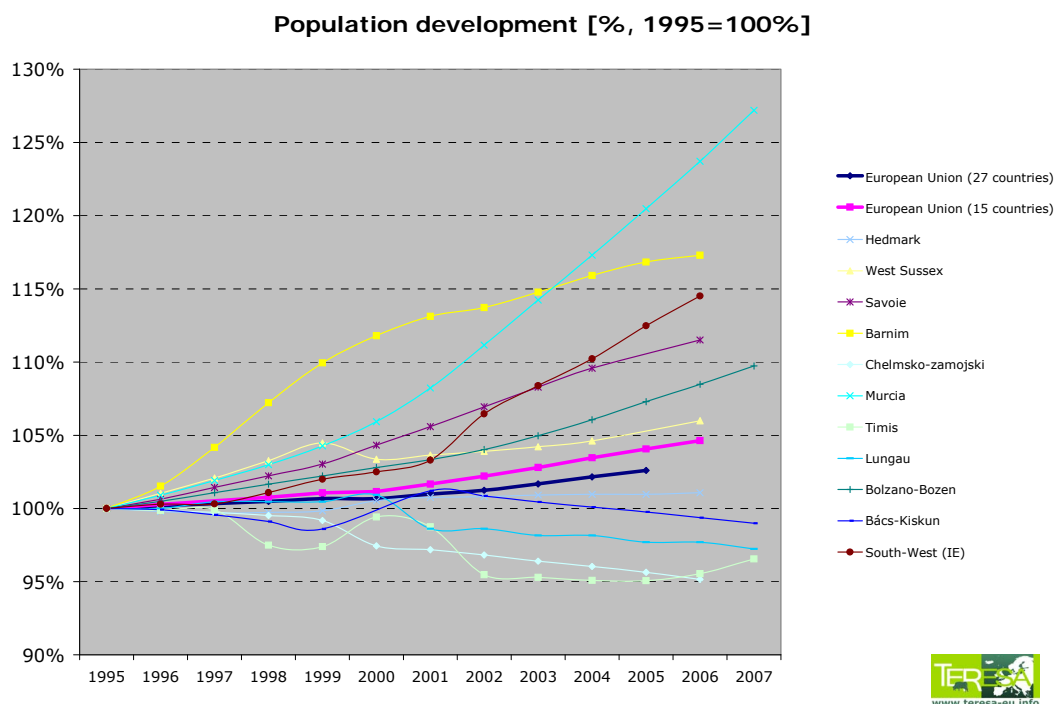
Source: Eurostat regional statistics (missing values interpolated)

Urban influence

The regions comprising larger cities in them or are very close to larger cities stand out in this respect. The major metropolitan agglomerations in the case study regions themselves are Murcia city (1 m+ inhabitants), Timişoara and Cork in Ireland (both around 300,000 inhabitants). All other regions do not have cities much larger than 100,000 inhabitants. As major urban cores are partly located just outside the regions' borders, in Table 4 the largest agglomerations that can be reached in 1 and 2 hour's driving time (suitable for daily trips) are shown.

Figure 6 pictures all these agglomerations and puts them into a context to the population density from above. West Sussex is by far the most densely populated case study region with nearly 400 inhabitants per km^2, which is makes it understandable that it is classified as the only "urban" case study region by OECD standards, although most of its area is utilised for agriculture. West Sussex is being followed with some distance by Barnim and Murcia which are pretty much in the European average over all regions rural and urban. Far off are the more peripheral regions, the northern Hedmark and the inner Alpine region Lungau. The intermediate regions show varying population densities whether rural or intermediate.

Table 4   Case study regions: Largest agglomerations within and nearby

case study region	agglomerations					
	within the region	inhabitants	within 1 hour [a]	inhabitants	within 2 hours [a]	inhabitants
West Sussex	Crawley	99,900	London	11,624,807	-	-
Barnim	Eberswalde	41,787	Berlin	4,935,524	-	-
Murcia	Murcia	1,190,378	-	-	-	-
Chełmsko-zamojski	Chelm	68,160	Lublin	651,578	-	-
Savoie	Chambéry	113,457	Grenoble	514,559	Lyon	1,717,300
Timiş	Timişoara	318,807	-	-	-	-
South-West	Cork	311,479	-	-	-	-
Bács-Kiskun	Kecskemét	109,847	-	-	Budapest	2,393,846
Bolzano-Bozen	Bolzano-Bozen	100,562	Trento-Trient	112,142	Verona	563,952
Hedmark	Hamar	29,077	-	-	Oslo	1,403,268
Lungau	Tamsweg	5,830	Spittal a. d. Drau	15,952	Graz	369,955

[a] *driving time from the case study region's main city; calculated with Google maps route planner*
Source: case studies, Eurostat Urban Audit

Figure 6   Case study regions: Largest agglomerations within and nearby

Largest agglomerations in the case study regions and within 1 and 2 hour's driving time
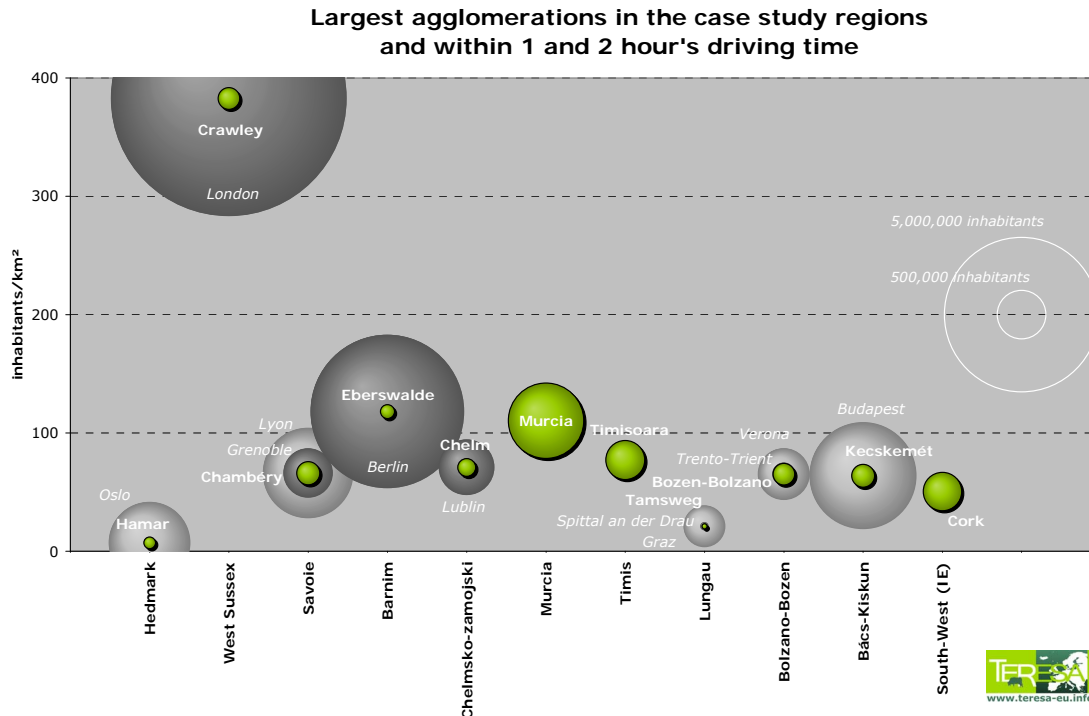
Note: green spheres: largest agglomerations inside the region, names in bold letters; dark grey spheres: largest agglomerations within 1 hour driving time, names in italic letters. light grey spheres: largest agglomerations within 2 hours driving time, names in italic letters. Sphere areas correspond to population numbers.

Source: case studies, Eurostat Urban Audit

In supra-regional accessibility, for the relevant transport modes in TERESA (road, rail) there are a number of regions that have no motorways and very low access to railway (Chełmsko-zamojski, Timiş South-West IE) and some, namely West Sussex, Barnim, Savoie, and Bolzano-Bozen that score high in both transport modes.

Table 5   Case study regions: Supraregional accessibility

case study region	Hedmark	West Sussex	Savoie	Barnim	Chełmsko -zamojski	Murcia	Timiş	Lungau	Bolzano-Bozen	Bács-Kiskun	South-West (IE)
potential accessibility by rail (ESPON space=100)	10	118	152	117	57	28	52	73	113	63	16
average time to nearest motorway (hours)	0,03	0,05	0,03	0,15	>3	0,07	>3	0,28	0,04	0,06	>3

Source: Spiekermann & Wegener, Urban and Regional Research, ESPON 1.2.1

2.2.2   Natural value and land use

Also in the field of the environment that they provide the case studies selected are very diverse.

Hedmark is the third largest county in Norway. A large share of the area is sparsely populated and covered by either mountains or forests. Five national parks are (partly) within the county borders and in 2005 approximately 10 per cent of Hedmark was under national park protection. In addition to the national parks there are several smaller areas with weaker (or equally strong) protection of nature, wild life, waterways, and cultural landscape.

West Sussex is characterized by a variety of landscapes, grazing marshes, floodplains and river valleys; traditionally managed heathland; ghylls and woodland. However, it is one of England's most crowded and most accessible areas with the metropolis London at its northern borders.

Savoie is the most mountainous department of France and situated near Switzerland and Italy. It has numerous assets including historical, cultural and natural heritages mainly related to the mountain part of the department. This is explaining that Savoie is the first tourist department of France, with 60 ski resorts, six spas and lots of summer tourism activities (trekking, gastronomy, …) near the lakes and natural parks. A national park covers 1,150 km² of the 6,028 km² of the department. Moreover, 65.33 km² are situated in nature protected areas, and two natural regional parks are existing in Savoie.

Barnim is a traditional recreation area for the inhabitants of Berlin. Over 50% of the district consists of forests and waterways and its two large nature protection areas (the Biosphere Schorfheide-Chorin and Naturpark Barnim) provide very good preconditions for establishing connections between nature protection, agro-tourism and the maintenance of the cultivated landscape through agriculture.

In Chełmsko-zamojski, the agricultural land is the dominant form of land use in the region as it accounts for 70-80% of the total territory. In view of the domination of the agricultural function and the relatively small area of forests the region of Chełm and Zamosc is characterised by an average area of the legally protected surfaces. National Parks occupy only 1% of the region's territory, and this value has not changed for years.

The region of Murcia is located in the eastern part of the Cordilleras Béticas mountains and it is influenced by their topography. Approximately 27% of the Murcian territory can be described as mountainous, 38% as intramountainous depressions and running valleys, and the remaining 35% as flat lands and plateaux. Murcia has 19 protected spaces. Area covered by protected spaces is 68,012 has., 6% of the regional area. Murcia has an important tourism sector with the facilities along the coastline and concentrated in the north near Alicante.

The total area of Timiş county is of 8.696,7 km2 being the largest county in Romania (3.65% from the total area). The central and western part of the county is part of the Western Plain, while the remaining area is covered by hills and sub mountain relief, but in general the county is less diversified naturally. The Natural Park Mures River Meadow is hosted together with the neighbour county of Arad and other natural reserves and parks are available.

The entire Lungau area is located in the Alps at a minimum sea level of more than 1,000 metres, with the permanent settlement area only being about 122 km^2 (12% of the area). According to these alpine conditions Lungau has a very high share alpine pastures as well as forests. The study area dispose of a high number of nature protection regulations, which is very high compared to other regions.

Characteristic for Bolzano-Bozen (South Tyrol) as well are the vast mountainous areas. 93.3 % of the territory is situated above 700 m above sea level. 43.8% (267,400 ha) of the territory is utilised agricultural area and 47.9% forestry area. On the valley floors most economic and settlement activities are concentrated where an extraordinary and attractive landscape diversity evolved. Tourism in South Tyrol plays a central role within the regional economy. As a diversified income source, tourism influences the development and vitality of rural areas significantly.

County Bács-Kiskun is the biggest one among the 19 counties of Hungary with 8420 km^2, which is about 9 % of the territory of Hungary. Except some of the cities (Kecskemét, Baja, Kiskunfélegyháza, Kiskunhalas) and their surroundings, the land is used for agricultural purposes (flat area) and some part of it is covered by sand which indicates big differences both in soil quality and land prices. There is a national park which has 9 larger territorial areas in the North-West. Furthermore, there are 15 nature conservation areas, mainly in the Southern parts of the county.

The South West of Ireland is a region with diverse social, cultural, economic, physical and policy-development issues. The region's approximately 620,000 inhabitants live across a range of diverse areas – ranging from modern urban settings to small rural towns, isolated farms in mountain areas, islands and

peripheral, small villages. The dominant use of land is pastures. People of the region enjoy attractive landscapes and a deeply rooted cultural heritage.

2.2.3   Economic development

For assessing the possibility to gain other activities for additional income for farmers as well as the potential danger of people getting attracted to quit agriculture, the overall economic development is important.

Selected structural indicators

South-West Ireland is the clear champion when comparing the GDP development, as it has more than doubled over the last 10 years in Power Purchasing Parities and is now in the amazing leading position of almost EUR 50,000 per head (Eurostat regional statistics). All other regions developed more or less similarly to the EU average – albeit on very different levels.

The regions in the New Member States have a rather similar common level of below 10,000 PPP per year and inhabitant, while the Western European Member State regions (except for Ireland) showed a wide range between EUR 10,000 and EUR 30,000 in recent years.

The best opportunities for alternative incomes via off-farm employment (or self-enterprises) can potentially be found in the most prospering regions South-West (IE), West Sussex, Timiş and Murcia.

Figure 7   Case study regions: GDP development per inhabitant, 1995-2004

GDP in Purchasing Power Parities per inhabitant
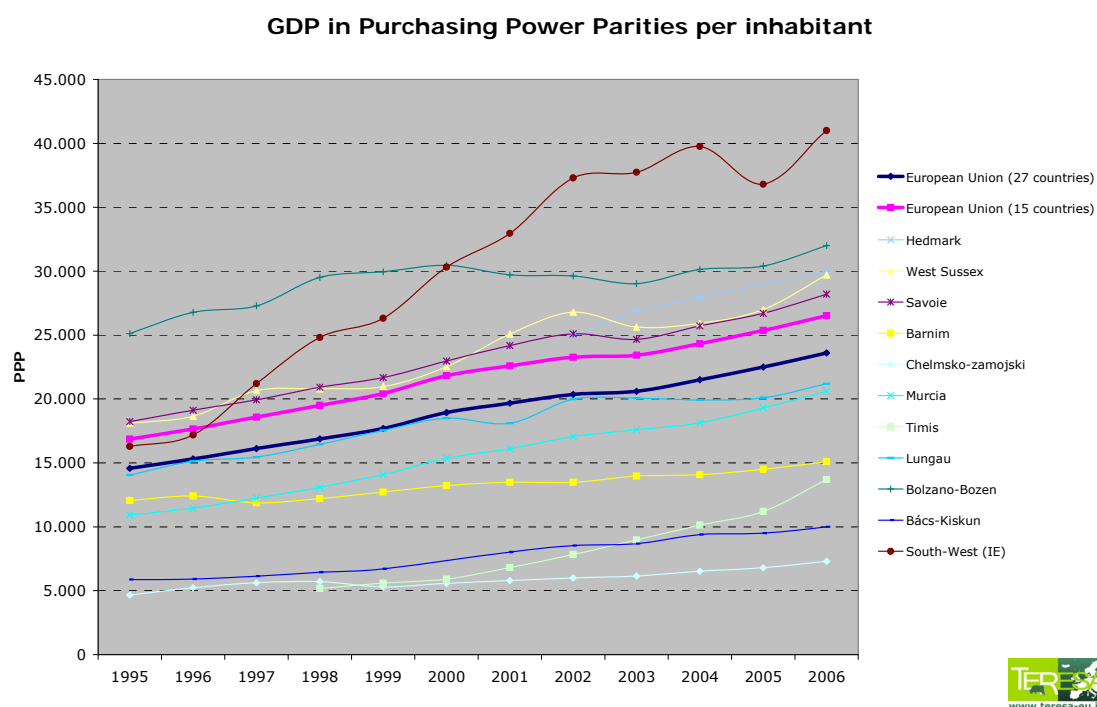
Source: Eurostat regional statistics, Statistics Norway (missing values interpolated, exchange rate for Norway October 2009 only)

However, this is possibly relativised by the newest developments (financial crisis) that cannot be integrated in TERESA anymore in a scientific way due to the timeline until the end of the project. When we compare the GDP values with household incomes in the sense of a more sustainable and socially-oriented development goal as would these days be recommended by Stiglitz et al. (2009), we see that most regions, except for the recent accession regions, are pretty close. Especially in Ireland the high GDP does not seem to reflect a pronouncedly high disposable household income. It has to be stated though, that the numbers come from the NUTS 2 regions.

Figure 8   Case study regions: Comparison of GDP and income
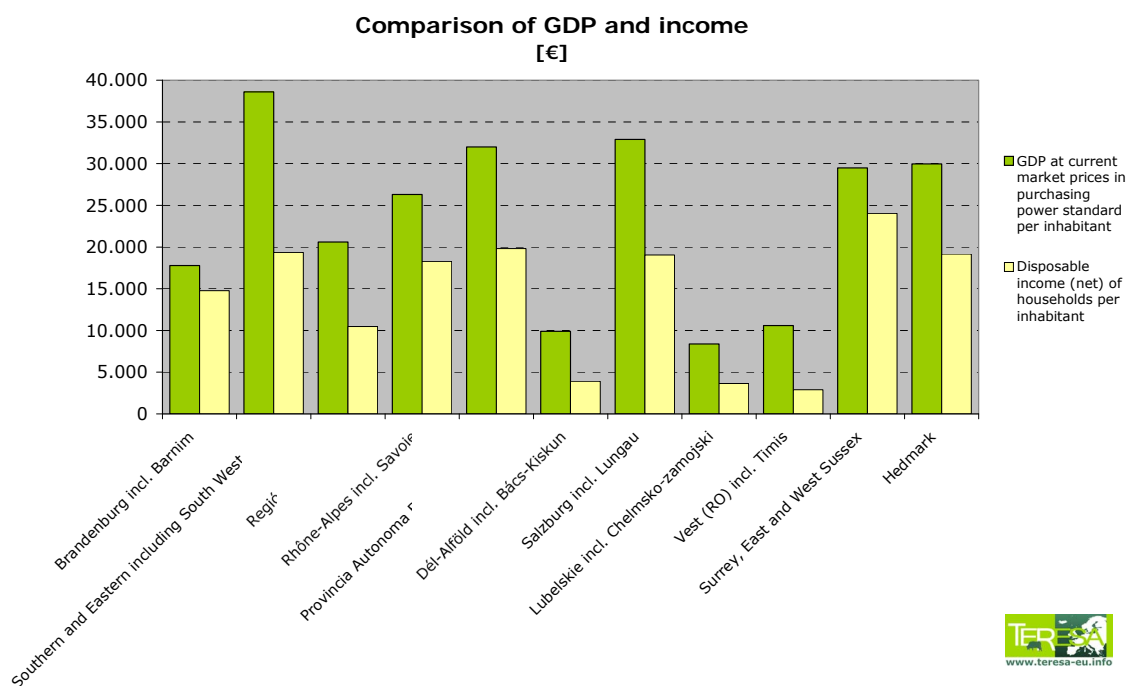
Source: Eurostat regional statistics (NUTS 2), Statistics Norway (NUTS 3, exchange rate for Norway October 2009)

Another very useful indicator to measure the state of development is the labour productivity (GDP per person employed, Figure 9). As can be seen, Hedmark and South West Ireland are the most productive regions among the case study regions, while the two regions in the new Member States Timiş and Chełmsko-zamojski range last.

Figure 9   Case study regions: Labour productivity per person employed

Labour productivity per person employed [EU-27=100]
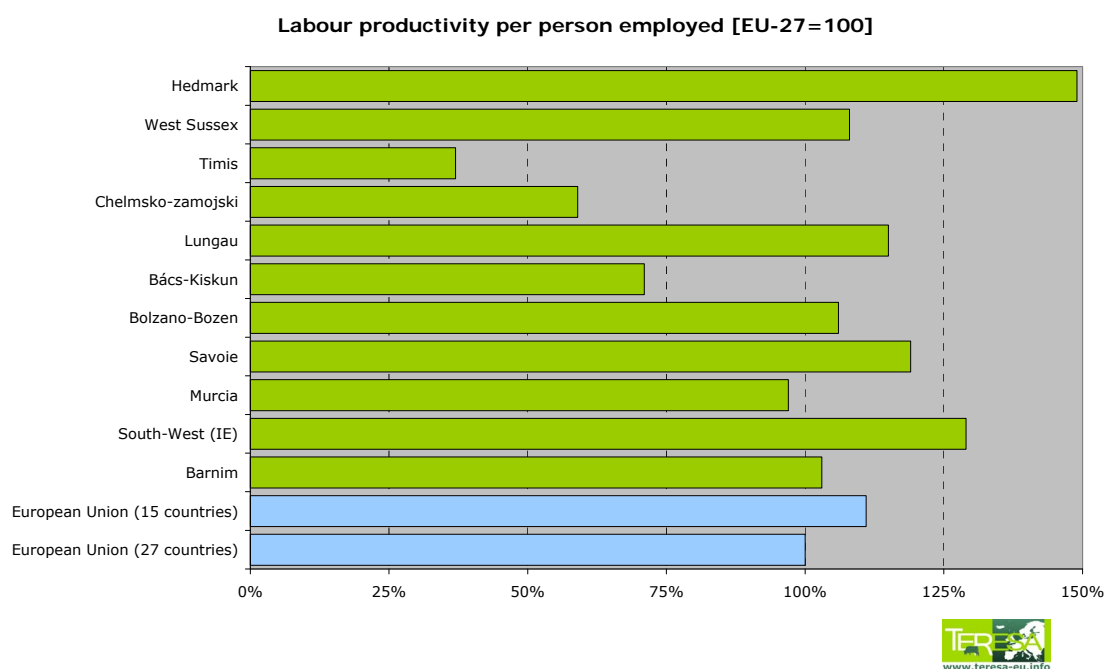
Source: Eurostat (national value for Lungau)

Tourism

In rural areas tourism very much depends on the nature assets (cf. chapter 2.2.2 "Natural value and land use"). Especially for leisure, health and adventure tourism rural areas offer a broad potential, but also more mass-style types of tourism such as skiing and beach holidays are mostly found in rural regions. Tourism can:

➜   be a key element in rural and farm diversification;
➜   help to revitalize market towns and villages;
➜   support important rural services and facilities; and
➜   underwrite environmental schemes and improvements to the built and natural environment. (Department for Communities and Local Government 2006)

Figure 10 and Figure 11 show the different types of bed places in the regions and bed places per inhabitant in the case study regions. Throughout the eleven case study regions the Alpine regions of Lungau, Bozen-Bolzano and Savoie have by far the highest tourism density with about 450 bed places per 1.000 inhabitants (albeit in Lungau this is still very extensive). In all the other case study regions, the tourism is far less important. In Bozen-Bolzano and Savoie ski resorts are of major importance while in Murcia and West Sussex there are numerous beach resorts.

Figure 10   Case study regions: Types of bed places
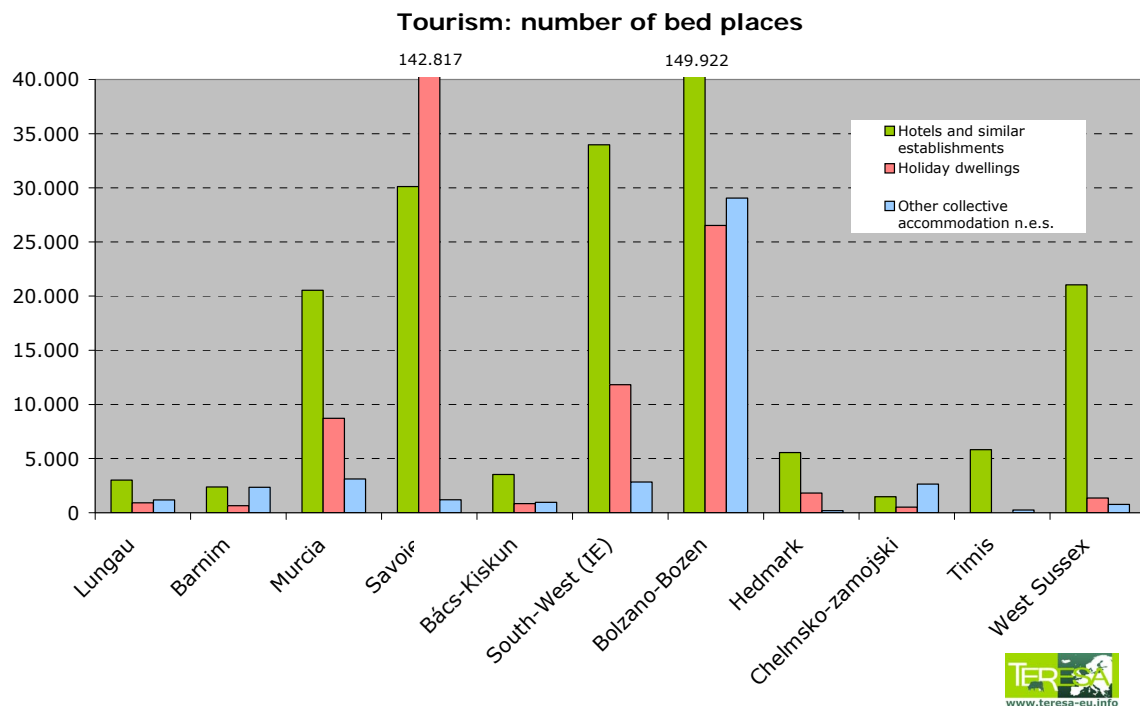
Tourism: number of bed places

Source: Eurostat regional statistics (Data from 2007-2009 used with respect to availability)

Figure 11   Case study regions: Bed places per 1000 inhabitants

number of bed places per 1000 inhabitants

Source: Eurostat regional statistics (Data from 2007-2009 used with respect to availability)

2.2.4   Status of agriculture

Preconditions

The case study regions are very diverse also with regards to their conditions for farming. Savoie, Bolzano-Bozen and Lungau are alpine regions. In all three regions the share of mountain areas is between 90 and 100% in the sense of the LFA regulation art. 18. Also in Murcia parts of the region (approx. 30%) are

mountainous areas. West Sussex, Murcia and South-West Ireland are coastal regions. English West Sussex can be characterised by being located in the outermost influence ring around Europe's largest urban area, Greater London. Murcia is an Autonomous Region at the Spanish Mediterranean coast. South-West Ireland is one of the westernmost European areas at the Atlantic coast. Not only the relief, also the soil quality differs from poor (Barnim) to very suitable (Chełmsko-zamojski, Murcia). It has to be stated though that in all regions the soil quality is very heterogeneous in different subregions. Climate conditions range between limited in alpine regions, medium in Continental regions to favourable in Mediterranean and Atlantic regions.

Figure 12   Case study regions: Share of mountain areas
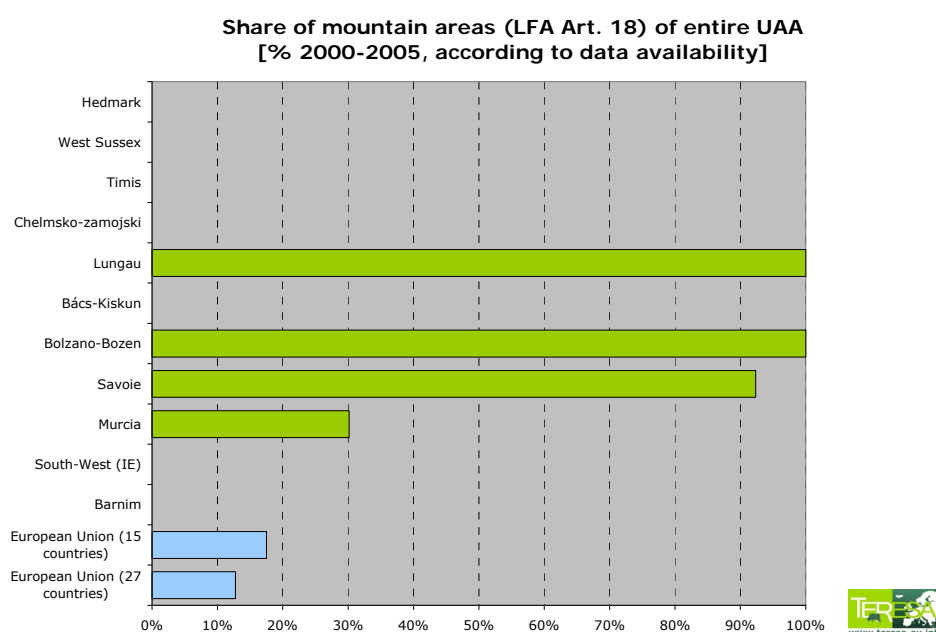
Source: Eurostat regional statistics

Table 6   Case study regions: Agricultural preconditions

case study region	analysis
Hedmark	average soil quality, limited relief [x]), limited climatic conditions
West Sussex	suitable soil quality, favourable relief, favourable climatic conditions
Savoie	average soil quality, very limited relief, limited climatic conditions
Barnim	poor soil quality, favourable relief, favourable climatic conditions
Chełmsko-zamojski	very suitable soil quality, favourable relief, favourable climatic conditions
Murcia	very suitable soil quality, limited relief, favourable climatic conditions
Timiş	suitable soil quality, favourable relief, favourable climatic conditions
Lungau	average soil quality, very limited relief, limited climatic conditions
Bolzano-Bozen	average soil quality, very limited relief, favourable climatic conditions
Bács-Kiskun	suitable soil quality, favourable relief, favourable climatic conditions
South-West (IE)	average soil quality, favourable relief, favourable climatic conditions

[x]) national definition (no LFA)

Source: case studies, European Soil Database (ESDB)

Performance of agriculture

The percentage of the *contribution of the agricultural sector* to regional GDP (Figure 13)shows the economic relevance of agriculture in the region. In the sample of the case study regions there are some noteworthy outliers: The new Member State regions' (Chełmsko-zamojski, Timiş, Bács-Kiskun) primary sector declines much more rapidly than in others, but starting from a much higher level. The exception to some extent is the East German region Barnim, where the large-scale collective farm system has been kept alive on state aid before the breakdown of the COMECON, dissolved rapidly after the German reunion and was already on a low level from 1995 onwards.

In Norway, the relatively high economic importance of the farming sector was very stable which can be explained by the highly regulated quota and price system for Norwegian agricultural products and severe import restrictions, which eliminate competition. In the older Member States, the South-West-Irish farming sector was most clearly declining in this period with only a third of 1995 GDP share remaining after 10 years.

Figure 13   Case study regions: development of the primary sector

Development of the primary sector [% of total GDP]

Source: Eurostat regional statistics (missing values interpolated)
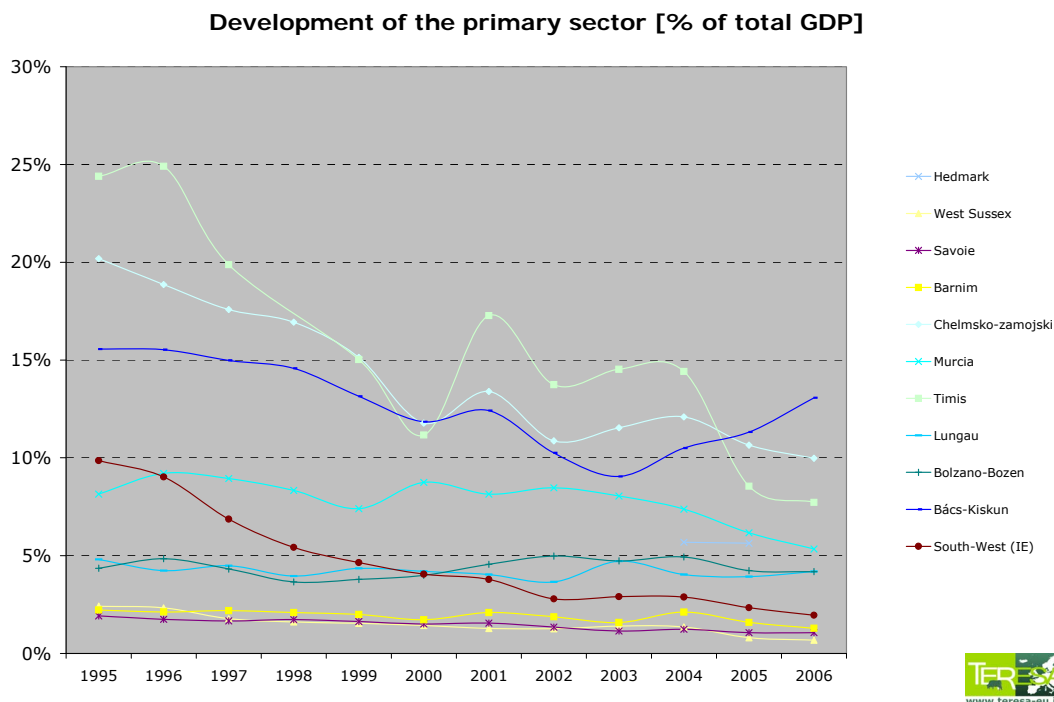
One very intriguing observation can be made: there are just three regions that have a relatively stable contribution of agriculture over the years, but on a low level of under 5%: Bozen-Bolzano, Hedmark and Murcia. According to the case studies, there are two reasons for this development:

➔   Bozen-Bolzano and Hedmark have the most powerful national/regional policy interventions of the case study regions with the Italian region disposing of a number of regional tax deductions and highly discounted rates for insurances and direct transfers (cf. chapter 2.5). Norway has a very limited

foreign trade market for agricultural products (the share of subsidies as a percentage of value of gross farm receipts in Norway is about twice as high as in the EU with 60% – OECD 2009).

➔ In Murcia a big part of the agricultural sector is heavily industrialised, still gets more intensified and therefore is very profitable.

In *employment in the primary sector* (Figure 14), the situation is similar, with the exception that in Chełmsko-zamojski and Timiş (transition countries) and Lungau (labour-intensive forestry) the importance of workforce in agriculture is even more important than the GDP share might indicate.

Figure 14   Case study regions: employment in agriculture

Employment in agriculture [% of total employment]
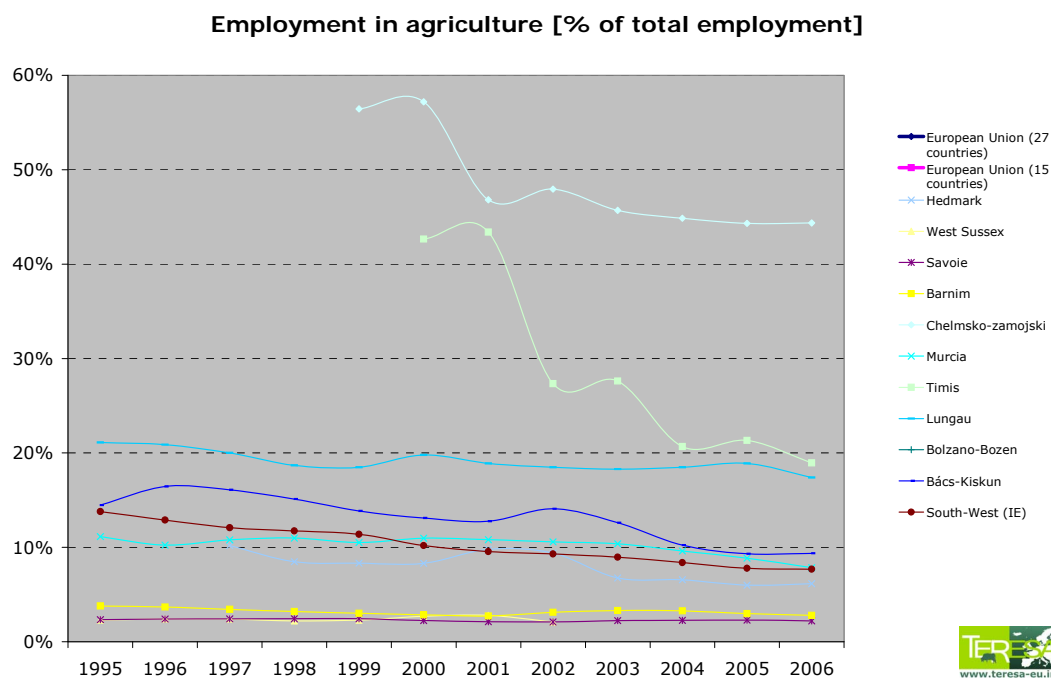
Source: Eurostat regional statistics, case studies West Sussex, Bolzano-Bozen (missing values interpolated)

Structure of agriculture

The *size of the average agricultural holdings* is also very diverse, with West Sussex, South-West Ireland and Savoie being noticeably over European average, the rest below (Figure 15). Barnim has extremely large farms the reason for which dates back to the times of the GDR where huge agricultural cooperatives ('*LPG*') were the standard farming mode.

Figure 15   Case study regions: Average physical and economic farm size

Average physical farm size 2005 [ha]

Average economic farm size 2005 [ESU]
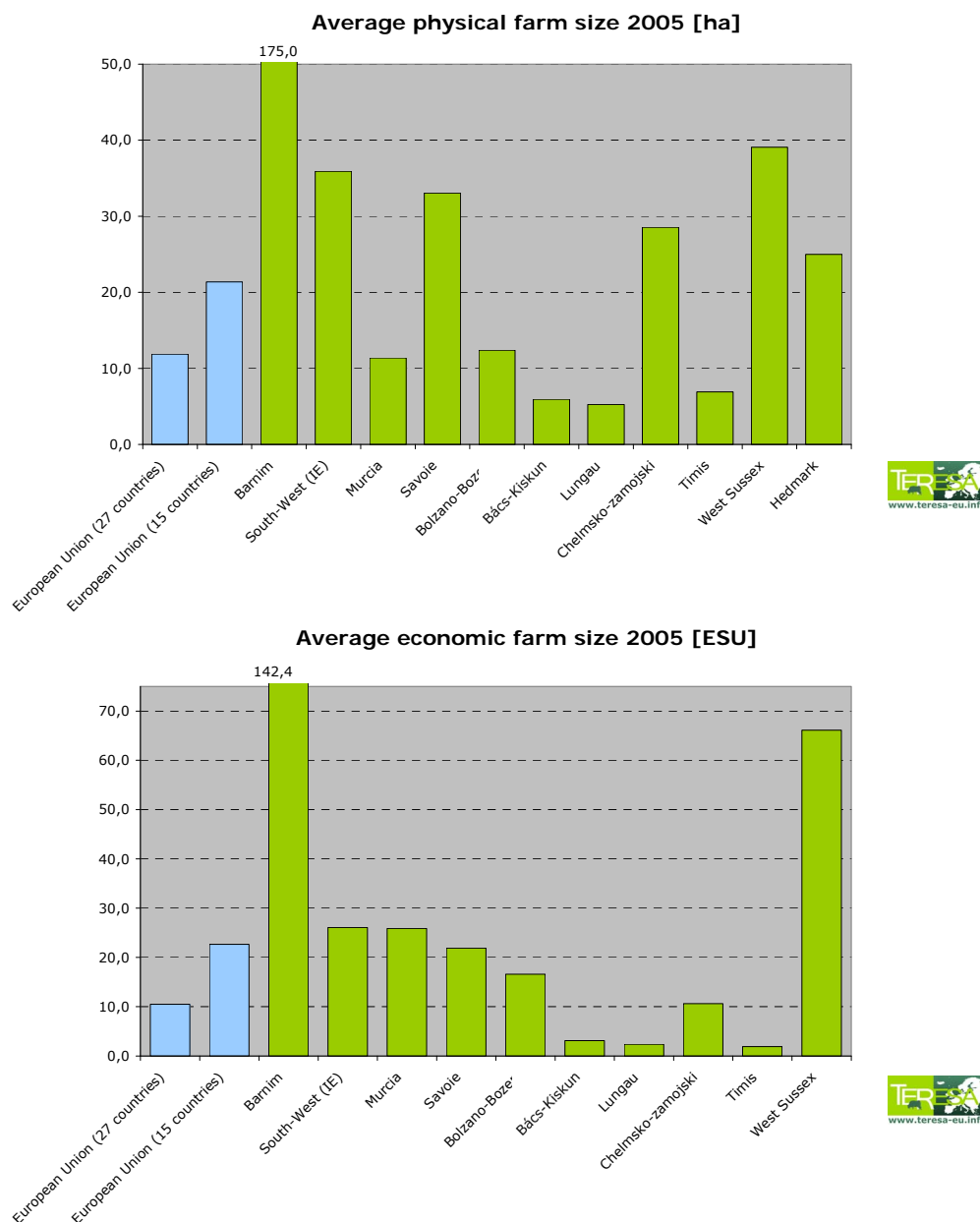
Source: EC DG Agri 2009

In *agricultural production*, there is a great diversity between the regions. While some regions have a large share of (mostly intensive) arable crop commodities (Hedmark, West Sussex, Barnim, Chełmsko-zamojski, Timiş, Bács-Kiskun), others do concentrate on livestock farming (mainly dairy in the Alpine regions Savoie, Lungau, Bolzano-Bozen, dairy and meat production in South-West Ireland) – due to the climatic and topographic conditions. Some regions do have large shares of certain specialised corps (horticulture in West Sussex and Murcia, permanent fruit growing in Bolzano-Bozen). Forestry is a very important sector in Lungau and to a smaller extent also in Hedmark, Savoie, Barnim and Bolzano-Bozen. In the alpine and English regions, extensive grazing is an important mode of agriculture, only in Murcia extensive cropping is widespread (Figure 16).

Figure 16   Case study regions: Importance of extensive agriculture
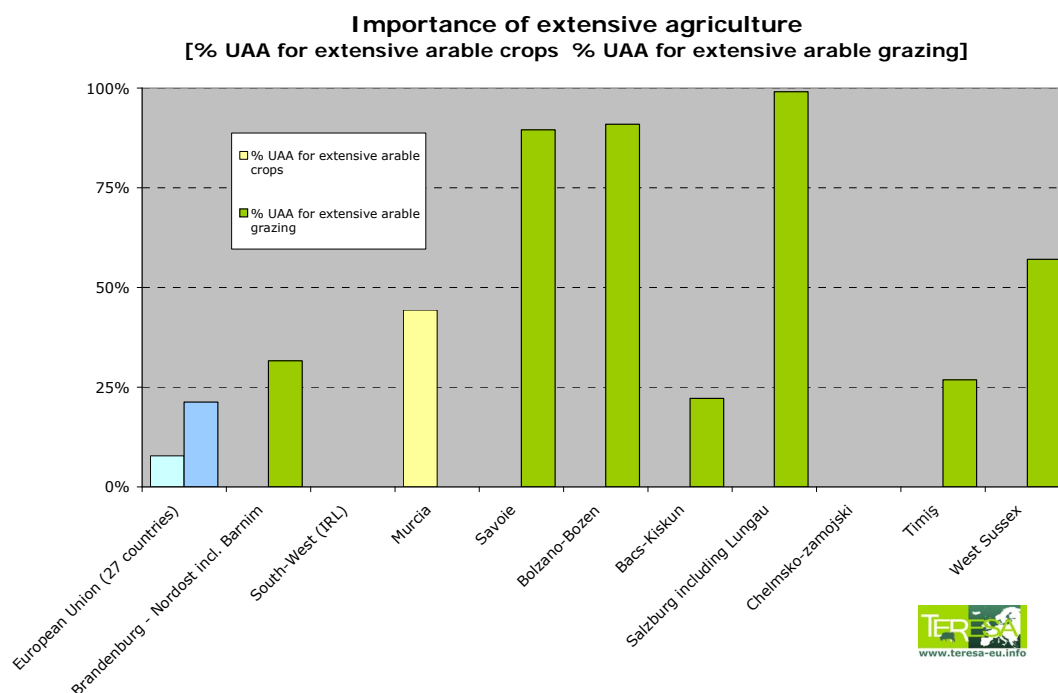
Definition: % UAA where cereals yield <60% of EU27-average; % UAA where livestock density <1LU/ha of forage area

Source: DG Agri 2009

Representative agricultural products, local specialities and specialised supply chain models will be presented in "The integration of agriculture into rural economy and society" chapter 2.4.

2.2.5   Overview

In the following Table 7, all previously described rural development factors get summed up for the eleven case study regions. In conclusion of this section of case study results the following could be noted:

There is a large variety of regional conditions and thus a large variety of ways in which agriculture can embed in the regional context (geographically, societal). Thus if we assume, that a thorough understanding of this embeddedness will lead to more effective steering of policy towards the specific needs of regions, a thorough knowledge of this variety – as depicted above – will be needed.

Also the evaluation regime of Rural Development Programmes – the Common Monitoring and Evaluation Framework (CMEF) calls for a thorough establishment of the baseline situation in the programming areas to establish territorial needs and consequently set programme objectives. However apart from the topographic and economic linkages between agriculture and other sectors, the links to society and the environment are of high importance and shall be covered in the following sections.

Table 7   Rural development status of the case study regions (qualitative summary)

case study region	analysis
Hedmark	
situation of the region	rural area with low urban influence, sparse population but rather close to the agglomeration of Oslo, low supraregional accessibility
natural value	many natural and semi-natural areas, forests and mountains of which many are protected
economic development	high economic power, high labour productivity, average importance of tourism
agriculture	limited preconditions, small but stable agricultural sector, small farm sizes, prevailing husbandry: intensive arable crops, forestry
West Sussex	
situation of the region	very urban countryside with high urban influence but only smaller cities, dense population, very highly populated catchment area (Greater London), good supraregional accessibility
natural value	naturally diversified, but intensively used area
economic development	high economic power, high labour productivity, average importance of tourism
agriculture	good preconditions, declining agricultural sector, large farm sizes, prevailing husbandry: mixed intensive arable crops and extensive pastures
Savoie	
Situation of the region	rural area but with a number of small and medium cities, however low urban influence, moderately dense population, moderate catchment areas, good supraregional accessibility
Natural value	Many natural and semi-natural areas, pastures, forests and mountains of which many are protected
Economic development	High economic power, high labour productivity, very high importance of tourism
Agriculture	Limited preconditions, declining agricultural sector, average farm sizes, prevailing husbandry: extensive pastures, forestry
Barnim	
situation of the region	intermediate to urban area on the outskirts of Berlin (large population in the catchment areas), high urban influence, densely populated, good supraregional accessibility
natural value	diversified landscape with forests, but large-scale arable cropping, many protected areas
economic development	low economic power, high labour productivity, low importance of tourism
agriculture	average preconditions, weak and declining agricultural sector, large farm sizes, prevailing husbandry: intensive arable crops, forestry
Chełmsko-zamojski	
Situation of the region	very rural area with low urban influence, moderately dense population, long travel time to reach larger agglomerations, low supraregional accessibility
Natural value	diversified landscape, but dominated by less diversified agriculture
Economic development	Low economic power, low labour productivity, low importance of tourism
Agriculture	Good preconditions, important but strongly declining agricultural sector, average farm sizes, prevailing husbandry: intensive arable crops
Murcia	
situation of the region	intermediate area with two larger cities (Murcia, Cartagena) and a rural remaining area, low urban influence but dense population, many people in the catchment area, moderate supraregional accessibility
natural value	diversified landscape with mountain and agricultural areas, attractive coastline
economic development	average economic power, high labour productivity, average importance of tourism
agriculture	good preconditions, strong and stable agricultural sector, average farm sizes, prevailing husbandry: mixed extensive arable crops and intensive permanent and horticulture crops

Table 8   Rural development status of the case study regions (qualitative summary continued)

case study region	analysis
Timiş	
situation of the region	intermediate to urban area with a large city (Timişoara), high urban influence, only moderately dense population and few people in the catchment area, low supraregional accessibility
natural value	naturally not very diversified landscape, dominated by agriculture
economic development	low economic power, low labour productivity, low importance of tourism
agriculture	good preconditions, important but strongly declining agricultural sector, small farm sizes, prevailing husbandry: mixed intensive arable crops and extensive pastures
Lungau	
situation of the region	very rural area without agglomerations, a very low urban influence that is sparsely populated, hardly urban regions in the 2-hour catchment area, medium supraregional accessibility
natural value	many natural and semi-natural areas, pastures, forests and mountains of which many are protected
economic development	average economic power, high labour productivity, high importance of tourism
agriculture	limited preconditions, strong and slowly declining agricultural sector, small farm sizes, prevailing husbandry: extensive pastures, forestry
Bolzano-Bozen	
situation of the region	rural area with some medium cities, no major agglomerations nearby, good supraregional accessibility
natural value	many natural and semi-natural areas, pastures, forests and mountains of which many are protected
economic development	very high economic power, high labour productivity, very high importance of tourism
agriculture	average preconditions, strong and stable agricultural sector, average farm sizes, prevailing husbandry: mixed extensive pastures and intensive permanent crops, forestry
Bács-Kiskun	
situation of the region	a rural area with one medium city (Kecskemét), generally low urban influence and moderately dense population, but proximity to the agglomeration of Budapest, medium supraregional accessibility
natural value	naturally not very diversified landscape, dominated by agriculture
economic development	low economic power, low labour productivity, low importance of tourism
agriculture	good preconditions, important but strongly declining agricultural sector, small farm sizes, prevailing husbandry: intensive arable crops
South-West (IE)	
situation of the region	rural to intermediate with one urban growth pole (Cork) that exerts a high influence, in total only moderately dense population, except for cork no major agglomerations nearby, low supraregional accessibility
natural value	dominated by diversified but intensive pastures, attractive coastline
economic development	very high economic power, high labour productivity, average importance of tourism
agriculture	average preconditions, declining agricultural sector, average farm sizes, prevailing husbandry: intensive pastures

2.3   Integration of agriculture into the environment

2.3.1   Significance of cultural agricultural landscape

Concerning the cultural agricultural landscape, most of the case study regions can be classified in two opposed groups.

First, there are regions where *arable crops dominate the rural landscape* up to 100%. The three transition regions Chełmsko-zamojski, Timiş, Bács-Kiskun can be found in this group. Agriculture is on one hand the dominating shaper of anthropogenic and natural habitats, on the other hand agriculture reduced a formerly diversified landscape, although plots are rather small-structured in these regions and extensive forms of husbandry are still relatively strong. It has to be stated, however, that there is no clear correlation between the transition status of the regions and the preservation of cultural landscape as this form of agriculture can be found in many Western regions, too.

The second group consists of the three mountain regions. In these areas, arable crops are of minor importance, but *semi-natural cultivated forests and pasture areas* and in Bozen-Bolzano and Savoie also permanent crops (wine, fruit trees) dominate the scenery (besides natural mountain areas). This makes for an very diversified and attractive – albeit to a large extent also man-made – environment for residents and tourists.

The other regions are more heterogeneous. The county Hedmark is divided between mainly natural mountain areas in the north and standard arable crops in the south, similar to Murcia. In Barnim, large-scale arable cropping is penetrated by many forest and other semi-natural areas. In West Sussex, the agricultural landscape is diversified but under strong pressure from urbanisation. In South-West Ireland, intensive pastures dominate the landscape rather than arable crops.

2.3.2   High nature value farmland

Visually attractive landscape is only one side of the coin as it does not yet automatically give a hint on the ecological value of these regions. The *High Nature Value Farmland in Europe* project (EC/JRC 2008) tried to develop a standardised European high nature value farmland assessment system based on CORINE land cover satellite data. This data does of course not consider local factors. But as can be seen in Map 3, the high nature value farmland correlates with the presence of grazing areas and the intensity of agriculture which is owed to the methodology based on CORINE data.

The aggregation of this data to NUTS 2 regions (EC/JRC 2008) shows this clearly (0): the Alpine regions have the highest share of high nature value farmland. According to the case study reports, in these regions there is also the highest emphasis on the conservation of biodiversity (e.g. via agri-environmental measures). Due to the fact that Norway is no member of the EU, there is no comparable data available for Hedmark.

Map 3   Preliminary distribution map of high nature value farmland in the WCE countries
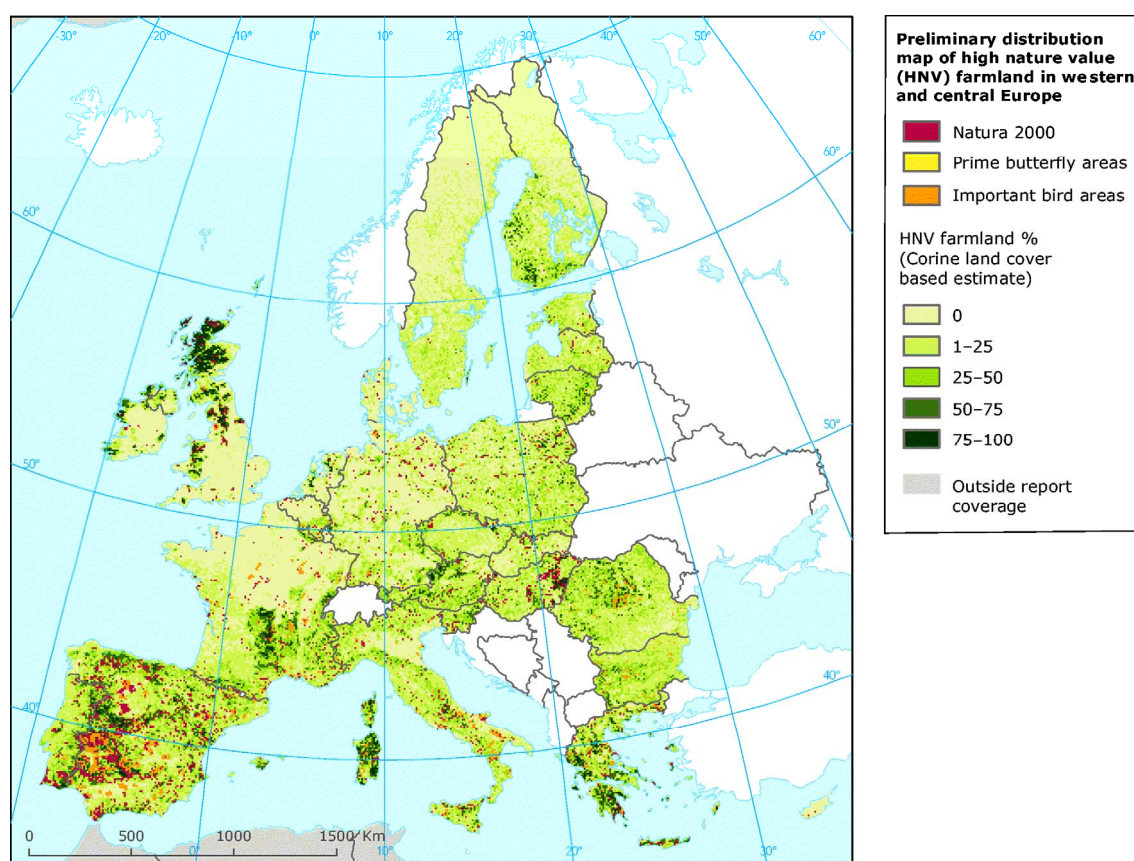
Source: European Environment Agency (image) based on European Commission, Joint Research Centre (JRC), 2008

Figure 17   Case study regions: Share of high nature value farmland in NUTS 2 regions

Share of high nature value farmland [% of agricultural land]
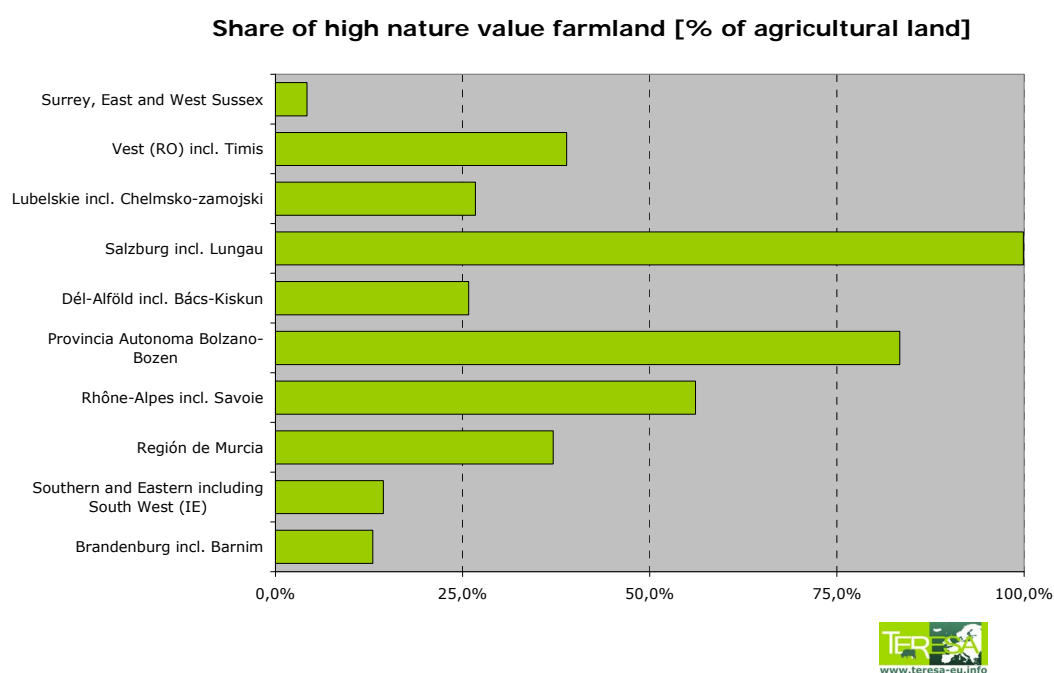
Source: European Commission, Joint Research Centre (JRC), 2008

2.3.3   Ecological farming systems

Another indication of the closeness of agriculture and the environment is the presence of organic modes of agriculture. In this purely human defined factor, the picture is much different from the exogenously driven landscape and habitat integration indices. The importance of organic production in the NUTS 2 regions of the case studies can be taken from 0. For instance, the alpine regions, that in principle have shared a high environmental focus, do have nothing in common anymore. While in Lungau, the share of organic production is as high as 60% (mainly Alpine dairy), Bozen-Bolzano and Savoie are even below EU15 average (in Bozen-Bolzano even extremely below the Italian average of 7.8% according to the EC DG Agri Rural Development Report 2008). Secondly, organic production is of over-average importance in the most urbanised areas (except for the transition countries) West Sussex, Barnim and Murcia. This affirms that organic production is much more consumer- than environmentally driven, or follows, as in the case of Lungau, a specific regional strategy.

Figure 18   Case study regions: Importance of organic production

Importance of organic production [% of UAA]
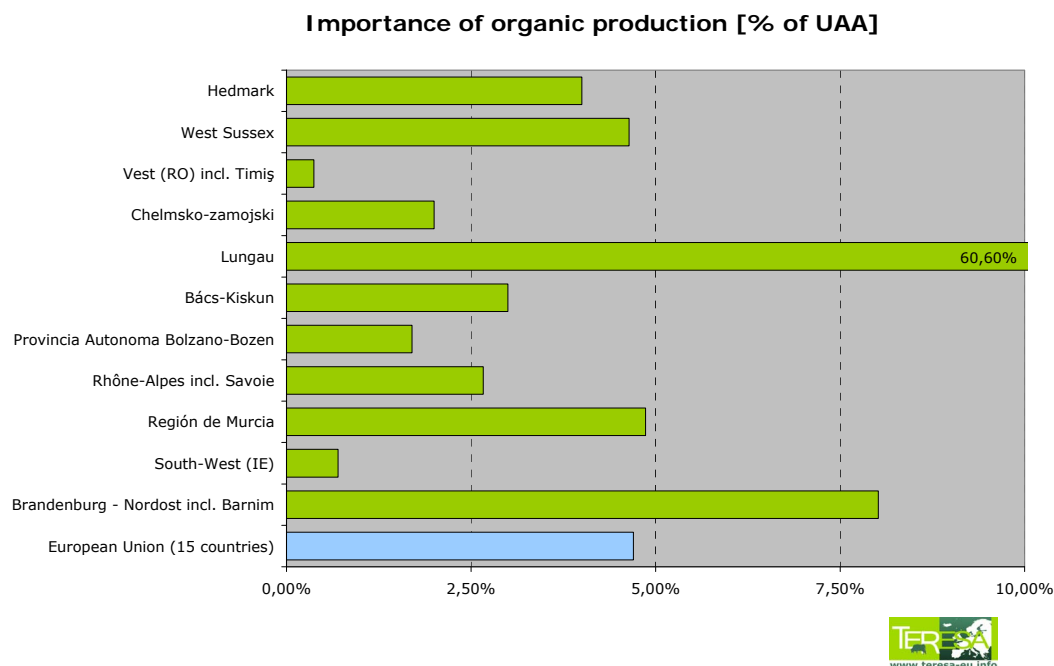
Source: DG Agri Rural Development Report 2008, case studies South-West (IE), Bolzano-Bozen, Bács-Kiskun, Lungau, Chełmsko-zamojski, West Sussex, Hedmark

2.3.4   Land use conflicts

Generally, in all European regions agricultural land gets converted into land for anthropogenic uses to a certain extent. However, special land use conflicts in the case study regions are very much dependent on two factors.

➔ The degree of ongoing urbanisation (urban sprawl) and/or the development tourism infrastructures causes conflicts between agriculture and other human land uses.

➔ The degree of productivity and profit of agriculture determines conflicts between agricultural and other human land uses (mostly natural areas).

Particular examples for the first case include West Sussex, South West (IE), Barnim and Murcia. In the case of West Sussex and Barnim, the urban sprawl of the nearby metropolises spread out over their territory and formerly agricultural land gets converted into building land. Around Cork, economic areas faced a strong growth in recent years. In Murcia, besides residential purposes, tourism facilities along the coastline got expanded on the cost of agricultural land. In the very rural regions and in the transition countries, this process is not (yet) very strong. The second case is found to a strong extent, again, in Murcia. Although much agricultural land gets urbanised there, on the other hand also intensive agricultural acreage gets expanded strongly (horticulture, permanent crops), basically on the cost of semi-natural and natural areas. So in Murcia there is a pressure exerted on and from agriculture. This phenomenon can be watched in many urbanised regions with favourable climate and soil conditions, but usually on a local rather than a regional level (e.g. some parishes in Sussex or the 'Marchfeld' region around Vienna).

2.3.5   Overview

In the following overview table, the integration level of agriculture into the environment gets subsumed for the eleven case study regions.

Table 9   Integration of agriculture into the environment in the case study regions (qualitative summary)

region	analysis
Hedmark	low significance of cultural agricultural landscape (mostly natural/semi-natural areas), high share of high nature value farm land, average but growing organic agriculture
West Sussex	average significance of cultural agricultural landscape (urbanisation), low share of high nature value farm land, average but growing organic agriculture, conflicts between agricultural and building land use
Savoie	high significance of cultural agricultural landscape (extensive pastures, wine growing), high share of high nature value farm land, underrepresented organic agriculture
Barnim	low significance of cultural agricultural landscape (large-scale arable crops), low share of high nature value farm land, important and growing organic agriculture, conflicts between agricultural and building land use
Chełmsko-zamojski	average significance of cultural agricultural landscape (small-structured arable crops), average share of high nature value farm land, underrepresented but growing organic agriculture
Murcia	mixed significance of cultural agricultural landscape (extensive arable crops and intensive permanent crops and horticulture), high share of high nature value farm land, important organic agriculture, conflicts between agricultural and (residential) building land use and agricultural land use on the cost of natural land
Timiş	low significance of cultural agricultural landscape (uniform landscape), high share of high nature value farm land, underrepresented organic agriculture
Lungau	high significance of cultural agricultural landscape (extensive pastures, fruit and wine growing), very high share of high nature value farm land, very important organic agriculture
Bolzano-Bozen	high significance of cultural agricultural landscape (extensive pastures), very high share of high nature value farm land, underrepresented organic agriculture
Bács-Kiskun	low significance of cultural agricultural landscape (uniform landscape), average share of high nature value farm land, underrepresented but growing organic agriculture
South-West (IE)	high significance of cultural agricultural landscape (intensive pastures), low share of high nature value farm land, underrepresented organic agriculture, conflicts between agricultural and economic land use

2.4 The integration of agriculture into rural economy and society

In order to increase their income, farmers follow different strategies which are generally all associated with a certain level of integration with other subjects than conventional agriculture. The following will orient itself along the three dimensions by Van der Ploeg (et al. 2002) – deepening, broadening and regrounding – that were already presented in chapter 1 "Background of the study" and will provide examples from the case studies of all three dimensions. A useful illustration of various specifications of these strategies is illustrated in Figure 19.

Figure 19   Farmers' strategies to obtain additional income
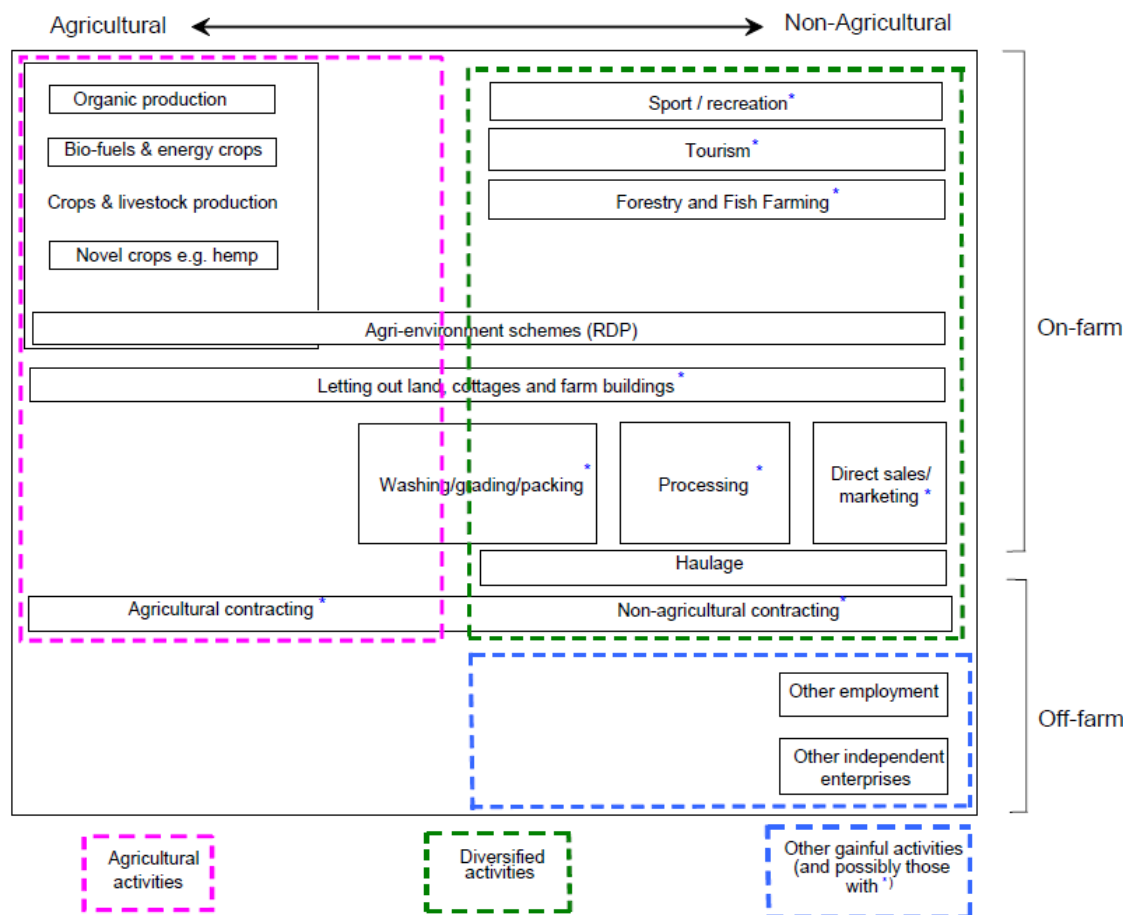
Source: DEFRA (2007)

2.4.1 Deepening: differentiating production

The main task for investigating this strategy was the analysis for the most relevant and representative agricultural supply chains in the regions as was already mentioned in the introduction to this chapter. Major evidence for a high level of deepened agricultural activities in the sense of TERESA is the presence of:

➔   The *orientation towards specific products* which would mean the expansion of organic farming practices, the orientation towards higher quality products,

the development and/or consolidation local/regional labelled specialties, or the fulfilling of specific consumer demands;

➔ The *improvement of existing standard products* in terms of marketing – local, national or export markets, the better integration into local supply chains, for instance via common marketing activities or the attachment of special geographical attributes to otherwise interchangeable products.

The supply chains were already classified for the case study selection process (see deliverable "D 2.2 STANDARDISED DESIGN FOR THE CASE STUDIES", part A, chapter 2.3.1) using this basic typology:

Figure 20   TERESA typology of agricultural supply chains
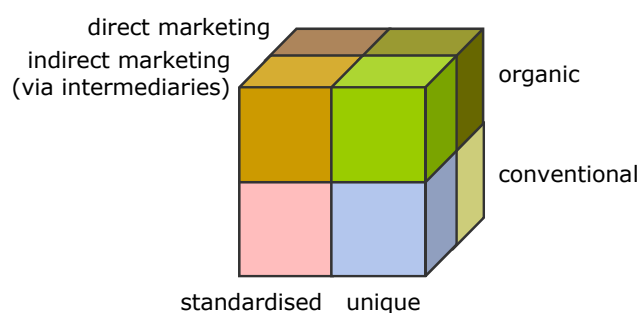
Source: Beiglböck et al. (2007)

Typical for nowadays deepened activities are the combinations including either organic farming, the production of unique (differentiated) products or direct marketing activities (or a combination of one to three of these). According to the strategies of differentiating production (deepening section in the background chapter 1), these types are split into the following categories:

A Specific products have an extended focus on differentiation:

➔ A1 traditional and typical products (non-exchangeable origin labelled products)
➔ A2 products identified by their territory (but exchangeable)
➔ A3 consumers-driven products (conventional and organic)

B Standard products are differentiated on a lower level:

➔ B1 standard products of local consumption
➔ B2 standard products with geographical attributes for the consumers
➔ B3 standard products with a regional or national market
➔ B4 standard products with an international market

Table 10 gives an overview of the supply chains analysed in the case studies allocated to these types. There has been a first round with detailed data on existing and representative supply chains and an "alternative" round with less detailed information on supply chains that are less important nowadays but could be realistic future possibility for the farmers. This typology will be short-circuited with the types of rural development explained earlier in this report in chapter 3.4.1 "Types of supply chain and regional development" in order to identify different types of contribution of supply chains to rural development.

Table 10   Typology of supply chains analysed

type	supply chain	region	product characteristics/ production system	marketing system
A1	Schnaps liquor	Lungau	unique	direct
	Beaufort cheese (FR)	Savoie	unique	indirect (+ direct)
	Speck smoked ham	Bozen-Bolzano	unique	indirect
	Wine	Bozen-Bolzano	unique	indirect
A2	Apples	Bozen-Bolzano	unique	indirect
	Synnøve cheese (NO)	Hedmark	standard	indirect
	Hop for "Perla" beer	Chełmsko-zamojski	unique	indirect
	Local cheese (UK)	*West Sussex*	*unique*	*indirect (+ direct)*
	Labelled pork (ES)	*Murcia*	*unique*	*indirect*
A3	Brodowin milk (DE) organic	Barnim	unique + organic	indirect (+ direct)
	Wood (DE)	Barnim	standard	indirect
	Goat cheese (FR)	Savoie	standard	direct
	Packaged salad (UK)	*West Sussex*	*standard*	*indirect*
	RAFT tomatoes	*Murcia*	*unique*	*indirect*
	Packaged salad (ES)	*Murcia*	*standard*	*indirect*
	Energy wood (AT)	*Lungau*	*standard*	*indirect*
	Organic apples	*Bozen-Bolzano*	*unique*	*indirect*
B1	Milk (PL)	Chełmsko-zamojski	standard	indirect
	Cereals (RO)	Timiș	standard	indirect
B2	Milk (FR)	Savoie	standard	indirect
	Beef	South West	standard	indirect
	Butter for export	South West	standard	indirect
	Lettuce (UK)	West Sussex	standard	indirect
	Milk (UK)	West Sussex	standard	indirect
B3	Milk (AT)	Lungau	standard	indirect
	Pork (ES)	Murcia	standard	indirect
	Maize for feedingstuffs	Bacs-Kiskun	standard	indirect
	Pork (HU)	Bacs-Kiskun	standard	indirect
	Sunflower oil	Bacs-Kiskun	standard	indirect
	UHT milk (NO)	Hedmark	standard	indirect
	Rapeseed (PL)	Chełmsko-zamojski	standard	indirect
	Milk (RO)	Timiș	standard	indirect
	Pork (RO)	Timiș	standard	indirect
	Milk (NO) fresh	*Hedmark*	*standard*	*indirect*
	Rapeseed (UK)	*West Sussex*	*standard*	*indirect*
	Milk (DE) conventional	*Barnim*	*standard*	*indirect*
B4	Wood (AT)	Lungau	standard	indirect
	Lettuce (ES)	Murcia	standard	indirect
	Tomatoes	Murcia	standard	indirect
	Mussels	South West	standard	indirect
	Wheat	West Sussex	standard	indirect
	Sweet corn	*Bacs-Kiskun*	*standard*	*indirect*

Notes: The second round of "alternative" supply chains is written in italics. Due to the heterogeneity of the products included, the Barnim supply chain *seeds* ("Märka") was not included in this table.

Examples for differentiating towards traditional and typical products

Origin labelled and regional flagship products are often seen as an important drivers and key measures in rural development concepts development and offer the following perspectives (Groier 2007):

➜ They increase the awareness of consumers to regional farming and food specialties;

➜ They secure and develop regional agriculture through product differentation, opTimişation the value chain of agricultural products, diversification of production thus increasing the regional value;

➜ They dynamise rural development through networking and collaboration along the agrarian supply chains (especially with gastronomy, tourism and local sales);

➜ They strengthen the regional identity and image of the region and raise the profile of typical regional flagship products.

Some accurate examples can be found in the case studies:

The *Beaufort cheese* from Savoie is a particular good example for the cooperation nature of quality labelled products. During the middle of sixties, several farmers began to consider that it was time for a new type of organisation. They developed a strategy based on quality and opposite to productivity model. The quality of Beaufort should justify a higher price that supported the extra costs of agriculture in the high mountain regions. The revival of Beaufort was based on cooperation systems for processing and retailing (creation of The Union of Beaufort Producers), quality of product and use (and valorisation) of local resources, and the willpower to improve their knowledge to manage the production (creation of a technical department working with different research organisms.

In Bozen-Bolzano, the locally smoked and cured ham called "*Speck*" is a very well known in all over Italy and the German speaking countries. It carries a *PGI*[5] instead of a *PDO* label[6] the reason for which is probably that all the raw meat used in industrial production is imported. Currently 5.5 million of hams are produced although there are only about 25.000 pigs in the area. Only for producing the artisan "Bauernspeck" pigs grown up in South Tyrol are processed. Nonetheless, this quality product is very much identified with the territory and loved by tourists as well as by gourmets abroad.

Examples for differentiating towards products identified by their territory

These supply chains show similarities to the A1 type, but the products are no products of great tradition or differentiation, but still the local brand makes it attractive for consumers in- and outside the region. As consumer-driven local specialities, these are somewhat a combination of the A1 and A3 types.

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[5] Agricultural products and foodstuffs closely linked to the geographical area. At least one of the stages of production, processing or preparation takes place in the area.
[6] Covers agricultural products and foodstuffs which are produced, processed and prepared in a given geographical area using recognised know-how.

An emerging supply chain in West Sussex is the *local production of cheese*. It is partly driven by a project called '*The Taste of Sussex*', which has created as a regional brand for a variety of local products although not being an internationally recognised label. So far, only 1% of total milk production in West Sussex is used for local cheese making. These undertakings are nonetheless all very profitable and are very successful on local markets and in local retail chains.

The *South Tyrolean Apple* in Bozen-Bolzano is the main important agricultural product. About 8.000 farmers are cultivating 18,000 hectares and harvest nearly 1 million tons of apples. That comes up to the total production in Germany and hence every 7th apple consumed in Europe was produced in South Tyrol. As typical for Alpine regions the processing and marketing of agricultural products is organized in cooperatives and are therefore very well networked. This allows them to deliver large quantities of a standardised and nonetheless specific product to the international markets.

Examples for differentiating towards consumers-driven products

The value-added chain of *Brodowin organic milk* can be presented as an exemplary value-added chain for the development of organic agriculture and for the processing and marketing of organic products in the eastern German region of Barnim. The basis of this value-added chain is the Brodowin organic village, an agricultural complex producing and processing raw milk with another agricultural operator as a partner. The specially founded marketing company markets 20% of the products directly to end consumers in two farm shops and through subscription boxes. In neighbouring Berlin, organic food sales have increased by about 20% over the past three years, and this although regional incomes are just 80% of average national incomes. This fact can be explained through consumers' growing awareness of health issues, regionality and sustainable business cycles, so priorities shift within the incomes earned. According to a current study, 90% of all purchasers of organic foods throughout the region have heard of the Brodowin organic village.

The future and consumer-driven development of lettuce production as well in Murcia as in West Sussex is at least in parts the greater adoption of *prepared packaged salad* processing. These are pre-washed, cut and packaged ready for consumption. The opinion of some experts stress that the proximity of the firm to the final market is an important factor to take into account in the localisation of factories – according to this point of view, it is more likely that new establishments offering these products would be established near big agglomeration. Near London, according to the West Sussex case study, the growth for fresh lettuce is almost exclusively in ready-prepared vegetables and salads. Nature's Way Foods, a pre-packaged salad producer in West Sussex, was the highest growing firm in the UK in 2005. The success of UK prepared salads, in contrast to experiences in the US, is largely due to the efficiency of the supply chain. In the UK, prepared salads will be in the retail store within two days of harvest and consumed within five days of harvest – half the time which salad spend in transport and inventory in the US.

Already 15% of the local *wood production* in Lungau, that has a long and important tradition in the production of construction wood, is directly available for energy use. Also in the medium and long term future expectations on the economic progress of

wood are very good due to an intensified use of wood in the energy sector and the growth of fossil fuel prices. In Lungau several district heating plants have been built in the last few years based on wood, there is as well a large number of private heating systems (pellets) in the region. A study on sustainable energy provision in Lungau assumes that the share of biofuel heating systems of the household supply will increase from 55.1% in 1998 to 77.2% in 2010.

2.4.2   Deepening: short supply chains

This strategy for the farm entrepreneur means to acquire functions down the line from production to achieve a higher value added to his primary products. The two basic activities that can be subsumed under this lable are on-farm processing and direct sales to the end customer, either on farm, on (local) markets or by shipping, whereas the last option is usually only exercised with high-value goods such as wine. The case studies provide a number of significant examples for shortening supply chains.

Perhaps the most interesting one is the *Schnaps* production in Lungau. Schnaps is a traditional liquor (originally) made from home grown fruits and berries in Alpine regions. A lot of farmers in Lungau (around 200) are still busy in distilling on average 20 litres of Schnaps every year for their own good. The two interviewees from the case study are the two farmers in Lungau who have professionalized Schnaps distillery. In both cases it was once a hobby and then developed into the main branch in both farms. Due to a rather harsh climate a high percentage of the raw products for professionalized production is now imported.

Figure 21   Lungau supply chain Schnaps
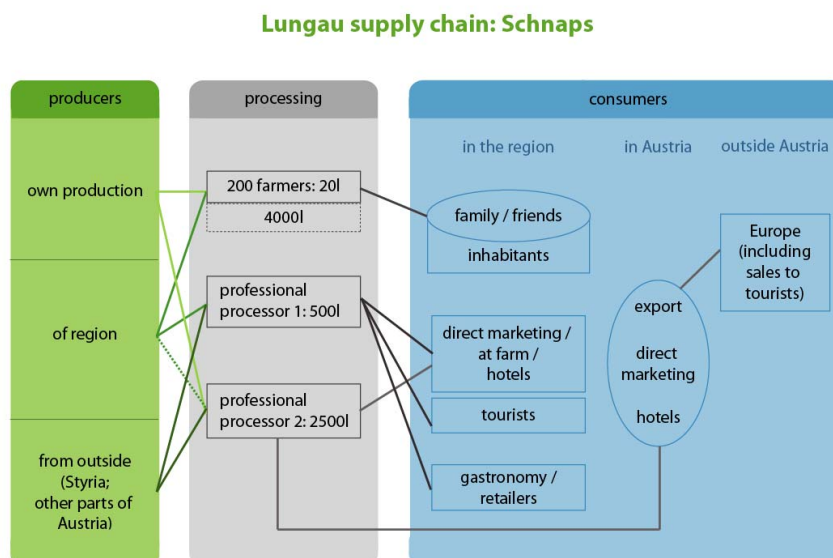
Marketing strategies of the two farms are quite different though they both concentrate on direct marketing. One family sells their products on the regional market with only minimal export quotas. About 50% of the costumers are end-consumers. The costumers visit the farm, taste and buy Schnaps in Moser's tasting room (and other self made products from the farm). Gastronomy and regional

grocers are the intermediaries for the rest of the production. The other family sells 98% of their products directly to the end-consumers, a high percentage via Schnaps tasting in various hotels in Austria and abroad and other marketing activities in different regions (exhibitions, etc.).

Another example would be the *production of cheeses* in Savoie in the French Alps. Goat cheese is produced, processed and, in most cases, exclusively sold by farmers directly. In the case of the Beaufort cheese (AOP), farmers more often join forces in the form of permanent cooperatives (*cooperative à gestion directe*) who sell, again, large portions directly to the end consumer.

2.4.3   Broadening: diversification activities

As was already mentioned in the introducing chapter 1, diversification in Agriculture is not always clearly defined. In the TERESA case studies we tried to capture the classic diversification strategy of farmers enhancing their income from sources other than conventional farming production (DEFRA 2007) in a broader sense to include everything that is either non-agricultural or primary production such as forestry and fishing. We therefore included, amongst other factors, the regional wood processing industry, bioenergy producers, rural tourism, landscape management (in an economic sense) and crafts and other diversified on-farm activities into the analysis.

The classic diversification strategy of farmers occurs, according to research (EC DG Agri 2008), more frequently on (economically!) large holdings (while pluriactivity is mainly a feature of small farms). Additionally, the size of the farm also influences the type of activity set up, with small farms developing the processing of agricultural products, and larger ones contractual work. Furthermore, the type of farming is relevant, as activities that are more labour intensive than others usually require a constant presence of the farmer. As a consequence, regions concentrating in livestock may be more inclined towards on-farm diversification. On-farm tourism is therefore mainly linked to farms specialised in grazing livestock. These farms are often located in places that are attractive for tourism as e.g. mountain areas, coastal areas or other types of pleasant countryside, which is the main advantages to attract potential clients. (EC DG Agri 2008).

Diversification in West Sussex is already well developed if compared with the rest of the UK. These include most commonly the letting of buildings for tourism and recreation. But frequently, it also means letting buildings to small business (i.e. carpentry, light industry). Although county data is not available, it is possible to get an indication of the widespread practise of diversified enterprises in the area considering South East data. DEFRA estimates that in the South East, around 73% of farms practice diversification, of which letting out buildings for non-agricultural use is the most common option. Farm income from diversification was 46% in 2005/6, which is by far the highest of all English regions. The South-East has the highest level of diversification but the lowest level of farmer/spouse off-farm employment. One very interesting example are two farms in the regions, who fully specialised in the on-farm entertainment of children.

Another unusual diversification strategy are the approximately 40 mussels farms in the South West of Ireland. There is an average of three to four persons per farm, 50% of farms are between 10 to 50 hectares. The average farm size is 15 ha. The average turnover is €150,000. Many of the producers were on-land farmers who saw an opportunity for farming in the sea. Others were and are still fishermen.

In Austrian Lungau a lot of non-agricultural employment opportunities are long linked in more or less tight way to agricultural (and forestry) activities. Besides tourism which accounts for the majority of these activities, on-farm processing of farm produce (meat, cheese, fruits etc.) and direct marketing activities are the most important ones. There are some farmer markets regularly in the region, and a series of other small marketing groups and individual farm diversification activities. But tourism is a particularly important activity for nearly half of the farms in Lungau. Though only part of the farms are registered within the association of farm tourism, about 450 farms offer beds and apartments for tourists. The main opportunities are seen in the attractiveness of the area for "soft tourism" which includes specific packages for nature oriented tourism (in close relationship to the National Park Hohe Tauern), and the orientation towards particular target groups, like families with children, school groups and older persons seeking tourism resorts off the main intensive tourism centres.

2.4.4   Broadening: the role of agriculture in society

Rural areas are associated with notions of "culture," "tradition," and "identity." These notions are perceived as a positive, indeed an essential, good. However, agrarian communities have undergone dramatic transformations. For example, labour migration to cities and linkages to these centres have major impacts on rural incomes and resources. The importance of their social function becomes evident when considering rural areas in Western Europe, which have only modest direct importance for employment and national revenues, but taking into account the need to maintain the basic services and economic opportunities needed to keep rural areas attractive to community members, a living countryside is viable for rural areas (cf. FAO 1999).

Thus, the development of regions not only depends on a region's natural, environmental and physical preconditions but also on the characteristics of persons and organisations and their interrelations. Consequently, within TERESA the social networks have been assessed in the case study regions in order to analyse the influence on the development of the regions. In the 11 case studies 153 social actors have been identified (Figure 22).

Figure 22   Case study regions: Actors analysed
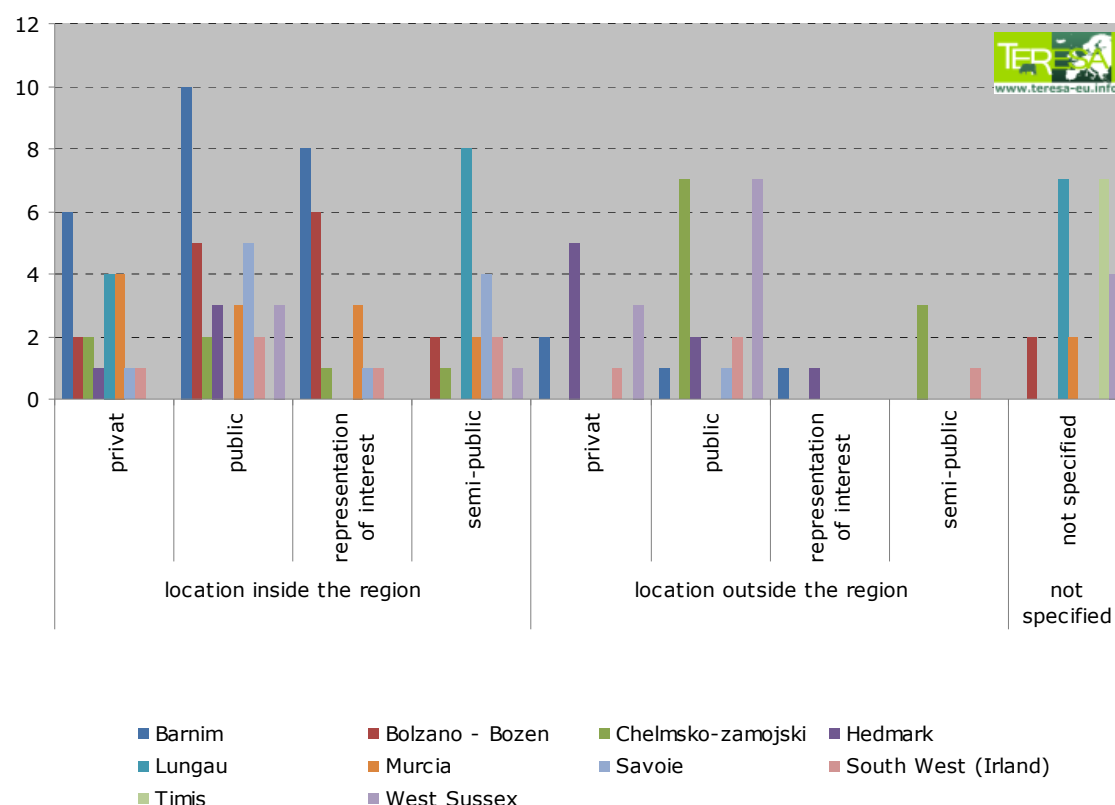
A problem all case study authors were very much facing was the lack of data on social relations. Except for basic demography, education and labour market statistics, there are hardly any social networking indicators to obtain on a NUTS 3 level. One of the only comparable dates on this topic are the number of LEADER+ local action groups in the regions which can be taken from Table 11. Its evidence is also limited, as no information on the population covered was obtained and the accession countries did not fully take part in the LEADER+ programme, but generally one can say that in more peripheral regions the interest in this local government initiative is the strongest.

Table 11   Case study regions: Number of Leader+ local action groups

case study region	Hedmark	West Sussex	Savoie	Barnim	Chelmsko-zamojski	Murcia	Timiş	Lungau	Bolzano-Bozen	Bács-Kiskun	South-West (IE)
local action groups	--	1	2	--	2	4	--	2	5	6	5

Source: case studies, ec.europa.eu/agriculture/rur/leaderplus

In West Sussex, numerous groups can be found spanning a wide array of activities. These can have a formalized status like associations, unions or charities, but are also less formal like local/parish partnerships and action groups. Almost every district in West Sussex has more than one action group engaged in the pursuit of environmental, regeneration and other matters. Agenda 21 groups were initiated

eight years ago with the purpose to support rural communities in West Sussex. Once the project funding terminated the Agenda 21 groups witnessed a transformation into parish action groups. The latter account to around 150 in West Sussex. For agriculture and rural development, relevant unions and special interest groups play an important role towards policy-making. These groups often represent specific interests and are included in policy consultations. The preparation of the Rural Development Programme for England 2007-2013, submitted by Defra, has seen the contribution of 179 (!) non-governmental organizations.

Civil society exerts an influence on the Barnim's development as an economic, social, cultural and ecological place. The locals have formed several non-profit organisations with the aim of improving life in Barnim and civil society is taken into consideration in politics and planning. Large projects and development plans usually have to involve civil society by law. The involvement of civil society also can be seen in regional management, where locals developing economical ideas and concepts can receive support. Networking within regional management also helps the locals to act together. The regional parks of Barnim, the "Naturpark Barnim" and the "Barnimer Feldmark", are also based on the bottom-up principle. A non-profit organisation was founded, which members are composed of representatives from politics as well as from civil society.

The region of Chełmsko-zamojski is characterised by a significant social activity, when seen against the average Polish background, despite a very low index of urbanisation. There are, in the region, 21.3 social associations and organisations per 10,000 inhabitants, while the average for Poland is 18.6. A very important influence on the condition of agriculture in any region is exerted by the institutions established either by the agricultural producers themselves, or by other entities, these institutions meant to help producers on matters of promotion and sale of their products.

The civil society in Murcia is predominantly centred on economic, cultural and/or recreational associations. As a speciality, PRODER is a Spanish program included in the Rural Development Plan of each region that follows the LEADER philosophy. The PRODER programme was set up for the rural municipalities not included in LEADER initiative.

The district of Lungau is a comparably small region with natural borders of high mountains. From a social point of view inhabitants perceive Lungau as a very specific and peripheral region with its own mechanisms and rules. Interviewees often refer to the "tiny extension" of the region with the consequence that all the relevant actors "know each other" very well although they do not necessarily communicate with each other. In Figure 23 you can find a schematic graph of the relationships of the social actors in Lungau indicating the relevance and linkages of a great number of relevant actors and institutions.

In Bozen-Bolzano (South Tyrol) over 1,100 associations and clubs exist. The range is very broad an encompasses a large number of associations with social, political and cultural background as well as associations with voluntary activities.

Figure 23   Institutional actors in Lungau
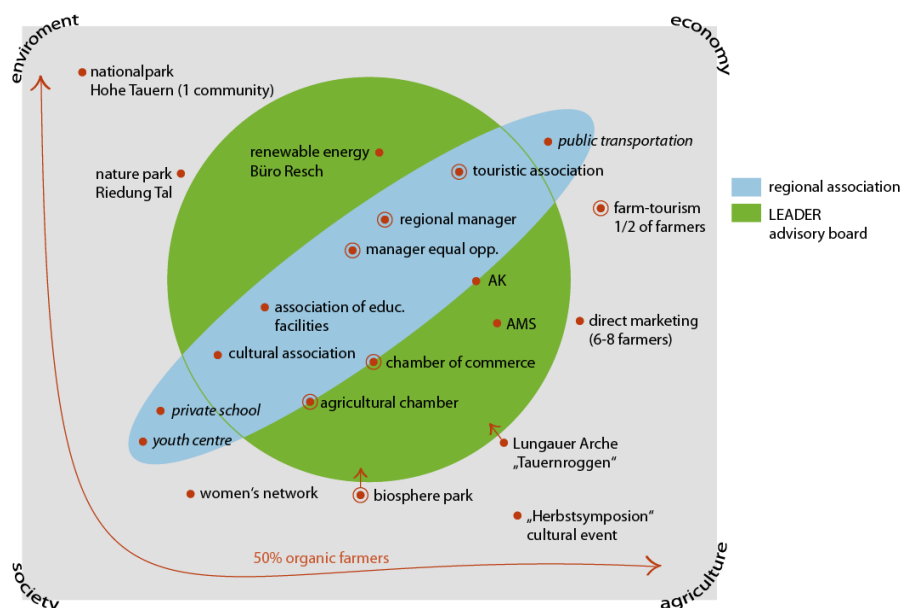
2.4.5   Regrounding: pluriactivity

Pluriactivity of farmers does basically not require a higher level of integration. Nonetheless, a short review will be given on this very important income source for European farmers. The possibilities of regrounding the farmers' activities do much depend on exogenous factors. Farmers located in predominantly urban areas usually have more employment opportunities than farmers located in predominantly rural areas: 37.5% of farmers living in PU regions are pluriactive, against 34.8% of farmers living in PR regions. (EC DG Agri 2008)

Figure 24   Distribution of family farm managers with other gainful activities and potential gross value added by classes of economic size – EU-27 – 2005
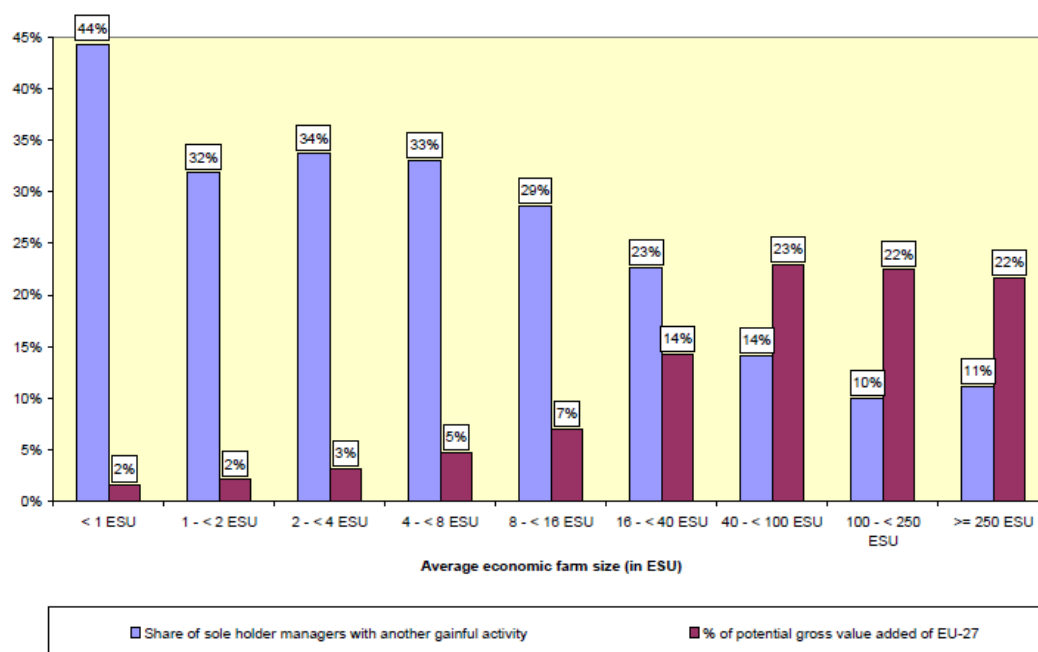
Source: EC DG Agri (2008)

Looking only at the TERESA case studies, one cannot clearly confirm the correlation between farm sizes and pluriactivity as discussed before in chapter 2.4.3. The regions with the largest economic farm sizes, Barnim and West Sussex, and the accession countries with their high importance of semi-subsistence farming have a comparatively low share of full-time farmers of 2-26%.

The regions that have a high importance of livestock grazing – Savoie, Lungau, Bolzano-Bozen and South-West (IE) have a share of full-time farmers between 34 and 58%. What cannot be confirmed by the case studies neither is, that in regions with a dynamic economic development in the secondary and/or secondary sector – in the case study regions Timiş, West Sussex and and South-West Ireland (cf. Table 12) – the share of pluriactive farmers is higher than elsewhere.

Table 12   Case study regions: Share of full-time farmers

case study region	Hedmark	West Sussex	Savoie	Barnim	Chełmsko-zamojski	Murcia	Timiş	Lungau	Bolzano-Bozen	Bács-Kiskun	South-West (IE)
Share of full-time farmers	26%	17%	38%	26%	15%	14%	2%	34%	51%	8%	58%

Source: Eurostat regional statistics (2005), case studies (Barnim: value for the Federal State of Brandenburg, NUTS 1).

2.4.6   Regrounding: mobilisation of resources

Pluriactivity does not automatically require a higher level of cooperation but in the sense of cost reduction we would also like to add a closer cooperation within the agricultural sector to this section (mobilization of resources, e.g. joint management of plots, cooperatives; cf. chapter 1). There are some very interesting examples in the case study regions, some more traditional, some more recent. The illustrations do not contain any judgements on monopolistic or oligopolistic structures, they just give an impression how joint forces can contribute to a stable farming sector.

For instance, typical for South Tyrol is the highly developed traditional cooperative system. These networks and syndicates compose the stable framework of South Tyrol's economic power. Mainly in the agricultural area efficient structures have been applied for linking the production closely to the processing and marketing steps of agricultural goods. Compared to the number of farms and the utilized agricultural area among the Alpine regions and even on the European level, the agrarian-sector in South Tyrol remains quite stable.

In Savoie, a particularity of *Beaufort supply chain* is cooperation. Two interprofessional unions are present on the supply chains: The "Union of Beaufort Producers" brings together cooperatives from the Beaufort zone, which produce 75% of the tonnage. The U.P.B. has established a technical department open to all (cooperatives and others), financed by a subscription by kilo of milk transformed. And, the "Syndicat de Défense du Beaufort", created in 1975, aims to bring together dairies and milk producers. It is particularly interested in collective

promotion and in the management of the AOC. The Beaufort supply chain proves to be very stable.

Traditionally, Hedmark farmers, as all Norwegian farmers, have been, and are, very well organised. Most farmers belong to a farmers' union, and they are also organised within national or regional cooperatives both on their input and output side. Atomistic farmers, in other words, appear united and are very strong participants in different networks on the national, regional and local level. Since they are organised in this way, they also appear to have (near) monopolistic market power in many markets. This is probably one of the reasons why agriculture still is highly regulated in Norway, while at the same time most other forms of industrial regulations (at least subsidies) have vanished during the last 10-20 years. Farmers have also established cooperatives for many of their market oriented activities. In the case study, it was pointed at Tine's strong position as the distributor of milk and regulator of milk production and milk prices. Tine is a farmers' cooperative, to which (almost) all milk is delivered from the farmers at a given price. At the same time, Tine produces dairy products. The selling price from Tine (the distributor) to Tine (the producer) is, of course, set at the price Tine wants. Dairies outside the Tine system, like Synnøve Finden (supply chain analysed), have to pay the same price.

On the territory of Chełmsko-zamojski there exists quite an extensive network of the branch associations of farmers (first of all producers of sugar beets and legumes and bee-keepers), which help the farmers on a very broad range of matters. Thus, for instance, the "Association of the Bee-Keepers of Roztocze", side by side with the matters connected with solving the problems of the bee-keepers owning small private apiaries, runs a production plant employing 30 persons. This plant deals with production and distribution of honey over the country, and also with the export of honey abroad.

2.4.7   Overview

In the following overview table, the integration level of agriculture into rural economy and society gets subsumed for the eleven case study regions.

Table 13   Integration of agriculture into rural economy and society in the case study regions (qualitative summary)

case study region	analysis
Hedmark	very strong role of agriculture due to powerful policy interventions, therefore mainly an economic dimension (no major diversification activities required).
West Sussex	high regional and farm diversity level (agricultural and non-agricultural), strong economic dimension (distinct entrepreneurial spirit, many consumer-driven products)
Savoie	high regional but low farm diversity level, strong integration into economy and society in connection with Alpine land management (important for tourism), strong cooperation patterns within the agricultural sector (cooperatives)
Barnim	high regional but low farm diversity level, integration into economy and society in connection with land management is getting stronger, but generally links are weak (except for the outstanding organic farming activities)
Chełmsko-zamojski	very low regional and low farm diversity level (transition country), no major integration of agricultural activities into economy and society (except for arable land cultivation), strong cooperation patterns within the agricultural sector (cooperatives)
Murcia	high regional but low farm diversity level (very competitive agriculture), strong economic dimension (employment, many consumer-driven products), severe conflicts for land and water resources between agriculture, environment and society.
Timiş	medium regional and low farm diversity level (transition country, industry is booming), no major integration of agricultural activities into economy and society (except for arable land cultivation), weak cooperation patterns within the agricultural sector
Lungau	high integration into economy and society in connection with Alpine land management (important for tourism), very important agrotourism, but generally a low regional diversity level
Bolzano-Bozen	high regional but low farm diversity level, very strong role of agriculture due to powerful policy interventions, very high integration into economy and society in connection with Alpine land management (important for tourism), very important agrotourism, strong cooperation patterns within the agricultural sector (cooperatives)
Bács-Kiskun	low regional and low farm diversity level (transition country), but relatively strong integration of agricultural activities into the economy (food industry), weak cooperation patterns within the agricultural sector
South-West (IE)	high regional and low farm diversity level (competitive animal husbandry), high integration into economy and society in connection with pasture management (important for tourism)

2.5   The role of policy intervention

2.5.1   Political and administrative potency of the regions

In only three of the case study regions political decisions are taken. Almost all regions (but for Chełmsko-zamojski) do exert administrative duties, with Murcia and Bozen-Bolzano also having CAP programming and administrational tasks.

Table 14   Case study regions: political and administrative level

case study region	political region	administrative region	CAP adminis-trative level	statistical region
Hedmark	X	X		X
West Sussex		X		X
Savoie	X	X		X
Barnim		X		X
Chełmsko-zamojski				X
Murcia	X	X	X	X
Timiş		X		X
Lungau		X		X
Bolzano-Bozen	X	X	X	X
Bács-Kiskun		X		X
South-West (IE)		X[x)]		X

[x)] two administrative regions

Murcia and Bozen-Bolzano are also in general the most autonomously organised federal regions of the selection.

In South Tyrol, besides some explicit support schemes for the fruit and wine sector, several other support activities and interventions of regional rural policy exist. These are supports concerning the farmers' properties ("Förderung des bäuerlichen Eigentums"), supports for construction activities ("Förderung des Bautätigkeit in der Landwirtschaft"), promotions for purchasing agricultural machines ("Begünstigungen beim Ankauf von landwirtschaftlichen Maschinen"), the support schemes of the EU-structural funds ("Förderung über die EU-Strukturfonds in der Landwirtschaft") and supports in case of emergency and bad weather damages as well as support of consulting activities ("Förderung bei Notfällen und Unwetterschäden sowie Unterstützung des Beratungswesens"). For other sectors (milk, pasture, forestry) further special contributions and supports exist.

But also in the non-Member state Norway there are strong policy interventions. Therefore also Hedmark's agriculture sector is heavily regulated. Traditionally, a detailed system of production subsidies, production quotas, import regulation, investment support, price regulations and guarantees of minimum income levels for farmers have been important regulatory measures. Liberalisation of world trade on the other hand, has influenced the use of measures significantly for the past 10-20 years. The income guarantee has been removed. Multifunctionality of agriculture, especially cultural landscape, rural development and quality of produce has, just as in the EU, become increasingly important. But subsidies to agriculture have not decreased in money terms. Agriculture still receives a notable share of the government's budget (NOK 10-20 billion, depending on how to calculate the sum), which probably implies that the income goal still is important although it was banned in the early 1990ies. In addition to these support schemes, the farmers have owned cooperatives that have sold the products to the market. They have been monopolies, and they have been important instruments for the government in

regulating consumer prices. Their strong position is now being challenged by other producers, and by very strong chains of wholesalers and detailers.

2.5.2 Significance of different types of rural development interventions

Obtaining information on 1st pillar agricultural subsidies is still very hard to obtain, in many cases not at all. Although after the case studies were finished Member State websites providing information on single beneficiaries of CAP payments (shared management) under Article 44a of Council Regulation (EC) No 1290/2005 as amended by Council Regulation (EC) No 1437/2007 and Commission Regulation (EC) No 259/2008 went online, they are normally not computable for aggregation on a regional level. Therefore, the allocation in Table 15 has to stay a mixture of budgets, payments and estimations partly on regional, partly on national levels. It gives only hints what the basic direction of a region/country in this respect is.

Generally, the paradigm change is already quite notable in most regions as 2nd pillar type payments have become very important, especially in peripheric regions as in the Alps. In intensive agricultural regions such as Murcia or Ireland, on the contrary, 1st pillar payments are still strong.

Table 15   Case study regions: rural development interventions

case study region	pillar 1	pillar 2	thereof		comment
			axis 1	axis 2, 3 Leader	
Hedmark	not applicable (not a EU Member State)				
West Sussex	94%	6%	9%	91%	pillars national, axes England
Savoie	35%	65%	12%	88%	
Barnim	25%	75%	41%	59%	Brandenburg region
Chełmsko-zamojski	53%	47%	42%	58%	national
Murcia	61%	28%	63%	27%	
Timiş	41%	59%	44%	56%	national
Lungau	21%	79%	7%	93%	
Bolzano-Bozen	76%	24%	24%	76%	pillars national
Bács-Kiskun	33%	67%	48%	52%	axes national
South-West (IE)	51%	49%	11%	89%	national

Source: case studies, Council for the Rural Area rlg.nl/cap

3   IN-DEPTH ANALYSIS OF THE INTEGRATION OF SUPPLY CHAINS INTO RURAL DEVELOPMENT

3.1   Main characteristics of the supply chains

The analysis of the integration of agricultural supply chains into rural development is based on the information that is provided in the analysis of the supply chains within the case study regions. The supply chains considered here are those selected in the WP 2 for the most representative products (1, 2, 3 – cf. Table 3). In the case the number of supply chains analysed for a region was less than three, also alternative supply chains (1A, 2A, 3A– cf. Table 3) were used for the further analysis. The analysis is therefore based on 31 supply chains all together.

3.1.1   Attributes of the supply chains

The typology of supply chains used in the following chapters follows the one presented in chapter 2.4.1 "Deepening: differentiating production" where the products were classified into:

Specific products:

- ➜   A1 traditional and typical products (origin labelled products)
- ➜   A2 products identified by their territory
- ➜   A3 consumers-driven products

Standard products; they differ (among other criteria) in terms of type of market (local, national or export markets):

- ➜   B1 standard products of local consumption
- ➜   B2 standard products with geographical attributes for the consumers
- ➜   B3 standard products with a regional or national market
- ➜   B4 standard products with an international market

The product characteristics (standard/unique), marketing (indirect/direct) and production (conventional/organic) marketing system are based on the supply chain typology developed in WP 2 (cf. chapter 2.4) and can be taken from Table 10.

3.1.2   Methodology for standardising the data of the supply chains

For each supply chain the existing statistical data of the region, data from the interviews about the supply chains and information on the institutional actors and institutional networks were put into one format.[7] The characteristics collected for each supply chain concerned:

- ➜   The *type of regional development*; e.g. level of economic development, urban influence, tourism beds.

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7   An example of such a table combining all relevant data is given for Beaufort cheese (Savoie, France) in annex 2.

➔ The *regional importance* of the supply chain, e.g. lead product, medium importance, emerging

➔ The *geographical extension* of the consumption of the product, inside/outside the region

➔ the *dynamics* of the supply chain, i.e. the impact of past changes and future prospects

➔ The type and importance of the *resources mobilised*.

➔ A description of the *networks* between agricultural and other actors

➔ The *outcomes* of the supply chain in terms of employment and externalities (social, environment) and of sustainability (economic, social, environmental).

Type of regional development

The typology of regional development can be taken from Table 16. It uses a simplified synoptic grouping of the analysis in chapter 2.2 "Rural development status of the regions", (see Table 16) and is based on the following criteria:

➔ the level of economic development (in transition versus developed economy; indicator: labour productivity per person employed);

➔ the urban influence (rural/intermediate to urban region);

➔ the importance of the tourist sector (number of tourism beds per 1,000 inhabitants).

Table 16   Types of development of the 11 case studies

case study region	urban influence	labour productivity per person employed	tourism beds per inh.	Generalised type of development
Hedmark	low	high	low	developed, rural
West Sussex	high	high	low	developed, urban
Savoie	low	high	high	developed, rural, tourist
Barnim	high	high	low	developed, urban
Chełmsko-zamojski	low	low	low	in transition, rural
Murcia	high	low	low	developed, rural
Timiş	high	low	low	in transition, urban
Lungau	low	high	high	developed, rural, tourist
Bolzano-Bozen	low	high	high	developed, rural, tourist
Bács-Kiskun	low	low	low	in transition, rural
South-West (IE)	high	high	low	developed, urban

Resources mobilised in the supply chain

The type of resources mobilised in the supply chain were separated into natural, technological and human resources (N=natural, T=technological, H=human). Furthermore it was distinguished as the relative importance, if they were specific (S) to the territory or generic (G).

Importance and geographical extension

The **regional importance** and the **geographical extension** (consumation inside/outside the region) of the supply chains were taken from the case studies and their questionnaires.

Dynamics

The *past changes* of the supply chain were described along a scale with five steps: major decrease, minor decrease, no change, minor increase major increase. The following indicators were used:

➔ For the production, wholesaling and processing stages the past changes correspond to the answer given to the interview question "To what extent did production output of this product change since ca. 1993?"

➔ For the end consumers stage, the question "To what extent changed the demand for this product?" was relevant

The *future prospects* of the supply chain were described along a scale with five steps: major decrease, minor decrease, no change, minor increase major increase. The following indicators were used:

➔ For the production, wholesaling and processing stages the future prospects correspond to the answer given to the question "What is the demand forecast for the product (market perspective)?"

➔ For the end consumers stage, the question "To what extent would the demand change for this product?" was relevant

Networks

It was difficult to specify the networks of actors for each supply chain because only limited information was available in the questionnaires about the links between the actors in the supply chain and actors from other sectors (type of actors involved in the networks, type of interrelation, type of relationships, strength of the relation). So, the relevant networks for the supply chain were categorised in three categories of network intensity: "low", "medium" or high". In the case no data was given on actors from other sectors and on their links with the supply chain, the networks were considered as "low".

Outcomes

Three types of outcomes were analysed and assessed for each supply chain:

➔ its contribution to employment[8] in the region,

➔ its positive or negative effects on environment,

➔ its participation in social life (e.g. through its involvement in cultural events, associations or other social regional activities, the development of a cultural identity, the direct contact with consumers, …).[9]

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[8]   taking also into account self-employment

The importance of these three outcomes have been categorised into low, medium and high.

These outcomes don't encompass exactly the same notions as the economic, environmental and social dimensions of sustainability assessed in the questionnaires. Therefore, for each supply chain an estimation of its performance according to the three dimensions of sustainability was asked by giving a score of sustainability between 1 and 10 points. These estimations were transformed into three categories in terms of actual or good performances according to the following rules:

➔ The performance is seen as *good* (cells coloured in green) if the actual score of sustainability is ≥7 and if the difference between the actual and good performance is not more than 1 point.
➔ The performance is seen as *medium* (cells coloured in orange) if the actual score of sustainability is ≥7 and if the difference between the actual and good performance is more than 1 point, or if the actual score of sustainability is <7 and if the difference between the actual and good performance is not more than 2 points.
➔ The performance is seen as *bad* (cells coloured in red) if the actual score of sustainability is <7 and if the difference between the actual and good performance is more than 2 points, or if the actual score of sustainability is ≤3.

This method aims at normalizing the answers given in the questionnaires, which show great differences, especially relating to the good performance score. However it did not completely eliminate the difference of appreciation between actors of the different supply chains. Table 17 provides an overview on all characteristics gathered.

Table 17   Overview for the characteristics assessment the supply chains

category	characteristics	explanation
Type of region	level of economic development	developed/in transition economy
	urban influence	rural/intermediate to urban
	importance of the tourist sector	tourist/non-tourist
	employment in agriculture	% of employment
resources mobilised	type (for each stage of the chain)	natural, economic, technological, human
	relative importance	generic/specific from 1 (strongest) to 4 (lowest)
regional importance	importance for rural development	lead product, medium importance, emerging
geographical extension	place of consumption	inside/outside the region, mixed
dynamics	past changes future prospects	decrease/increase/no change, minor/major
	future prospects	future prospects
networks	network intensity (synthesis)	low, medium, high

category	characteristics	explanation
outcomes	type of outcomes	employment, environment, social
	importance of the outcomes	low, medium, high
	sustainability	each dimension (economic, social, environmental) was characterised by one out of 3 categories of performance (bad, medium, good)

3.1.3   A1: traditional and typical products (origin labelled products)

The first type of supply chain identified in this typology concerns local products based on a strong territorial identity and reputation, and/or typical products based on specific modes of production and whose quality, reputation or any other characteristics are attributable especially to their geographical origin. This is the definition gave by Sylvander (2004) to Origin Labelled Products which are products not necessarily protected by regulatory provisions or by agreement. The supply chains grouped into this type are: Beaufort Cheese (Savoie), Speck (Bolzano-Bozen), Wine (Bolzano-Bozen) and Schnaps (Lungau), which are all unique products. Except for Schnaps, the products have protected geographical indications (AOP, GGA or DOC). The main characteristics of this category of supply chains are given in Table 18.

Table 18   Main characteristics of the A1 "traditional and typical products" type

category	general characteristics	homogeneity inside the type
Type of region	all the supply chains are in rural regions with a developed economy, tourist	high
resources mobilised	one or more of the resources mobilized are specific of the region and three of the products have protected geographical indications (AOP, GGA or DOC) workforce represents a high production input, except for Speck production	medium
regional importance	high	high
geographical extension	Production is local for Beaufort cheese and Italian wine, and raw products are imported for Speck and Schnaps Processing is local End consumption is local, national or international	high, except for processing
dynamics	Low to high adaptability Upward trend, no significant future shift or behind	low
networks	strong relations with economic sector (tourism) generally strong link with local government (except for Schnaps) generally low relations with actors of environment (except for Beaufort cheese) generally low relations with actors of research or education (except for Beaufort cheese)	medium-low
outcomes	economic: good sustainability performance, low employment social: medium to good sustainability performance, positive effects on cultural identity environment: medium to bad performance for sustainability, positive effects on cultural landscapes	high-medium

Main differences inside this type: the production stage is mainly outside the region for 2 supply chains.

All the supply chains are in tourist, rural regions characterized by a developed economy and mobilize resources which are specific of the region at human level (know-how) but not always at natural and/or technological levels. These supply chains don't necessary rest on local natural resources, as two of them (South Tyrolean's Speck and Schnaps) mainly import the raw products needed for the processing stage from other regions. The major difference within this group comes indeed from the production stage which occurs either inside or outside the studied region. The workforce mobilized is higher when the production occurs inside the region. If the production is tied to a particular region, the producer-consumer relations can be proximate or distant and consumption takes place at local, national or international level, depending on the product. Only one supply chain (Schnaps) concentrates on direct marketing.

These products are characterized by a strong cultural identity and are well differentiated.

Dynamics

Two of the studied supply chains (Schnaps and Speck, which both mainly import the raw product) demonstrated their ability to adapt to past changes and they are forecast to adapt also well to the future shifts, with an upward trend in the production and consumption. The adaptability of Beaufort Cheese and above all of Bolzano-Bozen wine seems to be lower, production of this wine not following the future demand.

Intensity of insertion of agriculture in networks

These supply chains are characterized by strong to medium links to the economic actors of the territory, which are here essentially represented by the tourism sector. Relationships are also strong between local or regional government and the actors of the supply chain, except for Schnaps. Beaufort cheese (Savoie) is the only supply chain where partnerships are mentioned between farmers and actors of environment (NGOs and Natural Parks) and where there is a strong link to research bodies by means of the producers union.

Outcomes

The supply chains perform well in terms of economic and social dimensions of sustainability, and have also positive externalities on cultural landscape, except for Speck as near all of the raw product is imported. Social outcomes mainly consist in a strengthening of cultural identity. The supply chains considered in this category only contribute weakly to the total employment of the region, with a high level of self-employment, except for Speck.

3.1.4   A2: products identified by their territory

This type refers to identity products characterized by a territorial link which still exists but which is much weaker than in the A1 category and more based on cultural factors (tradition, know-how) than on natural factors (which are only important for apples from Bolzano-Bozen). The reputation of this type of specific products is also lower compared to the first type because of their lowest typicity. Their differentiation potential with substitute products is therefore smaller than for the A1 products.

The supply chains grouped into this type are: Apples (Bolzano-Bozen), Synnøve cheese (Hedmark) and hop (Perla beer from Chełmsko-zamojski). The main characteristics of this category of supply chains are given in Table 19. This type groups either local products or regional speciality products, as their were defined by Forsman and Paanane (2002). Local food products are characterized by a production and a consumption taking place in the same area, which in our case may be more or less extended, being small for the supply chain hop (the region of Lublin for Perla beer) or nation wide for the Norwegian Synnøve cheese. Consumers express here a preference for products of their own country or region, but the link between producers and consumers is not direct. Producer-consumer relations for the regional speciality product (apples from Bolzano-Bozen) are also distant, as this product is exported. So the distribution of this type of products have a lot in common with mainstream food supply chain.

Table 19   Main characteristics of the A2 "products identified by their territory" type

category	general characteristics	homogeneity inside the type
Type of region	all the supply chains are in rural regions with a developed or transition economy, and tourist or not	low
resources mobilised	one or more of the resources mobilized are specific of the region (mainly know-how) workforce represents a high production input, except for beer production	medium
regional importance	medium to leading (for Apples)	medium
geographical extension	Production and processing are local End consumption is local, national or international	high, except for consumption
dynamics	medium to high adaptability Upward trend, except for Apples (in decline)	low
networks	low relations with economic sector (except with tourism for Apples) low link with local government (except for Apples) low relations with actors of environment low relations with actors of research or education (except for Apples)	medium
outcomes	economic: medium to good sustainability performance, low to high employment social: bad to medium sustainability performance, positive effects on cultural identity environment: medium to bad performance for sustainability	medium-low

Main differences inside this type: the consumption stage is mainly outside the region for 1 out of 3 supply chains.

3.1.5   A3: consumers-driven products

This type of specific products refers to local products, grown and sold within a particular geographical area but without a special territorial character. They are characterized by their ability to meet the demand of the customers, specific know-hows[10] and their small-scale markets, and contrary to the A1 type they were created quite recently. They are sold directly (goat cheese and part of Brodowin milk), or via a short supply chain (Brodowin milk and wood), by producers to end consumers within a relatively small geographical area (the region and its surroundings). The supply chains grouped into this type are: Brodowin milk (Barnim), wood (Barnim) and goat cheese (Savoie). For the supply chain wood from Barnim (Germany), we have considered only the smaller companies which process wood into pellets, timber strips and log houses inside the region, and not the big companies. The main characteristics of this category of supply chains are given in Table 20.

Table 20   Main characteristics of the A3 "consumers-driven products" type

category	general characteristics	homogeneity inside the type
Type of region	the supply chains are in urban or tourist rural regions with a transition economy	medium
resources mobilised	specific human resources are mobilized (know-how), except for wood workforce represents a high production input	medium-high
regional importance	marginal emerging or important (wood)	medium-high
geographical extension	Production and processing are local (or regional for wood) End consumption is local or regional	high
dynamics	medium to high adaptability upward trend, except for goat cheese (in difficulty)	medium
networks	low to medium relations with economic sector (tourism, craftsman) high link with local government medium to high relations with actors of environment high relations with actors of research or education (except for goat cheese)	medium
outcomes	economic: bad to medium sustainability performance, low employment social: bad to good sustainability performance (associations, direct marketing) environment: bad to good performance for sustainability (extensive or organic production)	medium-low

Main differences inside this type: The relations between producers and consumers, which are more direct for Brodowin milk and goat cheese than for wood.

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[10]   In the case of Brodowin milk, the supply chain is differentiated by its specific mode of production (organic farming).

3.1.6   B1: standard products of local consumption

The supply chains considered here deal with standard products intended to feed the local population. The supply chains grouped into this type are milk (Chełmsko-zamojski) and cereals (Timiş). The main characteristics of this category of supply chains are given in Table 21.

Table 21   Main characteristics of the B1 "standard products of local consumption" type

category	general characteristics	homogeneity inside the type
Type of region	the two supply chains are in moderately rural regions with a transition economy	high
resources mobilised	no specific resources are mobilized workforce represents a high production input	high
regional importance	important or leading	high
geographical extension	Production, processing and end consumption are local	high
dynamics	low adaptability in difficulty	high
networks	low relations with economic sector low to medium link with local government low relations with actors of environment low to medium relations with actors of research or education	medium-high
outcomes	economic: bad or good sustainability performance, high employment social and environment: bad sustainability performance	medium-high

Main differences inside this type: their economic sustainability (high for milk and low for cereals).

Both supply chains are in regions characterized by a transition economy and only use generic and local resources. Workforce represents a relative high production input. All the stages of this type of supply chain take place in the region studied and the market for these commodity products is directed at the private households.

Dynamics

Both supply chains showed a low ability to adapt to past changes and difficulties are foreseen in the future as the production is forecast to increase or not to change whereas the consumption would decrease.

Intensity of insertion of agriculture in networks

Both supply chains are characterized by low links to the economic actors of the territory, as well as to actors of environment. Relations between local or regional government and the actors of the supply chain are relatively strong for milk (Chełmsko-zamojski) but weak for cereals (Timiş) as Romania is a centralized country. Relationships with research and education are inexistent for milk (Chełmsko-zamojski) and of a medium level for cereals (Timiş) as the Banat's University of Agricultural Sciences has good collaboration with some actors of the

region, but low or no links to the farmers' community (and practically no farmer driven research is developed).

Outcomes

Both supply chains differ mainly by their economic sustainability, which is good for cereals but bad for milk. They show bad performances in terms of social and environmental dimensions of sustainability. Both supply chains only contribute to a high degree to the total employment of the region (36% for the milk supply chain) with a relatively high level of self-employment.

3.1.7 B2: standard products with geographical attributes for the consumers

Products of this type are standard products where the territory makes sense for the consumers either because the region's name has positive connotations for them (e.g. the clean and green image of Ireland), or because a marketing activity was undertaken to indicate the origin of the products (e.g. "Taste of Sussex[11]", a regional brand for local products) in order to meet the demand for local food by ethical consumers. Contrary to the A1 type, these products have no special territorial character. The supply chains grouped into this type are: milk (Savoie), beef and butter (South West), lettuce and milk (West Sussex). The main characteristics of this category of supply chains are given in Table 22.

Table 22   main characteristics of the B2 "standard products with geographical attributes for the consumers" type

category	general characteristics	homogeneity inside the type
Type of region	supply chains are in rural tourist or urban regions with a developed economy	medium
resources mobilised	no specific resources are mobilized workforce represents a high production input, except for beef (no data)	high
regional importance	medium to leading	medium
geographical extension	production and processing are local end consumption is local, regional or international	medium
dynamics	low to medium adaptability in difficulty or behind	medium
networks	low to medium relations with economic sector medium to high link with local government mainly low relations with actors of environment (medium for Savoie) low relations with actors of research or education	medium-high
outcomes	economic: medium to good sustainability performance, low or high employment social: bad to medium sustainability performance environment: bad to medium performance for sustainability	medium

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[11] "A Taste of Sussex" unites East and West Sussex producers under a regional brand under which processed food and specialities of region and other high quality foodstuffs are sold.

Main differences inside this type: the market which is either local or regional, or international (butter).

3.1.8   B3: standard products with a regional or national market

This type refers to standard commodity products sold either in the region or in the whole country.

Main characteristics

The supply chains grouped into this type are: milk (Lungau, Hedmark and Timiş), pork (Murcia, Bács-Kiskun and Timiş), maize and sunflower oil (Bács-Kiskun) and rapeseed (Chełmsko-zamojski). The main characteristics of this category of supply chains are given in Table 23.

Table 23   Main characteristics of the B3 "standard products with a regional or national market" type

category	general characteristics	homogeneity inside the type
Type of region	supply chains are in rural regions (non tourist except for Lungau) with a developed or transition economy	low
resources mobilised	no specific resources are mobilized (except for Lungau, but it is not highlighted) workforce represents a low or high production input	medium-low
regional importance	medium to leading	medium
geographical extension	production is local (except for Hedmark) processing is local (except for Timiş and Lungau) end consumption is local or regional	medium-high
dynamics	low to high adaptability upward trend or in difficulty or behind	low
networks	low relations with economic sector (medium for Lungau) low to high link with local government low relations with actors of environment low relations with actors of research or education (medium for Timiş)	medium-high
outcomes	economic: medium to good sustainability performance, low to high employment social: generally bad or medium sustainability performance (except for milk of Hedmark: good[12]) environment: bad to medium performance for sustainability	medium

Main differences inside this type: they come from networks with local government and from outcomes (employment, social outcomes, environmental effects.)

3.1.9   B4: standard products with an international market

This type refers to supply chains with mass production exporting standard products. The supply chains grouped into this type are: wood (Lungau), lettuce and tomatoes

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[12] The national cooperative "Tine", which process and distributes milk in Norway, supports local communities and local activities, for instance within sports.

(Murcia), mussels (South West) and wheat (West Sussex). The main characteristics of this category of supply chains are given in Table 24.

Table 24   Main characteristics of the B4 "standard products with an international market" type

category	general characteristics	homogeneity inside the type
Type of region	supply chains are in rural (non tourist except for Lungau) or urban regions with a developed economy	low
resources mobilised	all the resources are generic workforce represents a high production input (except for wheat)	medium-high
regional importance	medium to leading	medium
geographical extension	production is local processing is local (except for wheat not processed before being exported) market is mainly international	high
dynamics	medium to high adaptability upward trend except for tomatoes (in difficulty), no data for mussels	medium
networks	low relations with economic sector (medium for Lungau) low to high link with local government low or high relations with actors of environment low relations with actors of research or education	medium-low
outcomes	economic: bad to good sustainability performance, low to high employment social: bad to good sustainability performance environment: bad to medium performance for sustainability (except for wood_Lungau)	low

Main differences inside this type: they come from networks with local government and environmental actors and from all the outcomes.

3.2   Comparative analysis of supply chains

3.2.1   Methodology of synthesising the information at the supply chain level

The next step consisted in synthesizing these data collected at the different stages of the 31 supply chains into one table giving their main characteristics at the supply chain level. The synthetic table of results is given in Annex 2: Analysis of supply chain integration. In the next paragraphs we present the methodology used to synthesize information at the supply chain level for some key and non evident parameters.

Resources

To evaluate the specificity of the resources mobilised, we used a scale from -3 (not at all) to +4 (very much). The supply chains having a positive score are considered

to mobilise specific resources, whereas a negative score characterises supply chains using standard resources. The evaluation of the scores is the following:

➔ -3: if all the resources are generic (G);
➔ -2: if all the resources are generic but a label of quality not specific to the territory is present (e.g. integrated production, PEFC);
➔ -1: if all the resources are generic but it is considered that the geographical origin of the product is important for the consumer or if it is highlighted (e.g. Taste of Sussex);
➔ +1: if the resources are specific (S) to the territory at 1 level (from a natural, human or technological point of view);
➔ +2: if the resources are specific (S) to the territory at 2 levels (from a natural, human or technological point of view);
➔ +3: if the resources are specific (S) to the territory at 3 levels (from a natural, human or technological point of view).

These scores are enhanced by 1 point in the presence of a protected geographical indication (AOC, GGA, DOC) effectively highlighted in the supply chain.

Notations that were used for the radar-graphs in 0 (scores between 1 and 3):

➔ The score -3 is termed as "bad" and takes a value of 1.
➔ The scores -2, -1 and +1 are termed as "medium" and take a value of 2.
➔ The scores 2, 3 and 4 are termed as "good" and take a value of 3.

Extension of the supply chain

To characterise the extension of the supply chain we have used letterings which summarize the information on the production, processing and consumption stages as explained in the following examples:

➔ PPICO=Produced & Processed inside, consumed outside
➔ PPICI=Produced & Processed inside, consumed inside
➔ PPIOCIO=Produced & Processed inside and outside, consumed inside and outside
➔ PIPOCIO=Produced inside, processed outside, consumed inside and outside

Dynamics and perspectives of the supply chain

Adaptability: the ability of the supply chain to evolve according to the market was characterized by analysing the consistency of the evolution of the production outputs and demands at the different stages of the supply chains, as seen in the past (based on the data in the column "past changes") or predicted for the future (based on the data collected for "future prospects").

➔ Supply chains characterised by changes of the production outputs and demand occurring in the same direction (increase, decrease or no change) for all their stages, both in the past and for the future, were said to have a high adaptability.
➔ Supply chains characterised by changes of the production outputs and demand occurring in the same direction (increase, decrease or no change)

for all their stages, in the past or for the future, were said to have a medium adaptability.

➔ Supply chains characterised by changes of the production outputs and demand occurring not in the same direction (increase, decrease or no change) for all their stages, neither in the past nor for the future, were said to have a low adaptability.

Besides, the importance of the shift was specified in the case of a medium or high adaptability by using the adjectives minor or major (as indicated in the questionnaires).

Perspectives: The data collected for the production and consumption stages in the column "future prospects" of the questionnaire were used to give information on the trend or perspectives of the supply chain. It was considered that the supply chain will show an upward trend (=in growth) if the production and the consumption are assumed to increase, a downward trend (=in decline) if the production and the consumption are assumed to decrease, no significant shifts if no changes are forecast in the production or consumption, or that the supply chain would stay behind if the production would not change whereas the consumption would increase. Finally if the production is forecast to increase or to show no change whereas the consumption decrease, the supply chain is supposed to be in difficulty.

Networks

To evaluate the networks set up between actors of the supply chains and from other sectors, we used a scale from -3 (not at all) to +3 (very much). The supply chains having a positive score are considered to have set up significant networks, whereas a negative score characterises supply chains not well inserted into networks. The evaluation of the scores is the following ("note 1"):

➔ -3: if the networks with all the actors of other sectors (economy, environment, local or regional government, research and education) were scored as "low", and if there is no professional organisation;

➔ -2: if the networks with all the actors of other sectors (economy, environment, local or regional government, research and education) were scored as "low", and if there is at least one professional organisation;

➔ -1: if the networks with one actor of other sectors (economy, environment, local or regional government, research and education) were scored as "medium", and if the networks with other actors were scored as "low";

➔ 0: if the supply chain studied has relations with other supply chains of the region (themselves having perhaps networks) and if the other parameters induced a negative score,

➔ +1: if the networks with one actor of other sectors (economy, environment, local or regional government, research and education) were scored as "high", or as "medium" with at least two actors;

➔ +2: if the networks with two actors of other sectors (economy, environment, local or regional government, research and education) were scored as "high", or as "high" with one actor and as "medium" with another one;

➜   +3: if the networks were scored as "high" with at least three actors of other sectors (economy, environment, local or regional government, research and education).

Notations that were used for the radar-graphs in 0 (scores between 1 and 3):

➜   The scores -3 and −2 are termed as "bad" and take a value of 1.
➜   The scores -1, 0 and +1 are termed as "medium" and take a value of 2.
➜   The scores 2 and 3 are termed as "good" and take a value of 3.

Outcomes

Sustainability: We affect the worth performance among the different stages to characterise the sustainability of the whole supply chain.

Employment: The level of employment of the whole supply chain, in terms of its contribution to the total employment in the region, was taken as the best value among the employment levels resulting from its different stages. The level of self-employment was scored as "no", low or high, based on the results given in the questionnaires ("What is the proportion of self-employed farmers?") by considering that no=negligible=0-10%, low=20-40%, high=60-100%.

3.2.2   Specificity of mobilized resources

The contrasted situation regarding the mobilisation of specific resources between the A and B types reflect partly the way the typology was constructed. The A types which refer to specific products are indeed characterised by the use of specific resources and the B types which refer to standard products use more generic resources.

The two exceptions are on the one hand, the wood_Barnim supply chain (A3 type) for which we have considered that the know-how (as well as the natural resources) was not specific but just adapted to the demand of the consumers, and on the other hand, the milk_Lungau supply chain (B3 type) which uses specific natural resources, i.e. the alpine pastures, which are yet not highlighted.

We can also notice that the number of the resources mobilised is not necessarily high for the A1 type (e.g. for Speck_Bozen-Bolzano where only the human resources are specific).

Figure 25   Mobilisation level of specific resources among the different supply chain types
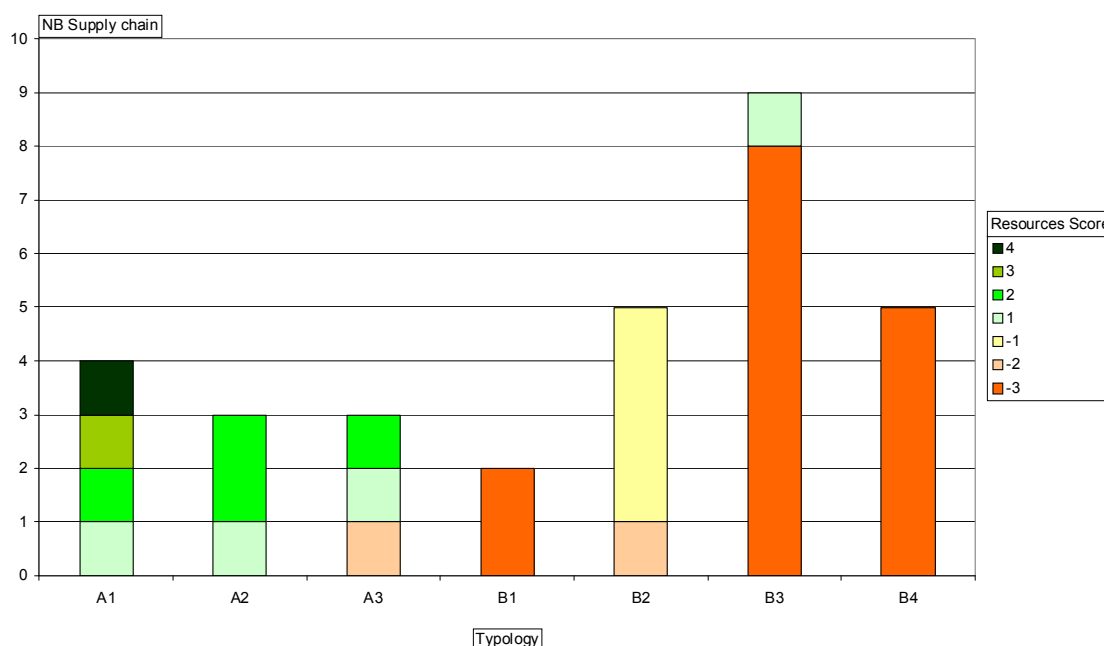
From -3 (not at all) to 4 (very much). The supply chains having a positive score are considered to mobilise specific resources, whereas a negative score characterises supply chains using standard resources.

3.2.3   Insertion of the supply chains in networks

The A3 type is characterized by strong links to the other actors of the region (Figure 26). Networking activities are indeed important for these consumers-driven supply chains, as for instance for Brodowin milk where the activities (e. g. the creation of the genetic engineering-free region association) are a "social and ecological responsibility" as well as an economic necessity because its biological framework conditions ensure the farms survival[13].

All the supply chains of the B2 type show medium to strong links with other actors of the territory, probably because networks help to promote the positive image of the products. On the contrary, networks with other actors of the territory seem to be less important for standard products of local consumption (B1 type). It is also important to notice that the type of actors involved in the networks as well as the type of interrelation may strongly differ between the supply chains. For instance supply chains from the A1 type have mainly cooperative relationships with tourism actors or crafts, as well as strong links with the local government (except for Schnaps_Lungau).

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[13]   See deliverable D.2.3 CASE STUDY REPORT, p. 297.

Figure 26   Level of networking activities of the different supply chain types.
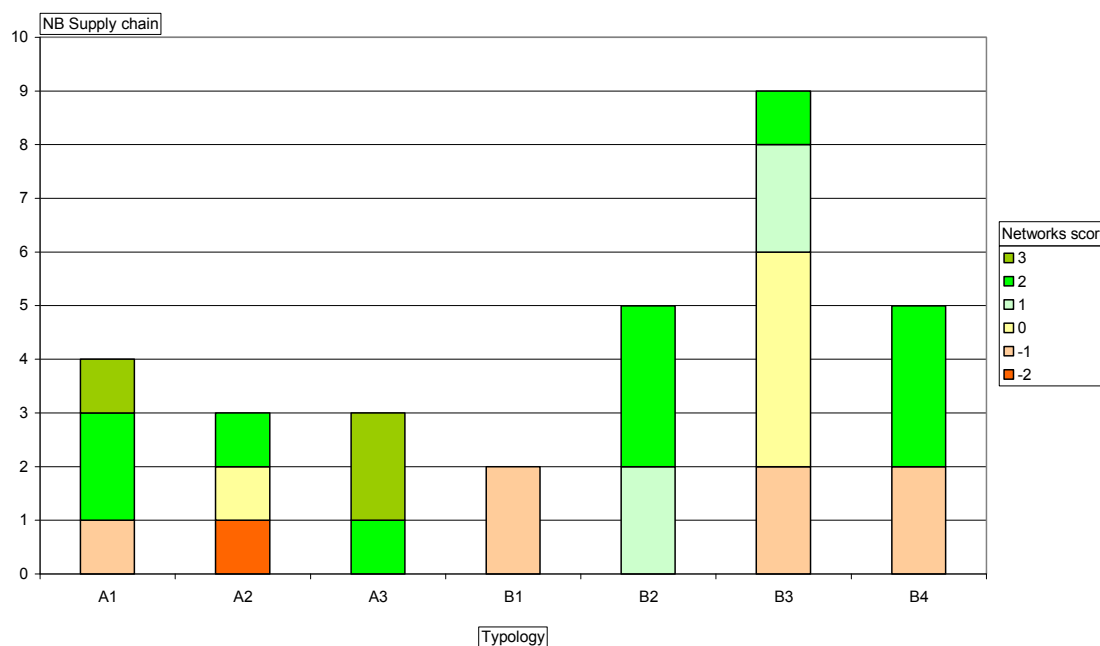
Less data were generally given on the economic actors implied in the networks from the B types, where the positive networks scores mainly come from the public support given by the local governments, and to a less extent from relationships with environmental actors for some supply chains. For these cases, the relationships may also be not cooperative, as for instance in the Murcia region (Spain) where water is a source of conflict between producers of tomatoes or lettuces, which need water for irrigation, and the Confederación Hidrográfica del Segura (CHS), an autonomous organism of the State General Administration, which have in charge the management of this scarce resource. For the B3 type, networks are also based on strong links with other supply chains of the region.

3.2.4   Outcomes of the supply chains

Sustainability

The diversity of situations makes it difficult to draw a general outline for each type and to compare types one with another. However, the following trends can be drawn from the radar-graphs of 0:

➔ The economic dimension of sustainability is scored better for A1 and A2 types than for A3 type, for which social or environmental dimension has also an important weight. The social dimension is generally more important for the A1 type than for the A2 type.

➔ The two supply chains of the B1 type are characterised by a low performance regarding the social and environmental dimensions.

➔ All the supply chains of the B3 type have a medium to good economic sustainability.

➔ The B4 type shows the greatest diversity of situations compared to the other types.

Figure 27   Economic, social and environmental dimensions of the sustainability for the different supply chain types.
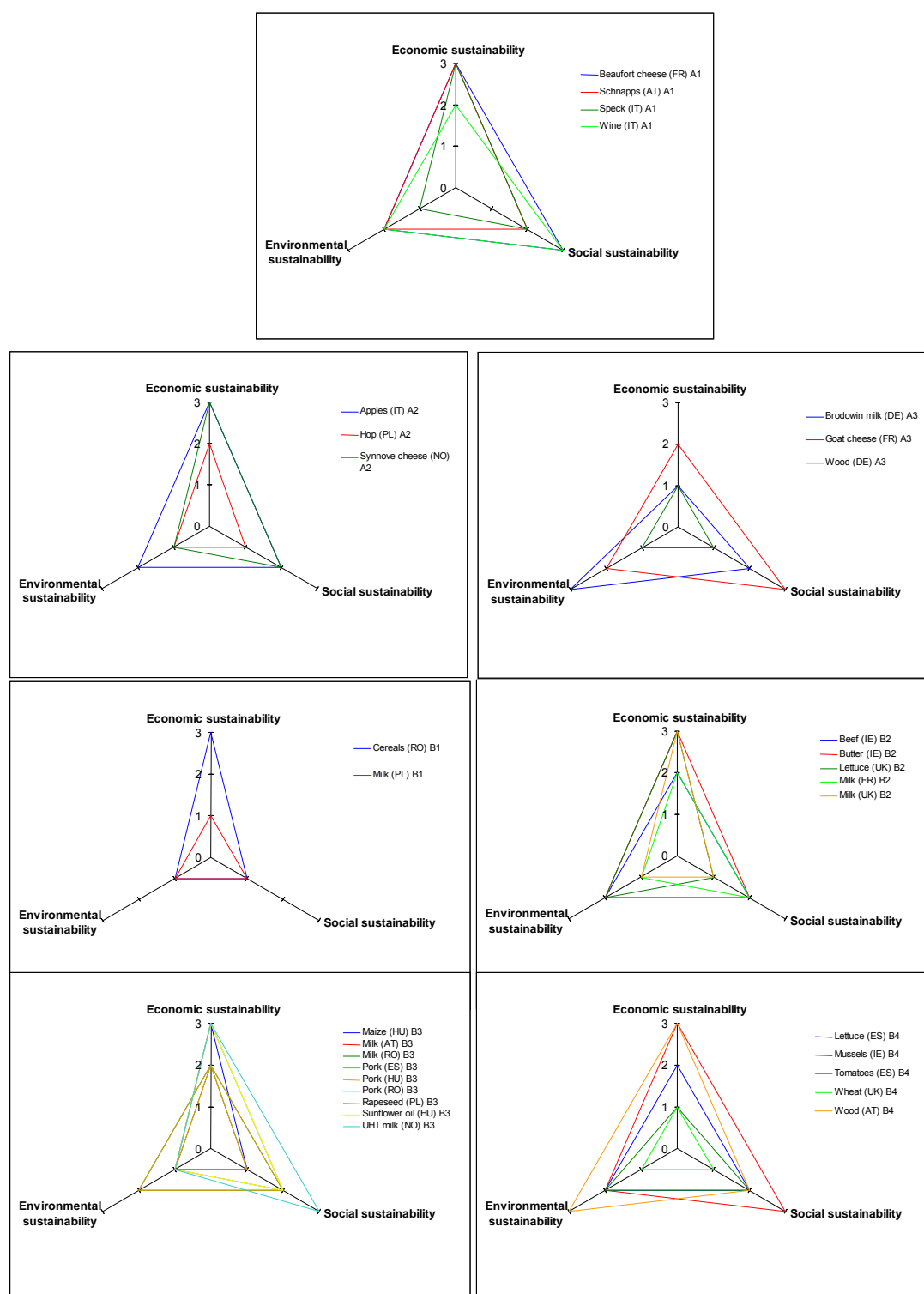
More details on these outcomes in terms of sustainability will be given further.

Employment

The proportion of self-employed persons in the case studies is quite frequent, as 20 supply chains out of 31 are characterised by a high share of self-employment (corresponding to a proportion of 60% or more). The supply chains of the A1 and A3 types generate little employment in terms of the contribution to the total employment in the region. The share of self-employment is generally higher for the A1 type than for the A2 and A3 types, but not in all cases (Figure 28).

All the situations regarding employment are present in the A2 type. A high contribution of the supply chains to the total employment in the region is more frequent for the B types than for the A types (especially the A1 and A2 types). The two supply chains grouped into the B1 types are characterised by a high contribution to the total employment in the region, with a high level of self-employment.

This homogeneity is not present in the other B types[14] which show a great diversity of contributions to the total employment in the regions. In terms of self-employment, the B3 or B4 types are more homogeneous, the B4 type being characterized by a low level of self-employment (except for the wood_Lungau supply chain) whereas the B3 only contains supply chains with a high level of self-employment.

Figure 28   Contribution of the supply chains to the total employment in the region
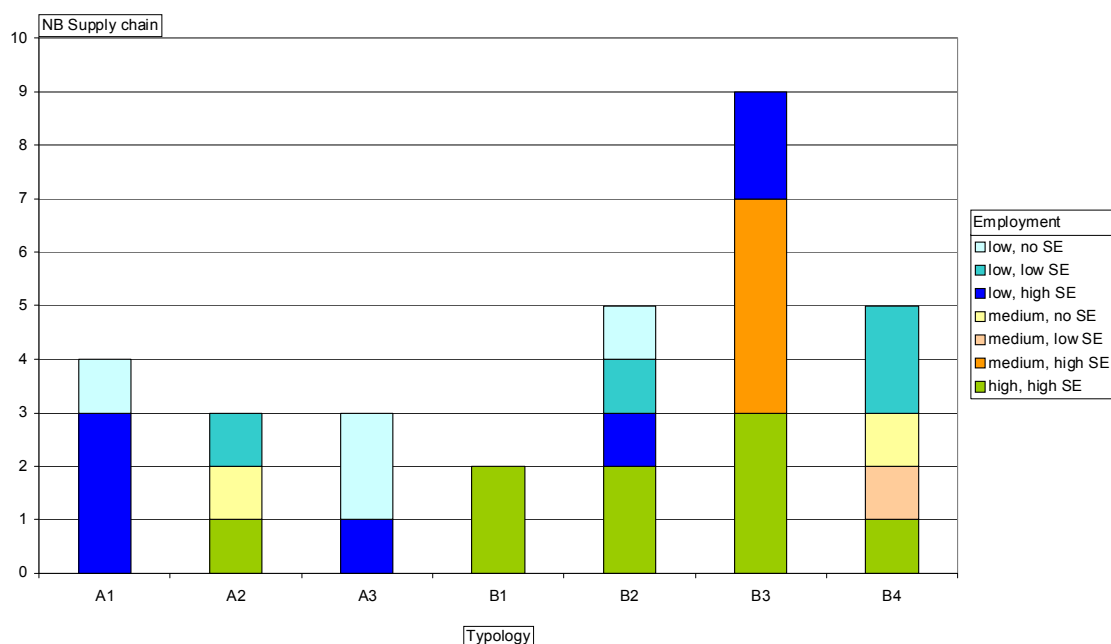
Social

The A1 and A3 types are characterised by high social outcomes, whereas the two supply chains of the B1 type show low social outcomes (Figure 29). The results of

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14   which also contain a higher number of supply chains

the other types are more mixed, but low social outcomes are more frequent for supply chains of the B types than for the A types.

The type of social outcomes also differs among the supply chains:

➔   for the traditional products (A1 type) outcomes mainly consist in a strengthening of cultural identity (festivals, local gastronomy…),

➔   for the consumers-driven products (A3 type), the participation in social life is based on the direct contact with consumers or in the involvement in associations,

➔   for standard products, the participation in social activities of the region consists either in the sponsoring of cultural events or sports associations by processing actors (e.g. in the B3 type, by the dairy cooperative named Tine from the Milk_Hedmark supply chain or by the oil producing plants from the Sunflower oil supply chain in Bács-Kiskun), in the involvement in Leader Action Groups of actors of the supply chains, or in the influence of the processing and packaging firms on the social spheres (e.g. for the lettuce and tomatoes supply chains of Murcia, in the B4 type).

Figure 29   Contribution to social outcomes of the different supply chain types.
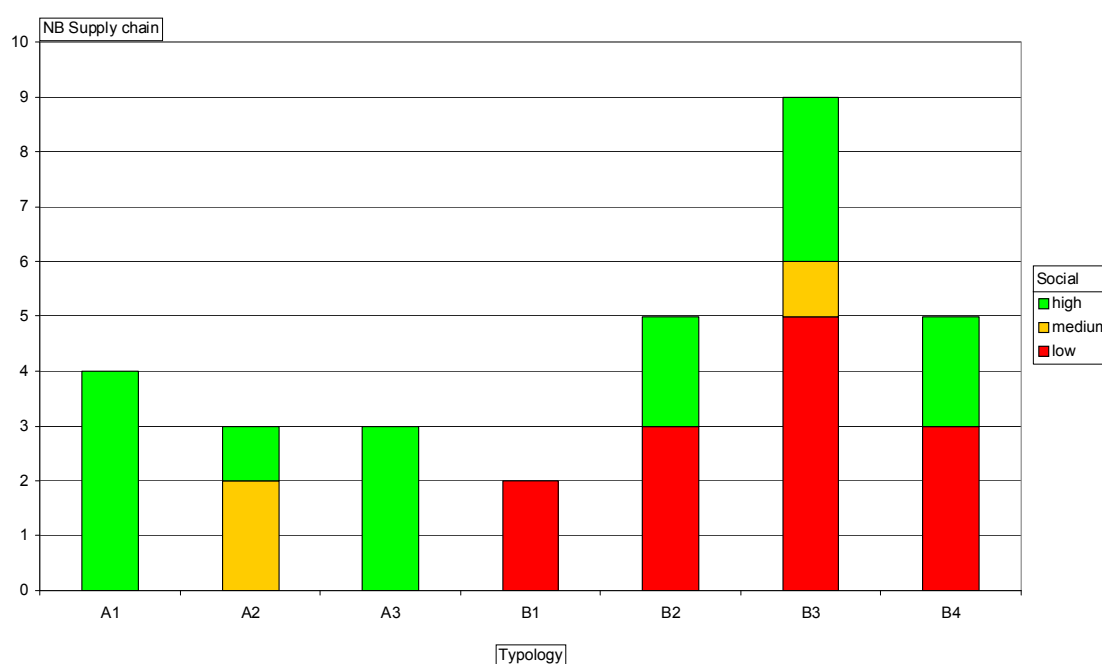
Environmental effects

In terms of the positive effects on environment, the A3 type show the best results (Figure 30), followed by the A1 type (except for the Speck production in Bozen-Bolzano), and the results are more contrasted for the other types, especially for the B4 type, which shows a great diversity of situations.

Figure 30   Environmental effects of the different supply chain types
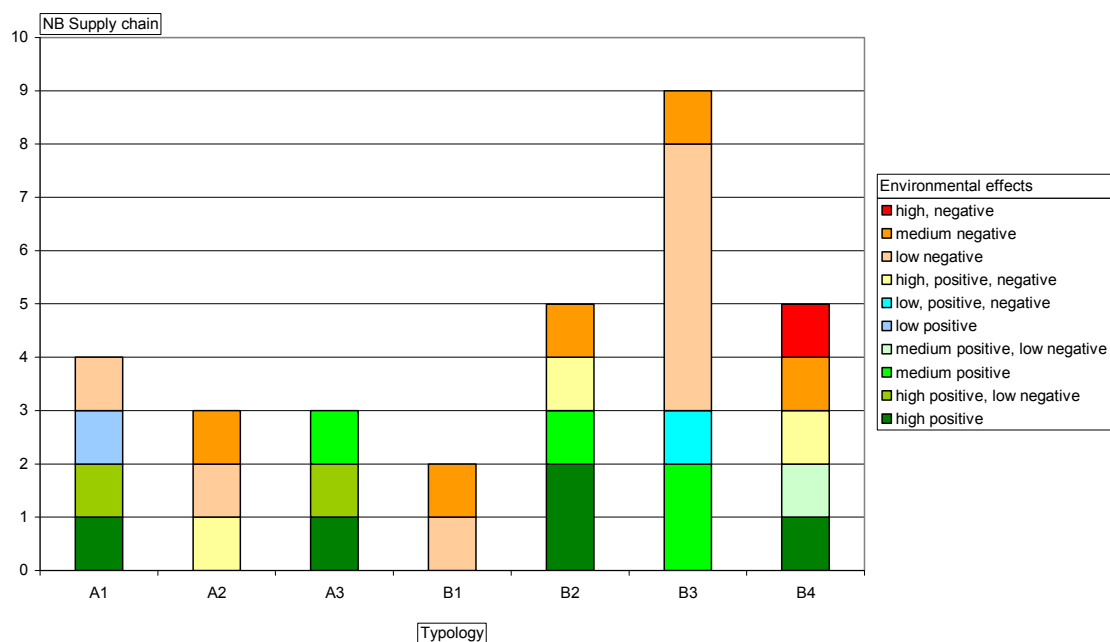
3.3   Analysis of the interrelations between mobilized resources, insertion into networks and outcomes of the supply chains

In this part, we will analyse for the 31 studied supply chains the interrelations between resources and networks on one hand, and between outcomes and resources on the other hand, in order to draw general outlines on these interrelations.

3.3.1   Interrelations between resources and networks

Figure 31 shows the diversity of territorial integration of the 31 supply chains based on their mobilisation of resources (specific *vs.* generic) and on the strength of their networking activities (low *vs.* high). The great tendencies that can be drawn are the following:

➔ the territorial insertion of supply chains with specific products (A types) is generally characterised by a high mobilisation of specific resources and strong relations with other actors of the territory. The three exceptions are Hop_Chełmsko-zamojski (Perla beer) and Schnaps_Lungau, two alcoholic beverages with specific know-how but low network activities, and Wood_Barnim, which mobilises generic resources.

➔ the territorial insertion of supply chains with standard products (B types) may be related to the use of generic products combined with medium networking activities.

As discussed before, the type of actors involved in the networks as well as the type of interrelation may strongly differ between the supply chains.

Figure 31   Diversity of the territorial integration of the case studies as expressed by the resources mobilised and the networking activities.
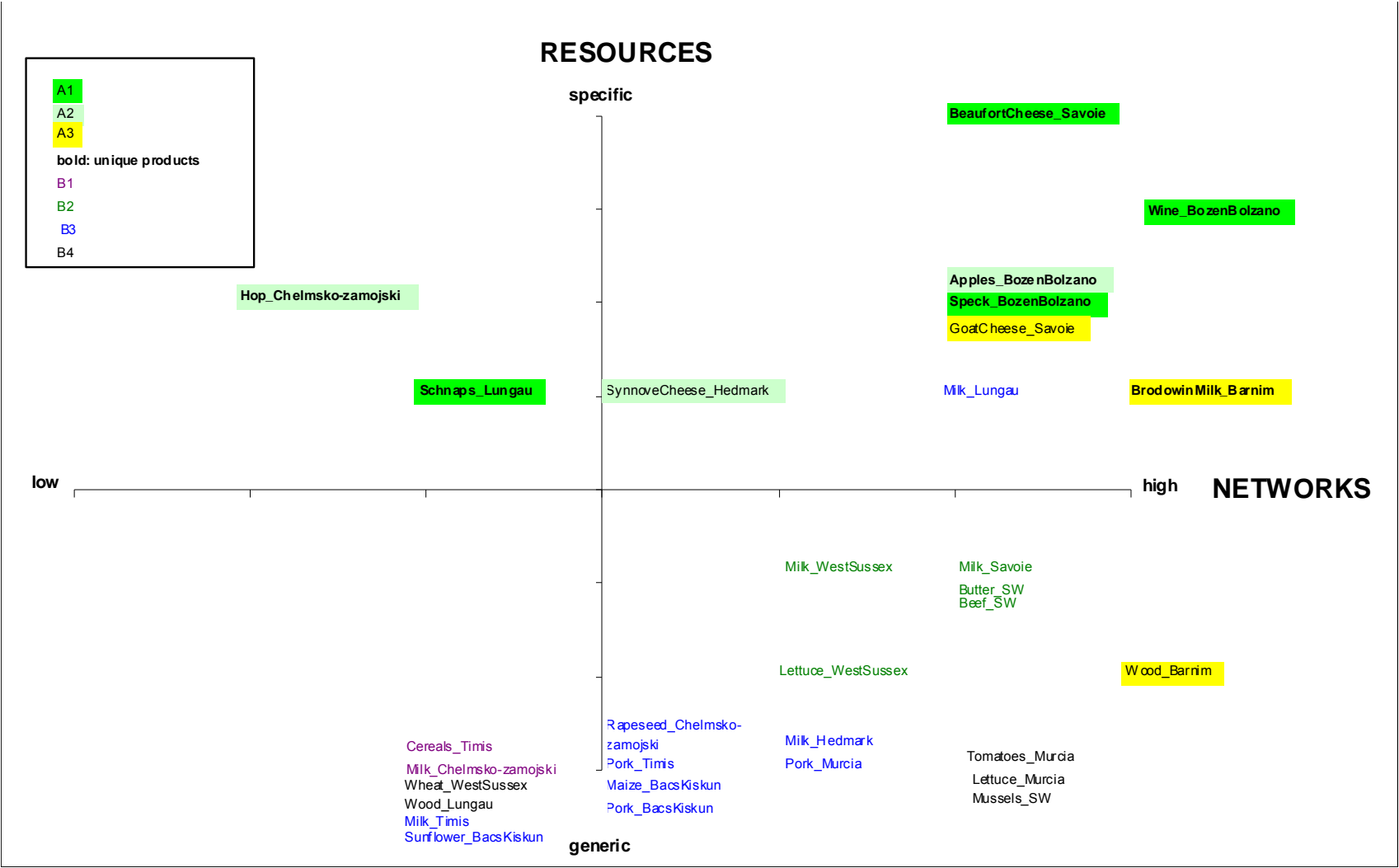
3.3.2   Interrelations between sustainability and resources

Economic sustainability

We have considered here the economic dimension of the sustainability by taking into account the results obtained at the supply chains level (cf. methodology). These results are the same as those obtained at the production level, except for 6 supply chains[15] showing a better score for the economic sustainability at the production stage compared to the other stages, and among which 3 out of 5 are from the B4 type.

The economic dimension of the 31 studied supply chains is generally seen as good, since only 5 cases are scored with a bad economic sustainability, whereas they are respectively 16 and 10 for the good and medium scores. In the case the economic dimension is only considered on the production stage, only 2 supply chains are considered to be of low sustainability, e.g. Milk_ Chełmsko-zamojski and Wood_Barnim.

Figure 32 shows the diversity of territorial integration of the 31 supply chains based on their mobilisation of resources (specific *versus* generic) and on the performance of their economic sustainability (bad *versus* good). The great tendency that can be drawn is that supply chains characterised by a link to the territory (A1, A2 and B2 types) perform well (medium to good economic sustainability).

It is also important to notice that *sustainability is a very subjective notion*, which was probably appreciated differently for the different supply chains (even if a good performance score was asked in the questionnaires).

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[15]   Brodowin_Barnim, Hop_Chelmsko-zamojski, Pork_Bács-Kiskun, Tomatoes_Murcia, Lettuce_Murcia, Wheat_West Sussex

Figure 32   Diversity of the territorial integration of the case studies as expressed by the resources mobilised and the economic sustainability
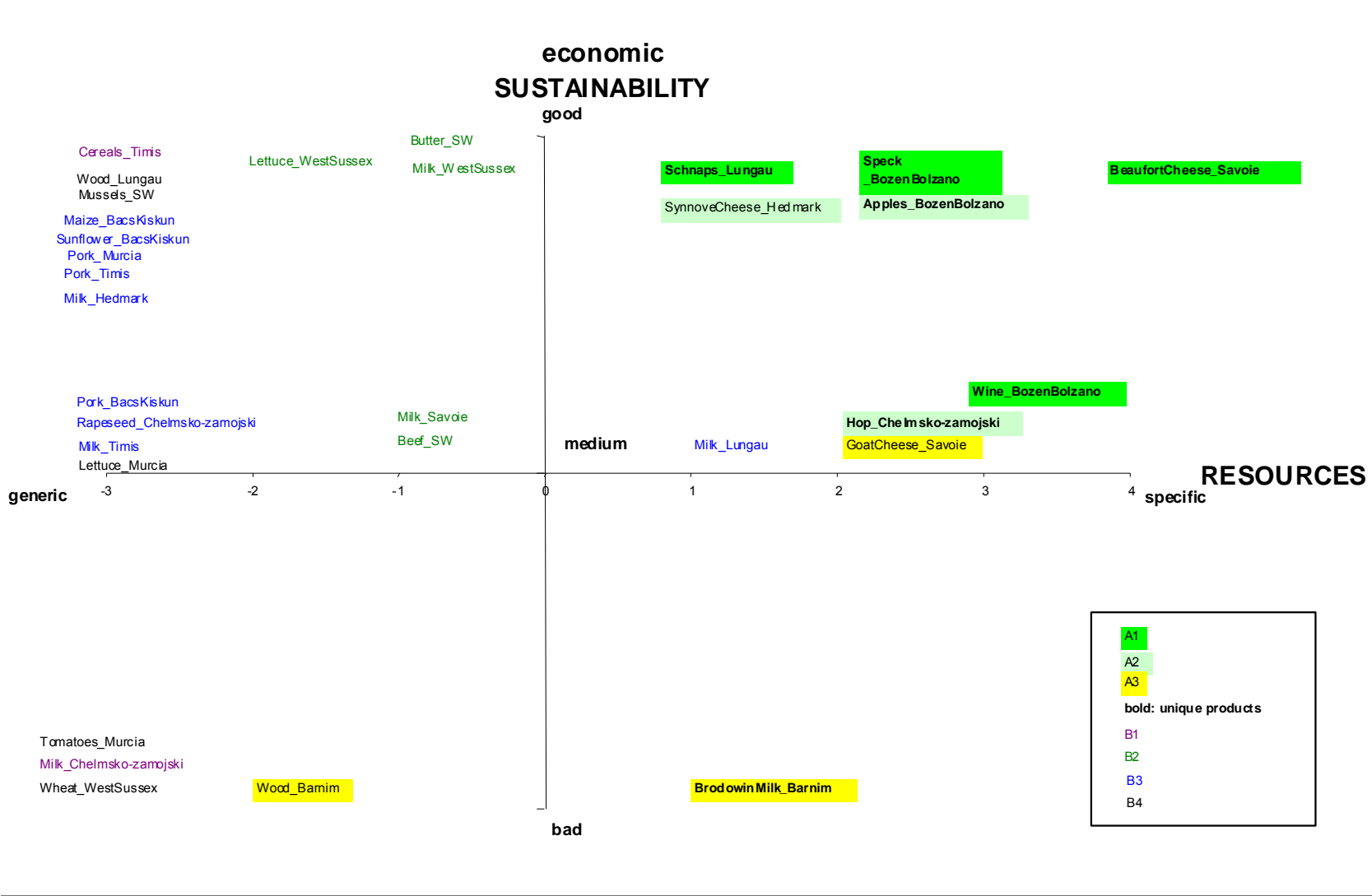
Environmental sustainability

We have considered here the environmental dimension of the sustainability by taking into account the results obtained at the production stage (or at the stage where the specific resource is mobilised when it is not the production stage, *e.g.* for Hop_Chełmsko-zamojski). We indeed noticed that the greatest difference between the production stage and the other stages was observed for the environmental dimension of the sustainability. We also consider that it was more relevant to study the relations between the environmental sustainability and the resources at the stage the specific resources where mobilised.

The results at the whole supply chain level gives 1 good sustainability, compared to 16 bad and 14 medium scores. By considering only the stage(s) where the specific resources are mobilised or at the production stage (for products with generic resources), it gives 8 bad, 6 good and 17 medium scores.

In all, 10 supply chains are concerned by a better sustainability at the production stage[16], among which 5 supply chains out of 9 are from the B3 type.

Figure 33 shows the diversity of territorial integration of the 31 supply chains based on their mobilisation of resources (specific vs. generic) and on the performance of their environmental sustainability (bad vs. good). The great tendency that can be drawn is that supply chains characterised by the mobilisation of specific resources have been considered to have a medium to good environmental sustainability.

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[16] Wood_Barnim, Pork_Murcia, Maize_Bács-Kiskun, Pork_Bács-Kiskun, Sunflower oil_Bács-Kiskun, Beef_SW, Mussels_SW, Synnøve cheese_Hedmark, Milk_Hedmark, Milk_Chelmsko-zamojski

Figure 33   Diversity of the territorial integration of the case studies as expressed by the resources mobilised and the environmental sustainability
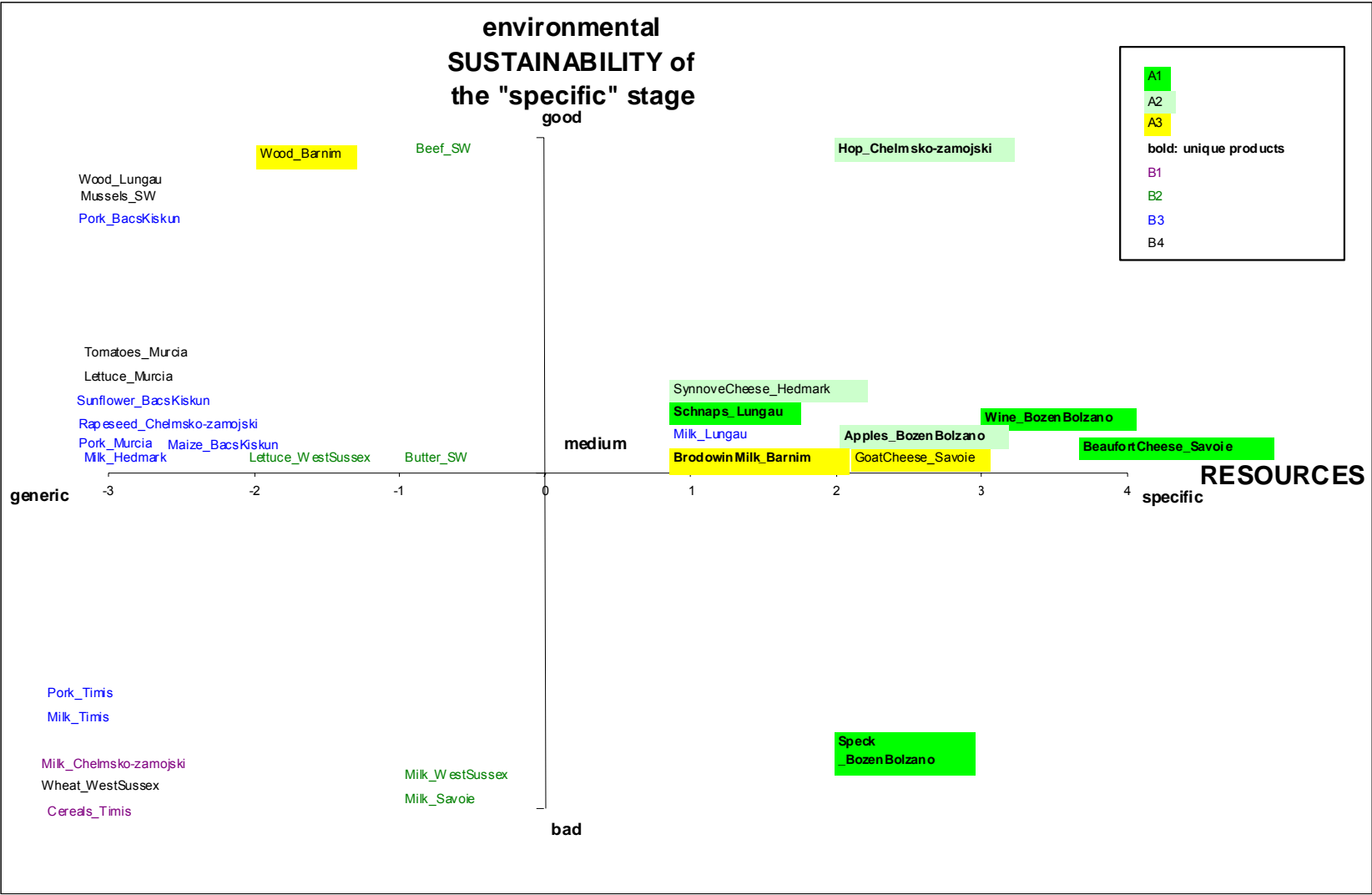
(specific stage= at the stage of the supply chain where specific resources are mobilized)

3.3.3   Interrelations between outcomes and resources

As sustainability is a very subjective notion, we have considered here the interrelations between the resources and three other outcomes (employment, social, environment).

Employment

Figure 34 shows the diversity of territorial integration of the supply chains based on their mobilisation of resources (specific vs. generic) and on their contribution to the total employment in the region (low vs. high). The great tendencies that can be drawn are the following:

➜ The territorial insertion of supply chains with specific products (A types) which mobilise specific resources is generally characterised by a low contribution to total employment in the region, and with high self-employment. The exceptions are found in the A2 type.

➜ Supply chains using standard resources may either contribute lowly or highly to total employment in the region.

Social

Figure 35 shows the diversity of territorial integration of the supply chains based on their mobilisation of resources (specific *versus* generic) and on their contribution to social outcomes (low *versus* high). The tendency that can be drawn is that supply chains with natural or cultural links to territory are characterized by high social outcomes.

Figure 34   Diversity of the territorial integration of the case studies as expressed by the resources mobilised and the employment.

Figure 35   Diversity of the territorial integration of the case studies as expressed by the resources mobilised and the employment
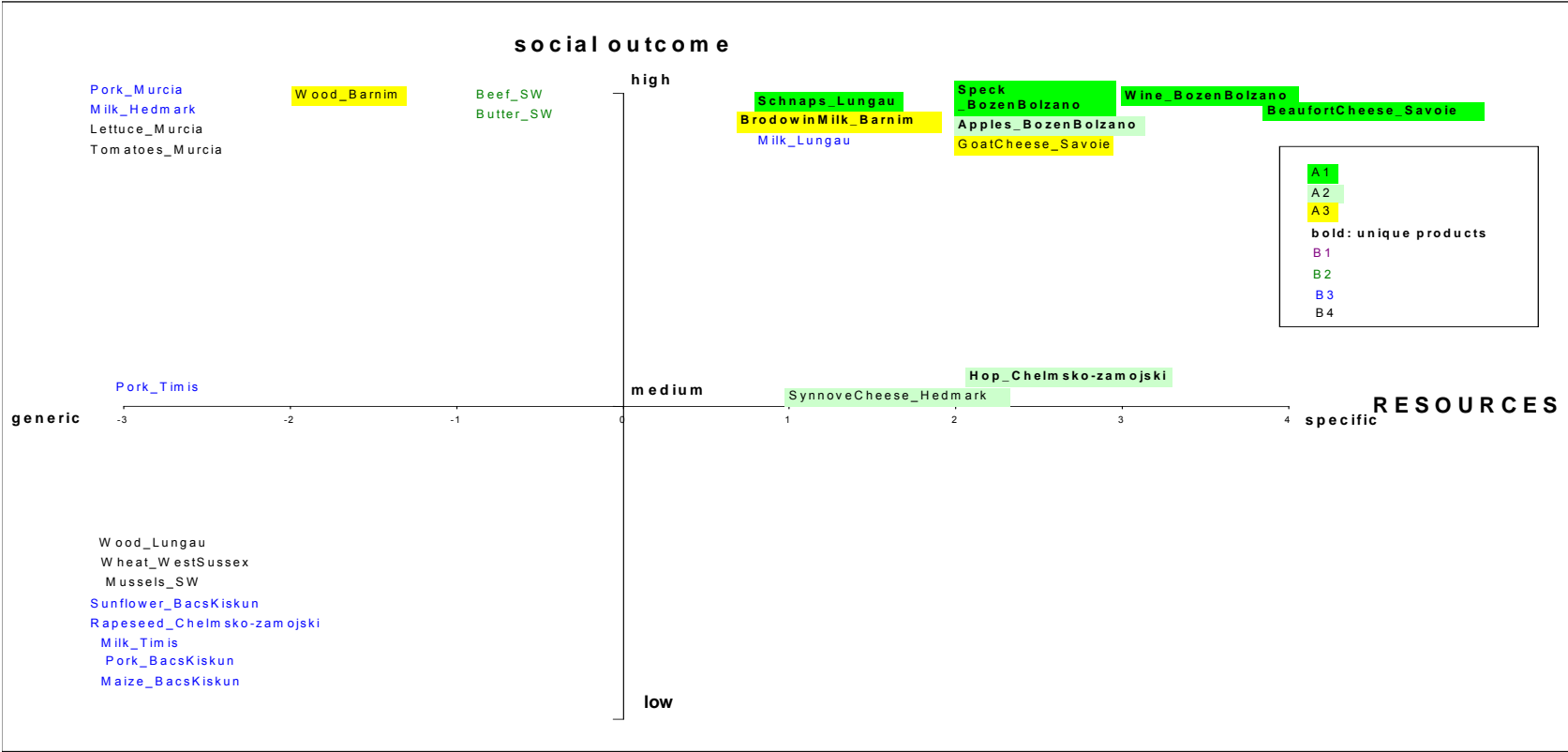
Environment

Figure 36 shows the diversity of territorial integration of the supply chains based on their mobilisation of resources (specific vs. generic) and on their effects on environment (negative vs. positive).

The tendencies that can be drawn are the following:

➔   The territorial insertion of supply chains with traditional products (A1) and consumers-driven products (A3) are characterised by positive effects on environment (except for Speck_Bolzano-Bozen where negative effects of processing are not counterbalanced by positive effects on cultural landscape as for the other A1 supply chains).
➔   The territorial insertion of supply chains using generic resources is more frequently related to negative effects on environment that to positive effects.

There is certainly a link with the type of production, generally more extensively for A types than for B types.

Figure 36   Diversity of the territorial integration of the case studies as expressed by the resources mobilised and the environmental outcome
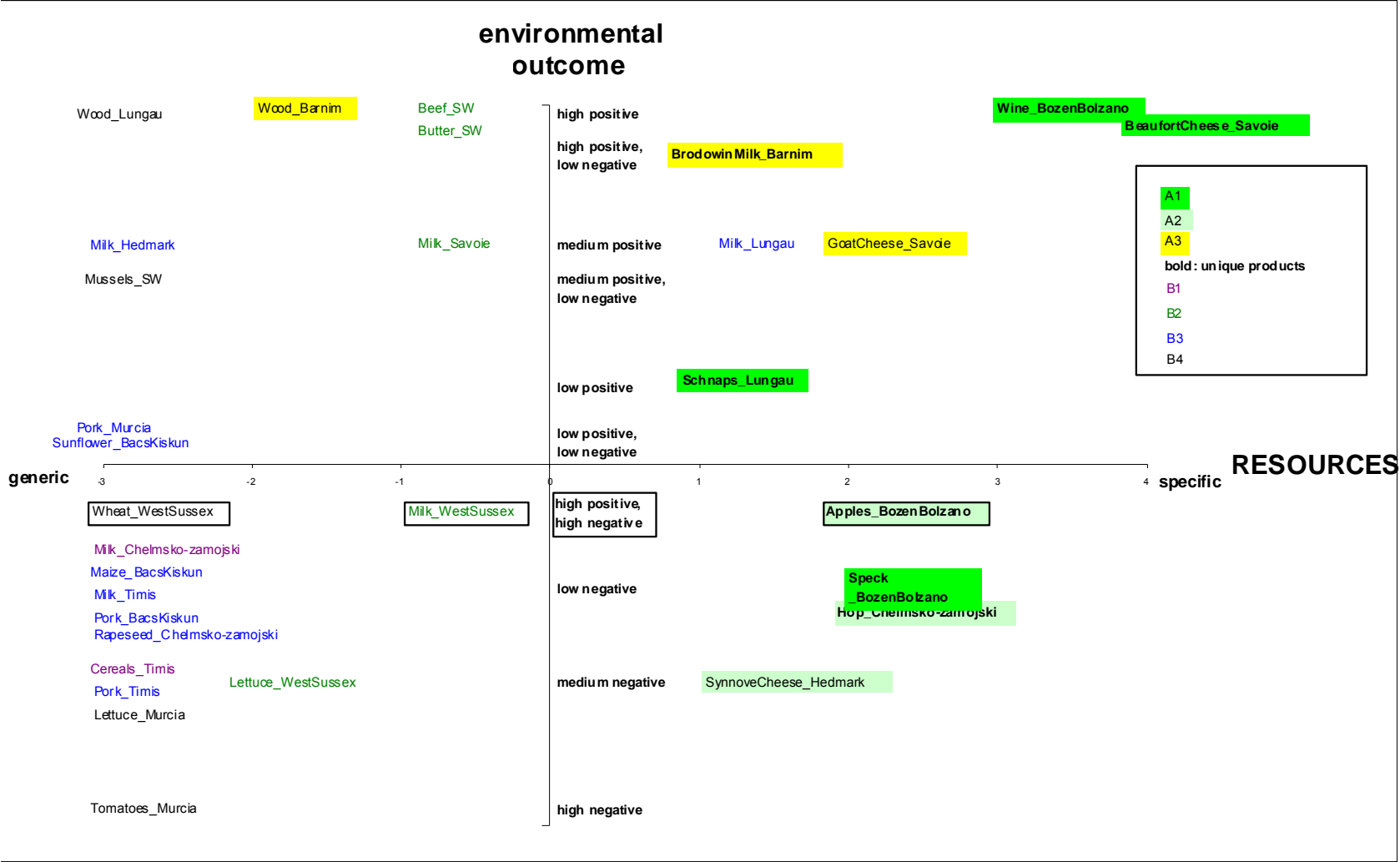
3.4   Relationships between types of regional development and supply chains

This part aims at exploring whether there is a relationship between the type of regional development and the characteristics of the supply chains.

3.4.1   Types of supply chain and regional development

Considering the distribution of the types of supply chains for the different regions according to their type of development (Figure 37), the following features can be underlined:

➔ all the traditional products (A1) are in tourist regions (which are all in countries with a developed economy for the TERESA case studies). These regions get an economic valorisation of their natural and cultural heritage not only by developing tourism, but also by mobilising their specific resources for the creation of specific products;

➔ consumers-driven products (A3) are in urban or tourist regions, certainly because it is more easy to find consumers interested by such new products in these regions; Thus they benefit from the proximity of a local market.

➔ supply chains feeding the local population (B1) are concentrated on countries with a transition economy, which also comprises 6 out of 9 supply chains of the B3 type (standard products with a regional or national market), and 1 supply chain of the A2 type (Hop, Perla beer from Chelmsko-zamoski).

➔ standard products with international market (type B4) are concentrated on countries with a developed economy, probably because they need strong investment for instance in infrastructure. Yet, these parameters are rapidly changing in transition countries.

Figure 37   Distribution of the types of supply chains
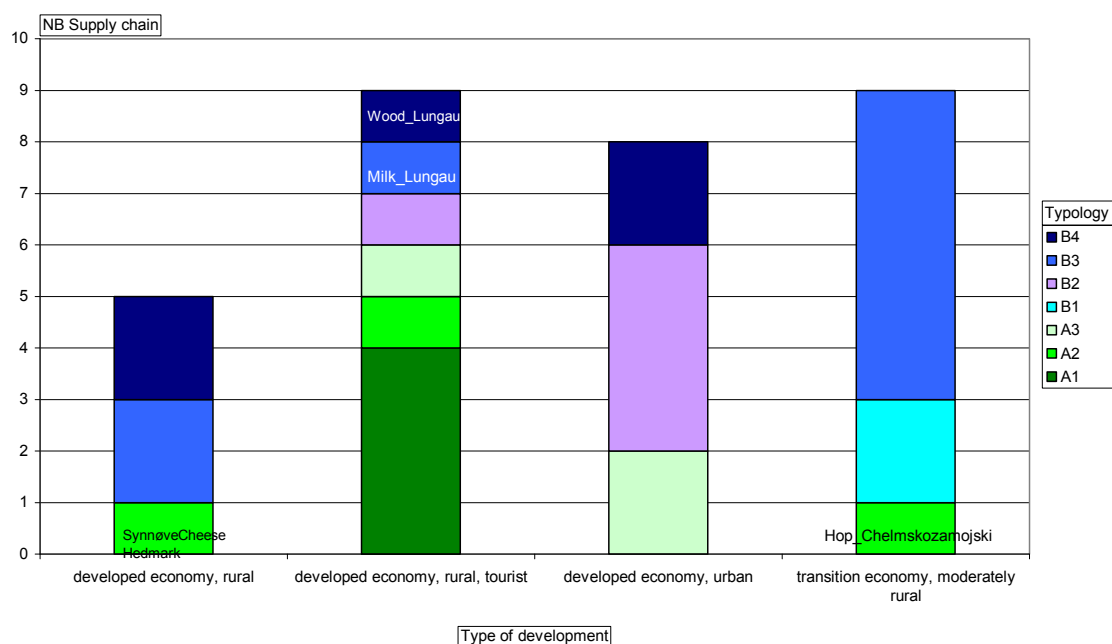
These results obtained on the TERESA case studies let us think that *there is a strong relationship between type of development and type of supply chains*. However this study concerns only 31 supply chains, which are probably not statistically representative of the diversity of the European supply chains.

3.4.2   Resources and regional development

Considering the distribution of the mobilisation level of the specific resources for the different regions according to their type of development (Figure 38), the following features can be underlined:

➔   In rural (non tourist) regions with a developed or transition economy, there is a low mobilisation of specific resources;

➔   In urban regions, the diversity of the resources mobilised is more important;

➔   In tourist regions, the patrimonial logic discussed for Figure 37 is found again.

The context of urban and tourist regions seems to be favourable to the mobilisation of more various types of resources and also of more specific resources.

Figure 38   Mobilisation level of the specific resources of the supply chains
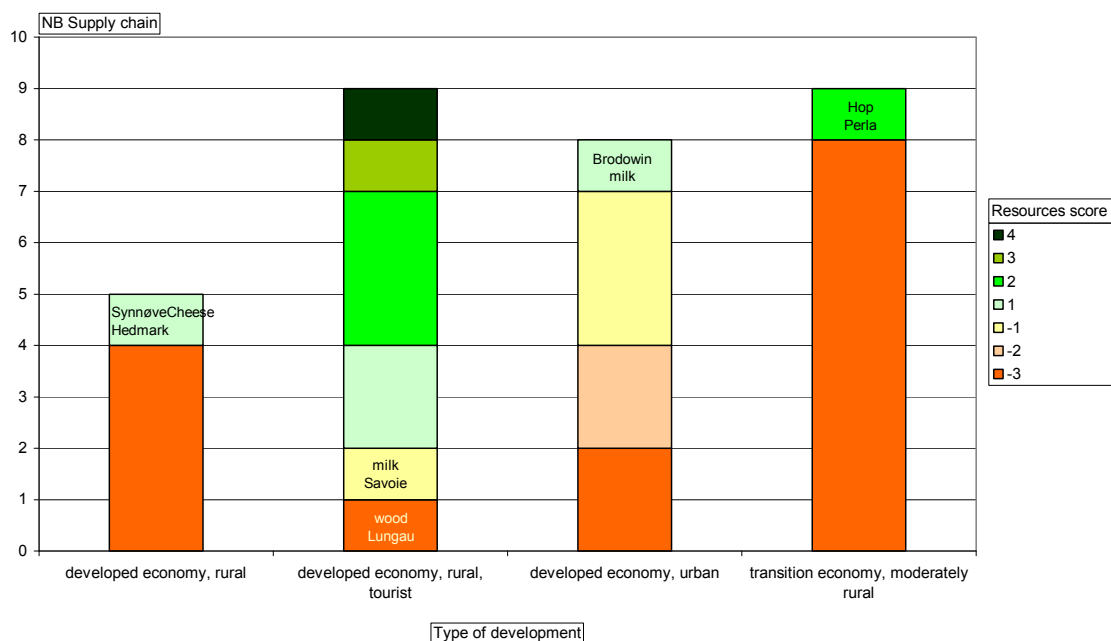
3.4.3   Networks

Considering the level of networking activities for the different regions according to their type of development (Figure 39), the following features can be underlined:

➔   In tourist regions, supply chains show strong networks with other actors of the territory (except for Schnaps and Wood of Lungau), the establishment of these networks being quite old,

➔   In urban regions, networking activities are also important but they are more recent;

➜ In rural (non tourist) regions, networks with other actors are strong in certain cases (e.g. for Murcia) but they are not the same as the networks present in the tourist regions (as discussed before for tomatoes and lettuce supply chains of Murcia, p. 86)

➜ In regions with a transition economy, supply chains are characterised by low networking activities.

Figure 39   Level of networking activities of the supply chains for the different regions according to their type of development.
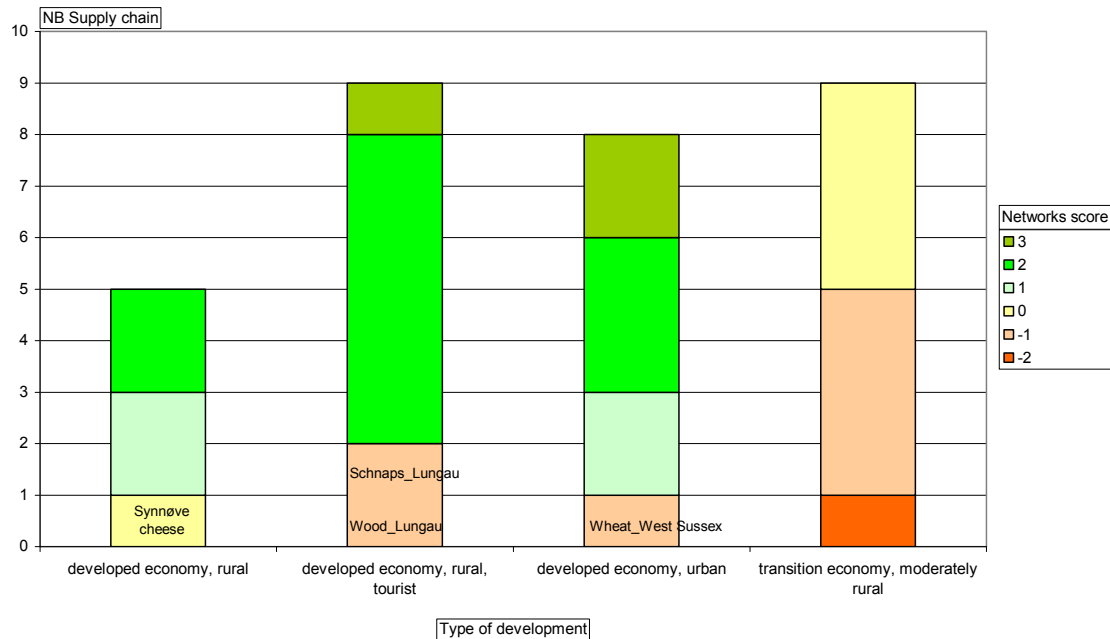
3.4.4   Outcomes

Economic sustainability

Figure 40 shows that in tourist regions the economic sustainability is scored better than in other regions.

Figure 40   Economic sustainability of the supply chains
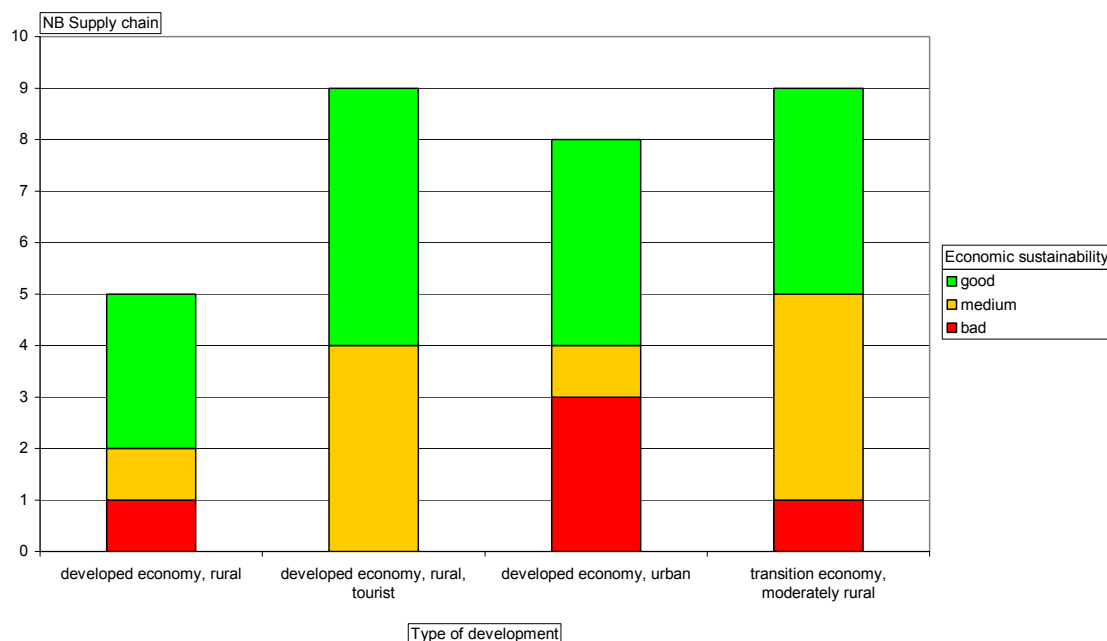
Social sustainability

Figure 41 shows that in rural (tourist or not) regions with a developed economy, the social sustainability is scored better than in other urban regions or regions with a transition economy.

Figure 41   Social sustainability of the supply chains
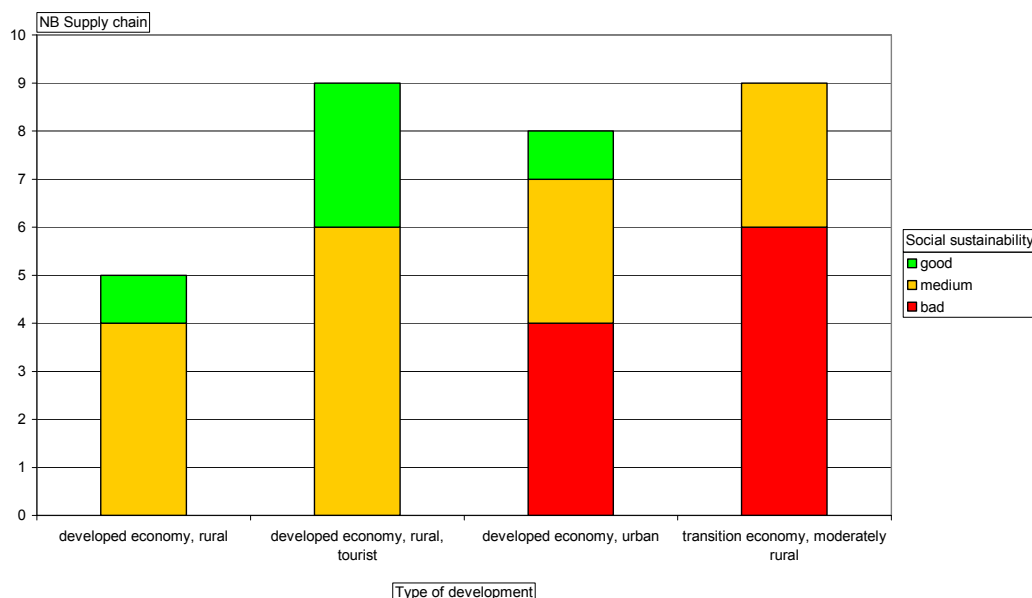
Environmental sustainability

Figure 42 shows that the environmental sustainability, which is not frequently scored as high, has the lower level in regions with a transition economy.

Figure 42   Environmental sustainability of the supply chains
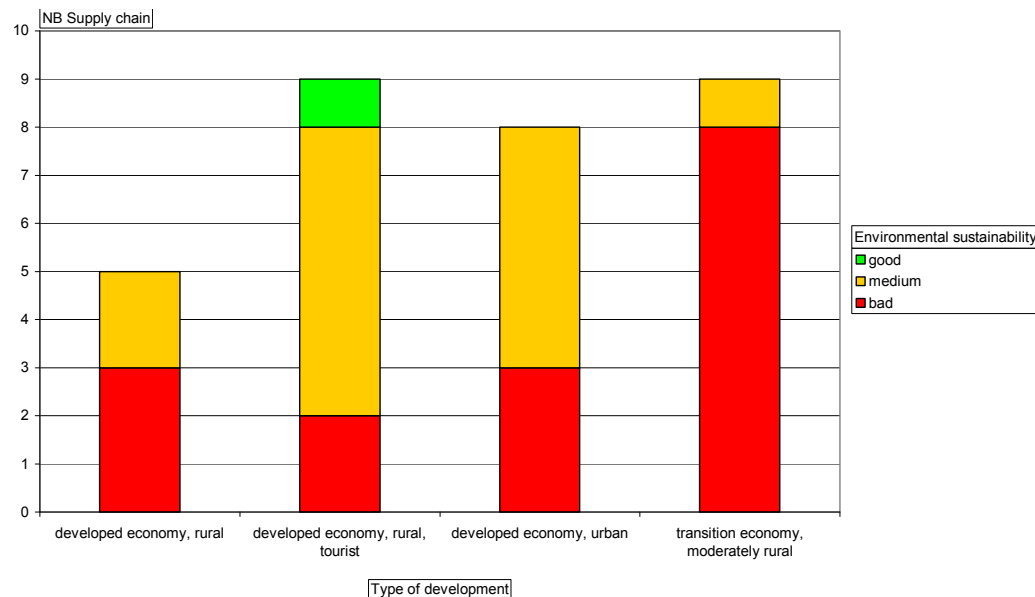
Employment

Figure 43 shows that the contribution of supply chains in rural regions with a developed economy to total employment in the region is less diversified compared to the other regions.

Figure 43   Employment contribution of the supply chains
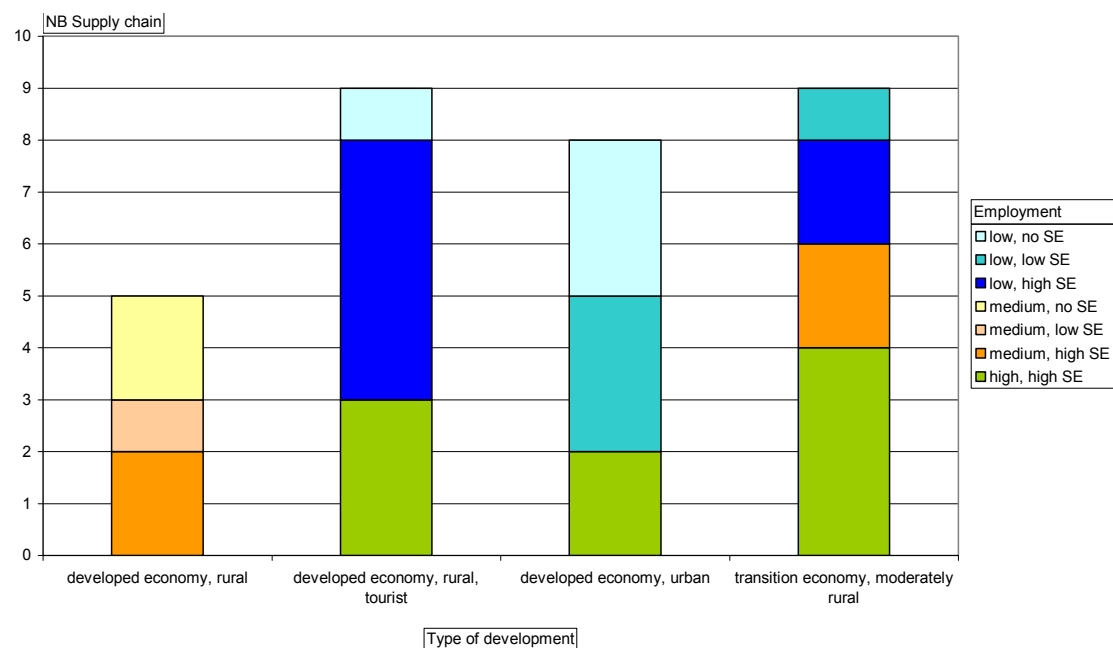
Social

The social outcomes of the supply chains for the different regions according to their type of development can be seen in Figure 44.

Figure 44   Social contribution of the supply chains
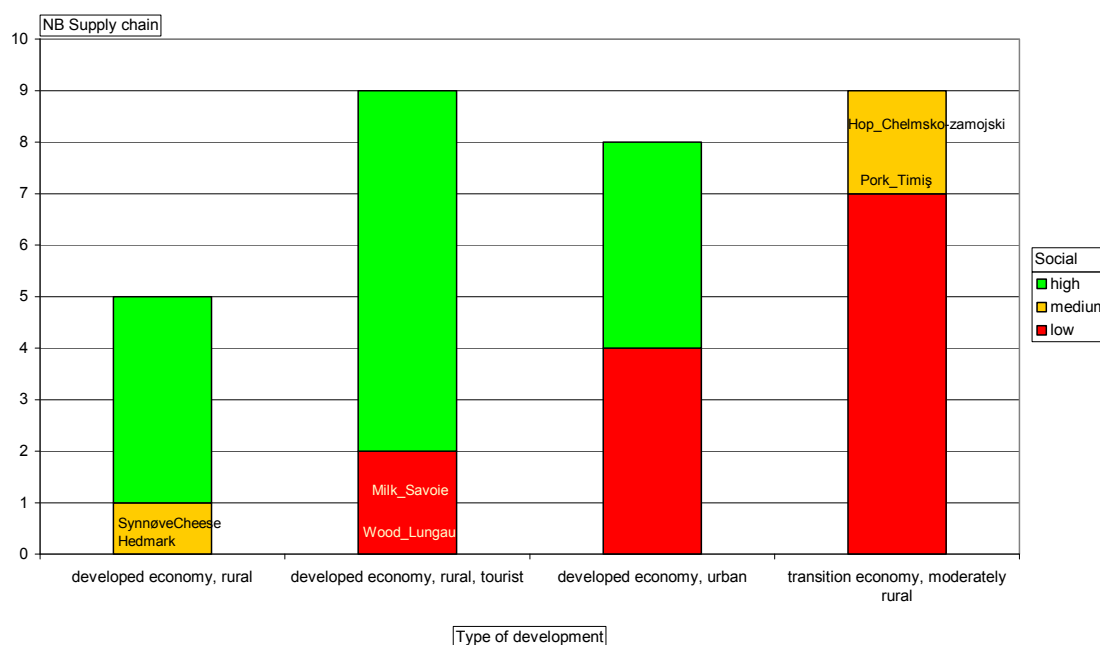
The following features can be underlined:

➔ In tourist regions, social outcomes of the supply chains are high, except for the two supply chains generating standard products (Milk_Savoie and Wood_Lungau),

➔ In rural (non tourist) regions with a developed economy, social outcomes are also mainly high,

➔ In urban regions, social outcomes are either high or low,

➔ In rural regions with a transition economy, supply chains are characterised by low social outcomes.

Environment

The distribution of the environmental effects of the supply chains (Figure 45) are more contrasted than those obtained for the environmental sustainability. In tourist regions and to a lesser extent in urban regions, the effects on environment are generally seen as positive, whereas in rural (non tourist) regions the effects are generally reported as negative.

Figure 45   Environmental effects of the supply chains
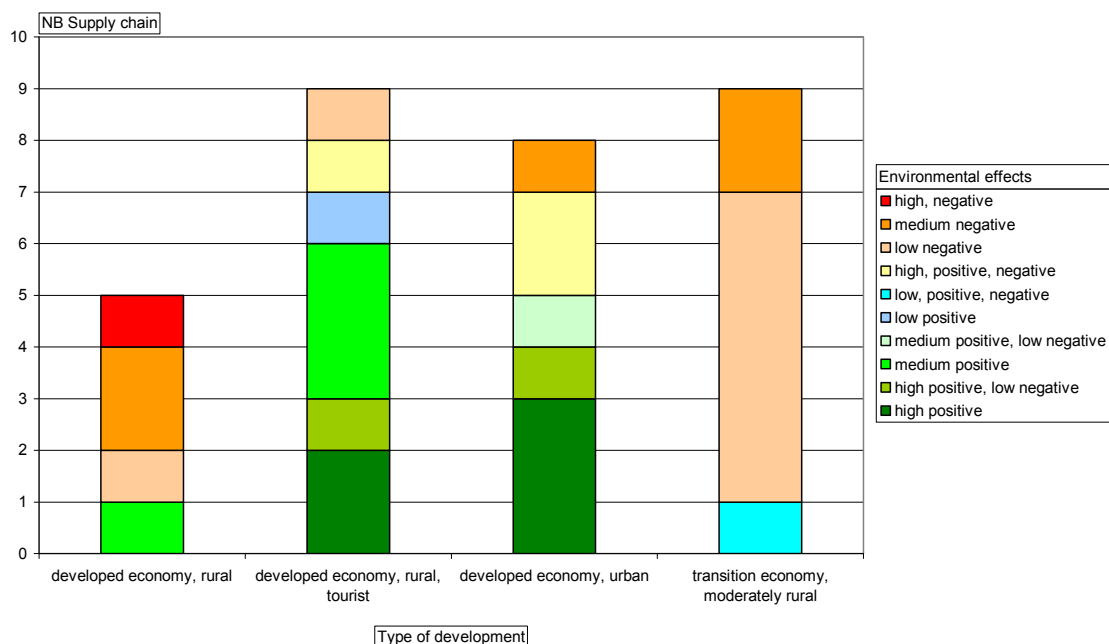
3.5   Lessons learned from the supply chain analysis

Even if the selection of 31 supply chains is rather small to draw a complete empirical picture of the diversity of agricultural production in European regions, there are some noteworthy conclusions. First, urban and rural tourist regions that have both a closer relation to the end-consumer, already seem to be very consumer-oriented in more specialising in origin-labelled products and other value-added strategies (organic products, processed products). Second, rural regions without important tourism and/or with deficits in economic diversity much more rely on producing standard products with mixed results. Within this group, fully developed economies orient more towards world commodity markets. Very similar conclusions same can be contested about the mobilisation of specific resources and the importance of networking activities: urban, tourist and world-market oriented regions show the strongest activities in this field.

Future research in this field incorporating an entirety of all representative supply chain models seems to be a promising avenue in the context of sustainable economic and social integration of agriculture.

4   ANALYSIS OF INTEGRATION PATTERNS OF AGRICULTURE INTO RURAL DEVELOPMENT

4.1   Building a concept

For the analysis of regional integration patterns, a simple division of regions into "in transition" or "developed", "urban" or "rural", that was used for the supply-chain-based analysis would not be detailed enough. Therefore the sustainability dimensions that accompanied TERESA since the project proposal will now be highlighted once more. To come up with different patterns we first have to make sure to pick out the influences that can really be adjusted by us. In this context, we would like to come back to the theoretical framework that was discussed in chapter 1 "Background of the study". Figure 46 recalls the TERESA dimensions of sustainable rural development: agricultural, economic and societal activities are embedded in the environment, natural and man-made, from which they basically draw resources.

Figure 46   Theoretical concept of integration patterns emerging
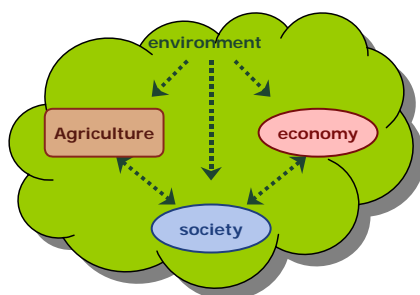
Source: ÖIR

There might be additional ties between economy, society and agriculture but traditionally, agriculture was standing by itself. But what are these ties and are they bilateral or unilateral? The three rural development paradigms that were presented in Table 1 offer three useful starting points:

➔   The dependency paradigm acted on the assumption of individual producers that act independently from other actors in the same sectors or other sectors in a *coexistence situation*.

➔   The competition paradigm favoured strong organised producers organised per sector that are in *competition situation* with other sectors of the economy but also of the rural system as a whole.

➔   The cooperation and territory paradigm that highlights multifunctionality used networks of activities, localities and ecosystems for different approaches for *cooperation situations*.

Coexistence situation

Living in simple coexistence was the most common integration pattern of agriculture and the rest of the rural economy for a long time. At the begin of

industrialisation, peasants moved to the cities as wageworkers. But after the first decades of industrialisation, the massive demand for labour came to a halt as automatisation continued. In Europe, many small and medium towns embedded in rural regions were centres of production industries, while the surrounding farms werde supplying the wage workers and food producers with primary products – the only integration pattern. This form of interaction is often combined with a high level of (semi-)subsistance farming and small farm sizes.

Competition situation

If natural and locational preconditions for agriculture in a region are good enough to ensure a high profibility, conflicts of interest with the other sectors of rural economy arise. The most relevant competition issues between agriculture and other activities in rural areas are:

➜ *Labour*: As wages in the secondary and tertiary sector are more attractive than in the primary sector, many farmers quit agriculture partly or completely to work off-farm which causes a population drainout and/or land abandonment in many regions today (cf. case studies Timiş, South-West Ireland). Additionally, many agricultural units struggle to find workers at competitive wages, especially for labour-intensive productions such as horticulture and forestry. Regional economic environment by its capacity to absorb labour has always had a major influence on structural changes in agricultural production when in the 1970s the diversification of rural economies has emerged as a new determinating factor (CEC, COM(88)601 final/2).

➜ *Land*: the most serious conflicts in more urbanised areas are land use conflicts, especially in regions that contain bigger agglomerations and tourist centres (cf. case studies West Sussex, Murcia). Pressure on turning agricultural land into building land can get enormous.

➜ *Water*: Again, tourist centres and bigger cities compete with agriculture for the sparse water resources, an occurrence that can especially be observed in the drier Mediterranean regions (case study Murcia).

It is very important to stress that "competition" in the sense used here is not meant as economic competition between regions or between economic actors seeking for a better position in the market, but rather the **competition for various resources** in the sense of sustainable, resource optimising development.

Cooperation situation

Mainly in regions that are not favoured by natural resources or the vicinity to market places, cooperation between different economic sectors is nowadays seen as the key to sustainable rural development. Using synergies can foster tourism or local crafts up to the use of a region for film or other creative industries. A special but at the NUTS 3 geographical level rather hypothetical case would be a full integration of agriculture, industrial and service sectors, which might occur in areas concentrating in the production and marketing of certain processed foods for example. In municipalities and alike, there might well be such a pattern.

Transitions between the three patterns

The potential of tightening ties with the rest of the rural players and the environment heavily depend of the special situation in the regions, and on the deepening, broadening and regrounding strategies (cf. chapter 2.4 "The integration of agriculture into rural economy and society"). An intensification or specialisation (e.g. horticulture) depends on the quality of preconditions such as the availability of high-quality soils and enough water and in some the case of vegetables on the distance to the major market areas, too (case studies West Sussex, Murcia). Adding value to existing products requires special knowledge, a spirit of innovation and in many cases large-scale investments (e.g. *Demeter* organic milk products, case study Barnim). An integrated rural development concept including agriculture, besides economic constraints, depends on the local social capacity, the will to innovation and other factors. Figure 47 pictures the hypothetic transitions between the three basic patterns.

Of course in the real world, in many regions a mix of both transitions will rather take place than only a single one. However, depending on the regional specifics, some types of regions clearly favour one pathway over the other.

Figure 47   Transitions from historic to nowadays rural settings
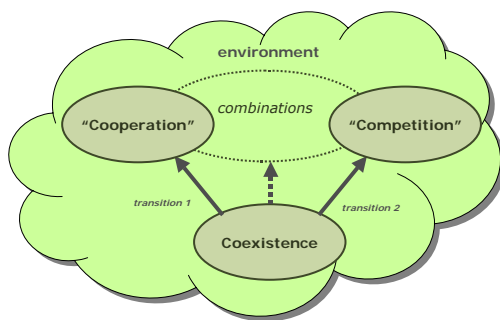
4.2   Including regional specifics detected in the case studies

The competition and cooperation settings can in principle be broken up into these different pathways of development.

Competition in urban regions

In strongly urbanised regions, for instance around larger cities, a the competition focus will be on land: agricultural production in urbanised regions have higher value because of the proximity to markets. Theoretically, this can be described using the (very idealized) model of agricultural land use was created by farmer and amateur economist J.H. von Thünen (1783-1850) in 1826. There are four rings of agricultural activity surrounding the city; dairying and intensive farming occur in the ring closest to the city. Since vegetables, fruit, milk and other dairy products must get to market quickly, they would be produced close to the city. Further outside, other products will be cultivated. As another example from theory, David Ricardo's Law of Rent states that the rent of a land site is equal to the economic

advantage obtained by using the site in its most productive use, relative to the advantage obtained by using marginal (i.e., the best rent-free) land for the same purpose, given the same inputs of labour and capital. The Law of Rent makes it clear that the landowner simply appropriates the additional production his more advantageous site makes possible, compared to marginal sites.

Figure 48   Models to describe agriculture in urban areas

The von Thünen Model   Ricardo's Law of Rent

Central City
Intensive Farming/Dairying
Forest
Extensive Field Crops
Ranching/Animal Products
Matt T. Rosenberg, 1997

Source: Rosenberg (geography.about.com)
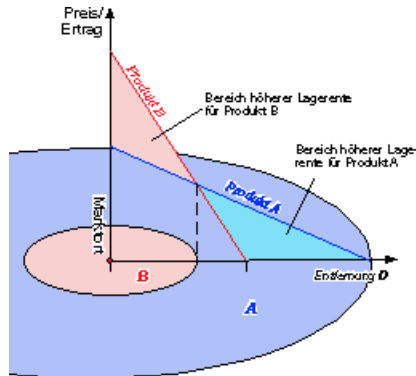
Second, a possible competition issue in these regions is the competition for labour because of attractive alternative income possibilities. Some farmers will give up farming, sell their land and switch to other income-earning activities; in other households, generally the men have urban jobs, while often women become responsible for the farming operations (FAO 2007).

Competition in high agricultural value regions

In certain regions the attractivity of (intensive) agriculture will not be based so much on the closeness to markets and job opportunities but rather on the good preconditions for agriculture. This type of competition for land is different to the one in urban regions. An extensive character of farming systems can partly be explained by natural conditions which prevent the use of modern techniques and machinery. But where natural conditions allow, farming will expand and/or intensify in order to increase yields and efficiency. This has been a continuous process in many parts of western Europe for decades, reflected in a steady increase in fertiliser inputs and yields. Environmental pressures are expected to decrease in western Europe, whilst many areas in central and eastern Europe will experience increasing agricultural intensity. This means that some of the high nature value farmland will probably be exposed to intensified agriculture in the near future (EEA 2004).

Cooperation in networking regions

As the case studies showed, some more regions show much more activities in working together. Especially the agricultural sector shows huge differences: while in regions like Bozen-Bolzano cooperatives have a very long tradition, in regions like Chełmsko-zamojski agriculture is very much influenced by the semi-subsistence

approach that everybody acts for himself only. Newer approaches to cooperative and integrated development strategies include of course Leader and Leader-type groups. There is no necessary inclusion of the environment into this cooperational setting.

Cooperation in high nature value and tourist regions

Instead, in these types of regions there is a special focus on "cooperation" with the environment. These include regions that have a very high cultural or recreational environmental values. The landscape will get studiously protected because it is an important resource. Extensive husbandry is usually the agricultural mode of choice, conventional and/or low-impact tourism are the most or one of the most important economic sectors. There is not necessarily a strong cooperation with other economic or social actors.

Cooperation in high nature value/tourist and networking regions

This type of regions combines the two into a (more or less) fully integrated regional development.

These six hypothetical types of integration discussed so far can be overviewed in Figure 49.

Figure 49   Hypothetical types of integration of agriculture into different rural regions
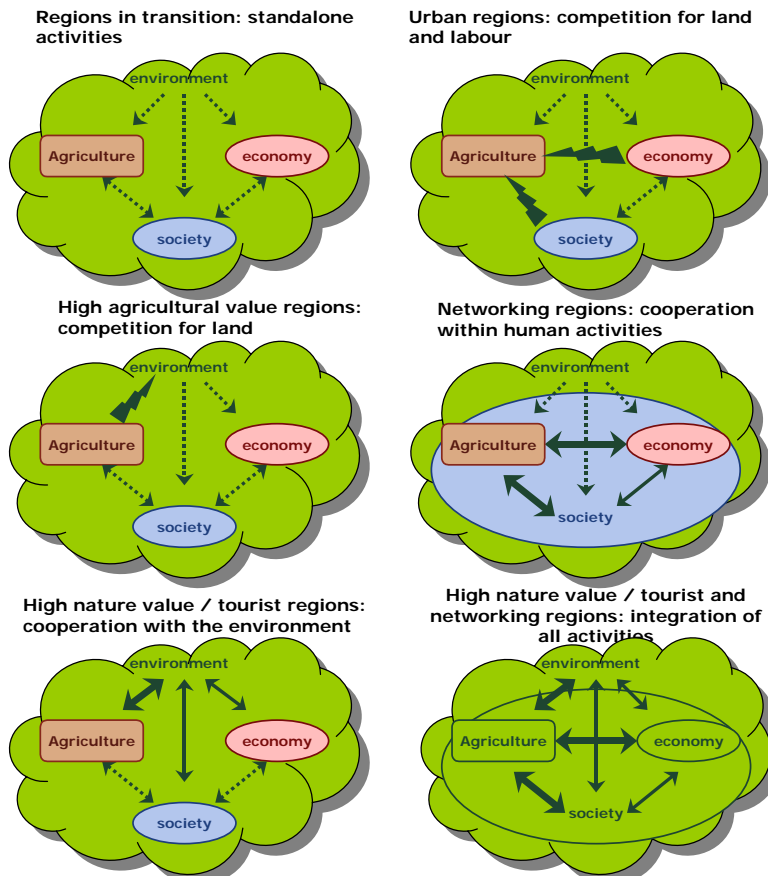
Source: ÖIR

4.3   Building a cluster analysis

In a quantitative cluster analysis of rural integration these more hypothetic developments are provided a basis using a number of indicators which will be presented in the following section. The problem arising with the approach chosen is, that most of the non-agricultural indicators – although traditionally closely linked to primary production – cannot be linked to the local agriculture for sure. So the result get tested using the case studies in this respect, as indicated in the structure in Figure 50.

Figure 50   Analysis of patterns of integration
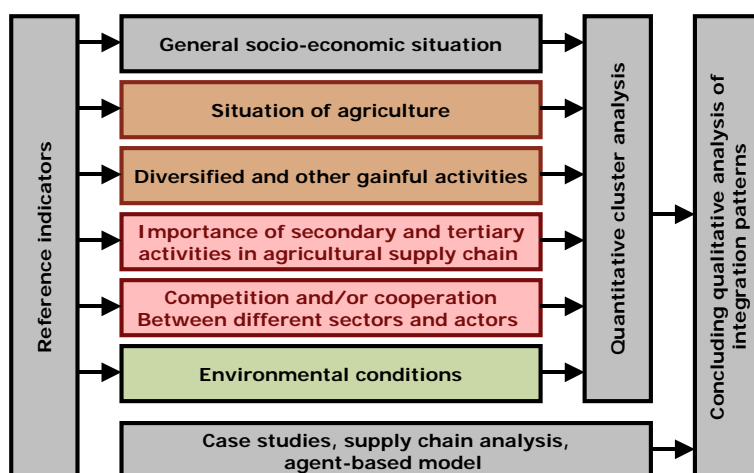
Source: ÖIR

4.3.1   Geographical level of the analysis

Opposed to the more detailed case study analysis on NUTS 3, for a policy-oriented analysis, levels below NUTS 2 are hardly feasible as they are usually not addresses on the Community level. Additionally, only a NUTS 2 analysis offers the possibility to include some highly detailed indicators (e.g. structural business accounts) which are needed to make a sound result possible. On the other hand, one has to state in advance that the NUTS 2 level some limits to a comparison with the NUTS 3 case study results.

4.3.2   Indicators used

It has to be pointed out, that a clustering exercise is always a reduction of complexity of reality. This means that a loss of information is quite obvious. There may be numerous single examples of regional characteristics to be found within each region, where the overall character of the cluster does not hold true (in terms of farm structure, tourism beds etc.). Still this result is the best grouping possible with the existing data depicting territorial characteristics.

The challenges in terms of methodological restrictions due to the data base has been tackled in the following way:

Comparability of territorial units – the question of size

Generally the challenge in comparing territorial units with different size is how to normalize the criteria depicting specific aspects. The GDP of a country is not to be compared with the GDP of a province in absolute terms. We have met this challenge by calibrating those indicators used over normalisation units (see description of the indicators in the annex), which met the requirement of arriving at comparability and taking into account territorial specifics of rural areas (e.g. arable land, inhabitants).

Data availability

An exhaustive list of indicators available on European level has been put together to meet the requirements of the above concept. A small number of NUTS 2 regions (10) had to be dropped because there were too many data missing. In some cases, certain indicators had to be estimated using additional internet research and data from neighbouring regions. Also Norway could not be included due to major data gaps.

In a round of statistical significance testing a number of indicators have been dropped for the ease of the cluster computation due to their statistical similarities (e.g. share of GVA in primary sector vs. share of employment in primary sector). In the final analysis of the clusters these could be compared nonetheless to enrich the picture. In the following lists of indicators, the indicators used for computing the clusters have been marked with an X, the others have been compared after the clustering.

Reference indicators

These indicators are mainly nominated as the possibility to relevate a number of other indicators. The population number though is in itself major issue for integration scenarios, as it describes the importance of regional sales markets for agricultural products. Concerning the "rurality" of areas itself, the Commission has consistently used the OECD typology and derivations from it, e.g. in the Strategic Guidelines for RDP 2007-2013, which is based on population density[17], in the Fourth Report on Economic and Social Cohesion[18] or in rural development reports[19].

- − Population (in 1000)
- − Population density
- − Area (km²)
- − Type of area (predominantly rural, intermediate, urban)

General socio-economic situation

To assess the overall development paths in a regions, these indicators have been included.

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[17] OECD, Creating rural indicators for shaping territorial policy, Paris, 1994
[18] Growing Regions, growing Europe (2007).
[19] Directorate-General for Agriculture and Rural Development (2006).

- GDP in pps per capita X
- change of GDP in pps per capita X
- share of GVA in primary sector X
- share of GVA in secondary sector X
- share of GVA in tertiary sector
- "share of employment in Primary sector"
- "share of employment in Secondary sector"

- "share of employment in Tertiary sector"
- "change of employment in Primary sector" X
- "change of employment in Secondary sector" X
- "change of employment in Tertiary sector"
- net migration crude rate (per 1000) X
- 25 to 64 year old participating in education and training X

Situation of agriculture

These indicators give information about the condition of agriculture in a region. In almost all European regions there is a strong decline in both employment and GVA numbers of the primary sector. Nonetheless, in some regions there might be important reasons where this decline is less strong than in others or there is even a positive development.

- absolute GVA in primary sector
- number of farms

- share of managers with agricultural training X

Diversified and other gainful activities

The above mentioned strategies of diversification and specialisations get explored with these indicators. In many regions most agricultural firms have activities in the industries or services, which might give a hint at the relations in between economic sectors.

- share of holders with other gainful activity X
- importance of secondary farm activities
- importance of secondary farm activities (per farm)

- importance of secondary farm activities (per GVA agri) X

Importance of secondary and tertiary activities in agricultural supply chains

In this thematic sector the non-primary businesses are looked upon that are closely linked to the primary sector to get an impression of the meaning of agricultural production for the rest of the regional economy.[20] Direct economic links will be expressed by using selected input-output table information.

- importance of industrial crops
- importance of industrial crops (per GVA agri) X
- employment in food industry
- "share of employment in food industry" X
- total employment (in 1000)
- employment in leather industry
- share of employment in leather industry X
- employment in wood industry
- share of employment in wood industry X

- total number of bed places
- change of total number of bed places
- bed places per inhabitant
- change of total number of bed places in %
- nights spent in totalnights spent in accommodations other than hotels
- nights spent per inhabitant X
- nights spent per inhabitant (non hotel) X

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[20] Chemical production is a sector close to agriculture as well, but as it is too difficult to directly link it to agricultural production why it is left out.

Competition and/or cooperation between different sectors and actors

Following the historical introduction, in this section of indicators the main fields of competition and cooperation between agriculture and other sectors will be explored (labour, soil, water).

- share of predominantly rural areas
- share of intermediate areas
- share of predominantly urban areas
- share of population in predominantly rural areas X
- share of population in intermediate areas X
- share of population in predominantly urban areas X
- urban areas at the expense of agricultural areas
- urban areas at the expense of agricultural areas (per km²) X
- economic areas at the expense of agricultural areas

- economic areas at the expense of agricultural areas (per km²) X
- agricultural areas at the expense of other areas
- agricultural areas at the expense of other areas (per km²) X
- forest areas at the expense of other areas
- forest areas at the expense of other areas (per km²) X
- importance of Leader action groups X
- water use X

Environmental conditions

Although in the competition section there are some environmentally driven indicators (those that define competition issues), additional indicators are included here, namely:

- share of UAA under organic farming X
- share of UAA for extensive arable crops X

- share of UAA for extensive arable grazing X

4.4   Results of the cluster analysis

4.4.1   Overview

A 6-cluster, 7-cluster and 8-cluster model was calculated using the Ward method (see Annex 1) with the latter being the most significant. In the 8-cluster-model which was judged as the most significant one these numbers of NUTS 2 regions can be found (257 regions included) as Table 25 illustrates. 10 Community and Norwegian NUTS 2 regions could not be included due to a lack of data.

Table 25   NUTS 2 regions per cluster

Cluster Nr.	NUTS 2 regions
1	39
2	34
3	51
4	17
5	45
6	21
7	42
8	8
sum	257
Not enough data	10

The complete list of indicators means can be taken from the annex. In the following chapters their attributes will be described in detail.

4.4.2   Cluster 1

These regions do still dispose of some agricultural production, but its economic relevance is marginal. However, except for urban agglomerations, agriculture ist still the dominant land use. GDP per head is high at 114% of the EU average in PPP. The few farmers that remain mostly have diversified or other gainful activities. These regions have by far the most important level of secondary activities (per farm more than 50%). There are extremely high population densities which potentially causes competition for land.

Most of the UK regions are gathered here besides two French ones. Additionally, Brussels and the Northern metropolitan regions Etelä-Suomi (Helsinki and around) and Stockholm are included. There are 39 regions in total. These regions are classified as the *post-agricultural regions*.

Cluster specifics[21]

- very high population density
- high GDP in pps per capita
- low share of GVA in primary sector
- high share of GVA in tertiary sector
- low share of employment in Primary sector
- high share of employment in Tertiary sector
- decrease of employment in Tertiary sector (!)
- very high share of 25 to 64 year old participating in education and training
- low share of (population in) predominantly rural areas
- high share of intermediate areas
- low share of (population in) intermediate areas

- high share of (population in) predominantly urban areas
- high share of holders with other gainful activity
- high importance of secondary farm activities (per GVA agri)
- low importance of Leader action groups
- high importance of industrial crops (per GVA agri)
- low share of employment in food industry
- very strong increase of total number of bed places in %
- share of UAA for extensive arable crops = 0

4.4.3   Cluster 2

These regions are about as heavily urbanised as the post-agricultural regions. The main differences is that these have a relatively stable primary sector with a high share of trained farmers and a very low importance of secondary or other gainful activities. The combination intensive agriculture – highly urbanized reminds oneself of the inner ring of the Von Thünen model (see conceptual considerations). On the other hand, because of urban sprawl, many formerly agricultural areas get turned into urban or economic areas nonetheless which implies together with an increase in primary sector employment (!) that the remaining areas get intensified. GDP per head is very high at 124% of the EU average in PPP.

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[21]   Whereas "high" and "low" always has to be seen in relation to the other clusters of the same series.

All Dutch and Belgian-flemish regions are included in this 34 region cluster together with most of the NUTS 2 large agglomeration regions that were not included in the post-agricultural regions (Luxembourg, Île de France/Paris, Prague, Berlin, Hamburg, Athens, Madrid, Vienna, Bratislavsky kraj, Kozep-Magyarorszag/Buda-pest). The regions in this cluster are christened the *peri-urban agricultural regions*.

Cluster specifics

- small regions (on average!)
- high population density
- very high GDP in pps per capita
- low share of GVA in secondary sector
- high share of GVA in tertiary sector
- low share of employment in Secondary sector
- high share of employment in Tertiary sector
- (low) increase of employment in Primary sector (!)
- low share of (population in) predominantly rural areas
- low share of (population in) intermediate areas
- high share of (population in) predominantly urban areas

- high share of managers with agricultural training
- low share of holders with other gainful activity
- low importance of secondary farm activities (per GVA agri)
- low share of employment in wood industry
- decrease of total number of bed places in %
- high increase of urban areas at the expense of agricultural areas (per km²)
- high increase of economic areas at the expense of agricultural areas (per km²)

4.4.4   Cluster 3

These regions are not very much specialised in a single activity. Also in the cluster analysis, they have relatively few similar indicators. They are neither very rural nor very urban, they have high shares of both secondary and tertiary sectoral activities with the employment in industry very much decreasing (many traditional rural industrial regions). Farmers are usually well trained but most have additional jobs in industries or services, also secondary farm activities are very important. GDP per head is almost exactly EU average in PPP (98%).

Most German regions except for the largest cities are in this cluster, additionally most French regions can be found here apart from two Belgian and one Polish region, which ads up to 51 regions. These regions are subsequently called *"side-by-side" regions*.

Cluster specifics

- strong decrease of employment in Secondary sector
- high share of (population in) intermediate areas
- very low share of (population in) predominantly urban areas
- very high share of managers with agricultural training
- high share of holders with other gainful activity

- high importance of industrial crops (per GVA agri)
- high number of nights spent per inhabitant (non hotel)
- share of UAA for extensive arable crops = 0
- low share of UAA for extensive arable grazing

4.4.5   Cluster 4

These regions are the "stand alone" transition type par excellence. They have low GDP in PPP but a strongly growing overall economy. The primary sector diminishes rapidly although it is still strong. Emigration from the regions is strong, the brain drain is completed by a low share of people participating in post-gradual education. Secondary farm or off-farm activities are not very important, arable cropping and grazing is only extensive in many cases.

These are the only regions with a negative migration rate, as GDP per head is very low at 34% of the EU average in PPP. In this cluster one can find almost all Romanian and Bulgarian regions and a number of Polish regions, 17 in total. Consequently, these regions are named the *"stand-alone" agricultural regions*.

Cluster specifics

- low population density
- low GDP in pps per capita
- strong increase of GDP in pps per capita
- high share of GVA in primary sector
- low share of GVA in tertiary sector
- high share of employment in Primary sector
- low share of employment in Tertiary sector
- strong decrease of employment in Primary sector
- strong increase of employment in Secondary sector
- strong increase of employment in Tertiary sector
- negative net migration crude rate (per 1000)
- low share of 25 to 64 year old participating in education and training

- high share of (population in) predominantly rural areas
- high share of (population in) intermediate areas
- low share of (population in) predominantly urban areas
- low importance of secondary farm activities (per farm)
- high share of employment in food industry
- low number of nights spent per inhabitant
- very high share of UAA for extensive arable crops
- strong increase of total number of bed places in %
- high share of UAA for extensive arable grazing
- water use – low

4.4.6   Cluster 5

In this cluster the "stand alone" role of agriculture has already been changed to some extent as the transition to a diversified economy, to secondary and tertiary activities is in full operation. Food and wood industry are strong which offers increasing possibilities for integration activities and mirrors itself in a high importance of LAGs. Out-migration has already stopped. GDP per head in PPP is already approaching the European average at 65%.

In this cluster, mainly regions that faced a rapid economic development in recent years can be found, most obviously these are mainly located in the countries of the 2004 enlargement, Ireland and Spain, all countries with very weak economic positions until the 1980s to 1990s. 45 NUTS 2 regions can be found in this cluster. Due to their dynamics these regions are classified as the *regions in transition*.

Cluster specifics

- low population density
- low GDP in pps per capita
- strong increase of GDP in pps per capita
- high share of GVA in secondary sector
- high share of employment in Secondary sector
- high share of (population in) predominantly rural areas
- high share of (population in) intermediate areas

- low share of (population in) predominantly urban areas
- very high importance of Leader action groups
- high share of employment in food industry
- high share of employment in wood industry
- low share of UAA for extensive arable crops

4.4.7 Cluster 6

These regions are very large, with low densities and a high share of predominantly rural areas. Extensive grazing and forestry are the most typical primary activities, arable crops are of minor importance and so is water use. The share of area under organic farming is the highest of all clusters. Other gainful activities are important, so are secondary activities (per farm). Post-gradual training is of high importance, the number of bed places and the number of nights spent per inhabitant are the second highest of all clusters. GDP per head is high at 104% of the EU average in PPP.

The 21 regions that can be found in this cluster are Austrian, Slovenian and Scandinavian (mostly very) rural regions. These regions are referred to as the *extensive high-nature value/tourist regions*.

Cluster specifics

- very low population density
- large regions (on average!)
- high share of (population in) predominantly rural areas
- low share of (population in) intermediate areas
- low share of (population in) predominantly urban areas

- high share of UAA under organic farming
- very high share of holders with other gainful activity
- high share of employment in wood industry
- very high share of UAA for extensive arable grazing
- water use – low

4.4.8 Cluster 7

These regions show similarities to cluster 6 with the major difference that the agriculture is more diverse in these regions (higher importance of arable crops) and the tourism is much more intensive (very high number of bed places, very strong increase of bed places, very many nights spent). Both factors apparently cause the highest relative water use of all clusters, as does the higher degree of urbanization. GDP per head is average at 93% of the EU average in PPP. It is important to stress that these regions do mostly not necessarily have an intensive agriculture but rather, indicated by the high level of organic farming, an extensive one (only intensive tourism!).

In this cluster one can find almost all Greek and Italian regions, Cyprus and Malta besides a selection of tourism intensive regions from other countries such as Tirol, Rhône-Alpes, Illes Balears, Canarias and Algarve. In total there are 42 regions. To distinguish the regions from cluster 6, these regions are called *intensive high-nature value/tourist regions*.

Cluster specifics

- strong decrease of GDP in pps per capita
- high net migration crude rate (per 1000)
- high share of (population in) predominantly rural areas
- high share of (population in) intermediate areas
- low share of (population in) predominantly urban areas

- low share of managers with agricultural training
- high number of bed places per inhabitant
- very high number of nights spent per inhabitant
- high number of nights spent per inhabitant (non hotel)
- water use – very high

4.4.9   Cluster 8

The regions to be found in this cluster are a special case as they are the most heterogeneous. Agriculture is relatively strong although the regions are more urbanized than most other clusters. The most stunning discovery is that urban/economic areas as well as agricultural areas have been expanded extremely during the 1990-2000 decade, logically in total this happens at the expense of natural areas. In-migration is high as is water use. So it can be stated that intensification of urbanization as well as of agriculture take place at the same time. GDP per head is below EU average at 81% in PPP but strongly increasing.

Only four Spanish, three Portuguese and one Romanian region can be found in this cluster which is the smallest of all. These regions are named the *intensifying agricultural regions*.

Cluster specifics

- strong increase of GDP in pps per capita
- high net migration crude rate (per 1000)
- very low share of managers with agricultural training
- very low importance of industrial crops (per GVA agri)
- high increase of urban areas at the expense of agricultural areas (per km²)

- high increase of economic areas at the expense of agricultural areas (per km²)
- very high increase of agricultural areas at the expense of other areas (per km²)
- very high increase of forest areas at the expense of other areas (per km²)
- water use – high

4.4.10   Lessons learnt from the cluster analysis

The geographical distribution of the eight clusters across Europe shows an interesting pattern. There are as well political and economic as geographical influences. While the *post-agricultural*, *side-by-side*, *stand-alone* and *in transition* regions seem to follow national borders (to be explained partly by the state of development), the other types are more constrained by environmental factors

(climate, relief, beauty of the landscape). The first conclusions before taking another look at the case studies in chapter 5 can are as follows.

There are rather two types of urbanised regions regions than one that can be clearly distinguished, one being highly populated but rather a mix of rural and urban areas (cluster 1: „post-agricultural regions"), one being clearly urban but having a very profitable agriculture nonetheless (cluster 2: "peri-urban agricultural regions").

The transition regions can also be clearly distinguished into cluster 4, the "stand-alone agricultural regions" that still have a very traditional agriculture and others that are already in full transition with a move to secondary and tertiary activities and an increased level of networking activities (cluster 5: "regions in transition"). The logical successor to the stand-alone regions after economic transition are the cluster 3: "side-by-side regions" where the secondary and tertiary sector have already taken over the major part of productivity and no major integration steps between sectors have been taken.

The "high-nature value/tourist regions" from the conceptual phase can be distinguished very clearly in two differtn types: is a division between cluster 6: "extensive high-nature value/tourist regions" where tourism is important but not highly important (gentle tourism) and cluster 7: "intensive high-nature value/tourist regions" where tourism has mainly taken over, all of the latter being Mediterranean summer resort and winter sports regions. Both types are mainly located in Mediterranean, Alpine or Scandinavian areas, have important forestry and side activities (rural tourism).

The regions where high-quality soils cause conflicts with the environment could not be clearly located due to non-existent data on statistical regional level. It has to be stressed though that in the majority of regions this is a local phenomenon as soils tend to be heterogeneous in the EU regions. Nonetheless, the cluster of the cluster 8: "intensifying agricultural regions" shows similar characteristics, as these are regions that are generally favourable for large-scale agriculture. They are quite urbanised at the same time.

Map 4 shows the eight clusters distinguished in Europe and described previously. As is can be seen, most of the assumed paths of development from the conceptual stage can be found again in the clusters. As harmonised statistical data is on active local networking is very sparse (only the number of LAGs was included), one cannot draw clear conclusions on the level of activities in the regions. The more so, as the quality of local governance cannot be estimated from the number of LAGs alone. Regional networking is for sure a questions of regional knowledge and has to be explored locally (the case studies will be used for that in the subsequent chapter). Therefore, the former "High nature value/tourist and networking regions: integration of all activities", now christened "fully integrated regions", have to stay on the hypothetical level but will be further explored in chapter 5. It has to be stressed once more that these clusters are calculated using statistics and there are for sure a number of regions in each cluster that cannot be allocated to a certain type of regions in reality. Additionally, the NUTS 2 level of investigation does in many cases not reflect the diversity within one region. However, as an innovative

approach to address different types of rural integrated development the method proved to be a successful starting point. All paths of development have advantages and disadvantages which will be deepened in chapter 6.

Map 4   The 8 TERESA clusters of rural integration paths
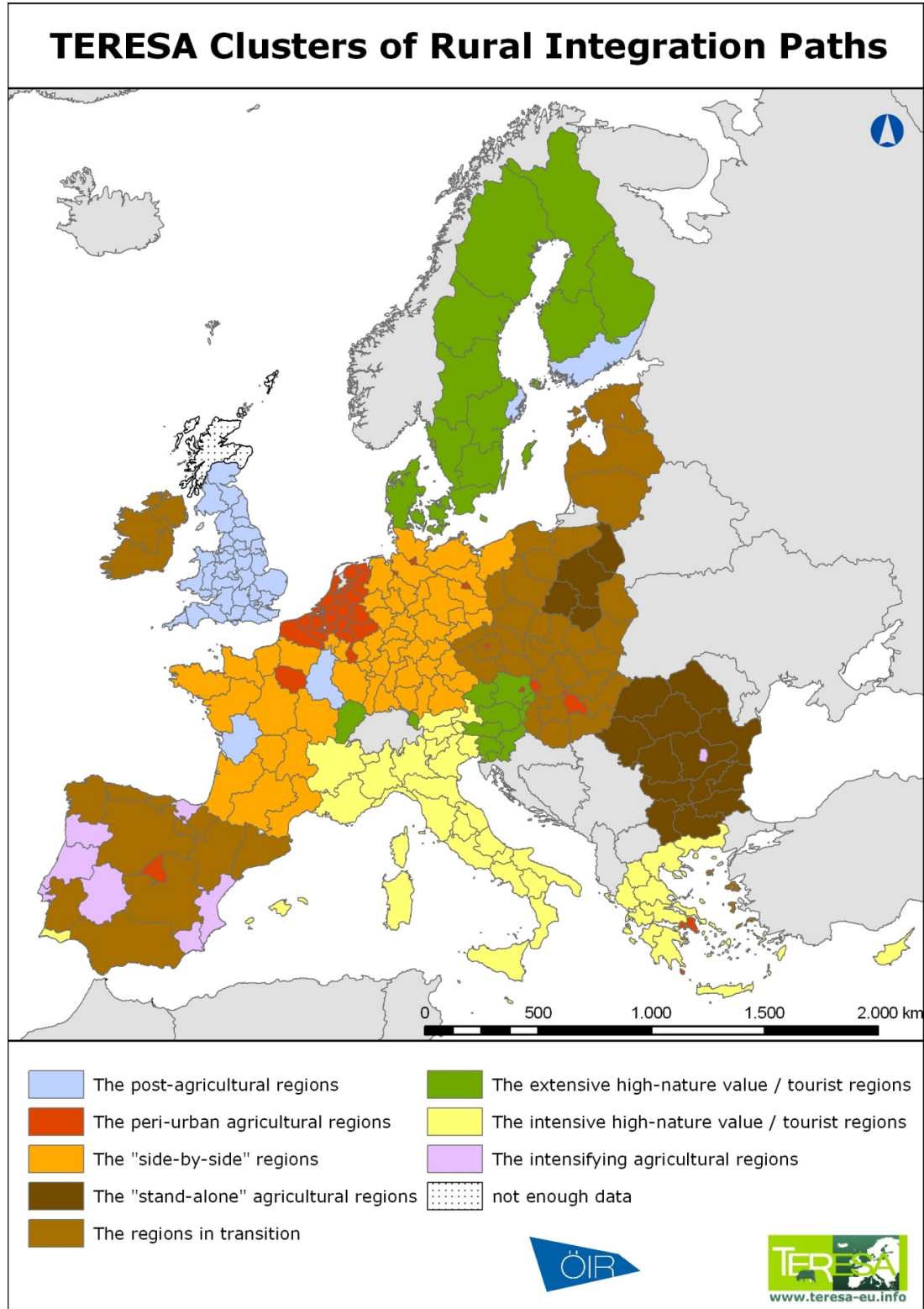
Note: intensive high-nature value/tourist regions do not necessarily have an intensive agriculture!

Source: ÖIR

5   TESTING THE RESULTS

5.1   Integration patterns and the case study regions

At this point, the awareness has to be raised that there is probably not a single region – at least on NUTS 2 level of investigation, to which a clear TERESA basic integration pattern coexistence – competition – cooperation, can be allocated. In contrast, in every region there will be hints of all three patterns, but in most cases, either a coexistence situation or an evolution in one of the other two patterns will be spotted. By having a look at the case studies the evidence of this evolution gets tested in the following sections.

As early as at the TERESA Berlin workshop on October 9 2008, a first estimation by the case study experts was made how the 11 case studies could fit into this scheme. It has to be kept in mind that this is purely based on the qualitative knowledge about the regions from the case studies and just an input into discussion (Figure 51).

Figure 51   Estimated classification of integration types for the case study regions
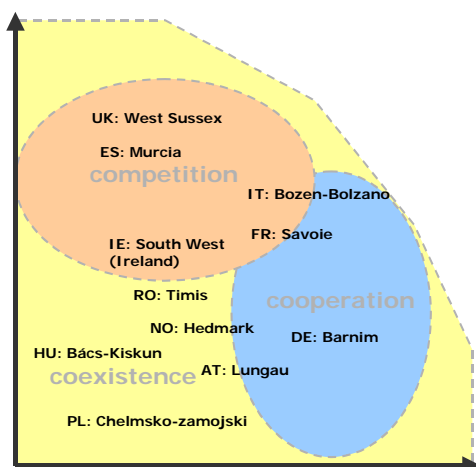
Building on this, by plotting the distribution of the types of supply chains in the same way as in chapter 3.4.1 "Types of supply chain and regional development" (Figure 37) according to this first integration type draft, the following features can be made out (Figure 52):

➔ Urban regions and "consumer-driven" supply chains are often in a mixed competition-cooperation pattern. Indeed, the cooperation pattern has only been observed in this situation. It seems that the opportunity to develop short supply chains in urban areas is a way to avoid competition, with an adaptation of agriculture to an urban or peri-urban context.
➔ Urban regions and "standard" products are always in a competition pattern. This is the case either for supply chains based on international markets, or for those who develop geographical attributes to the consumer.

➔ Rural regions of developed economies and standard supply chains are either in a coexistence or in a competition pattern. Though agriculture has a more important weight in the employment, it seems, as a kind of paradox, that it is relatively little integrated in the regional development of rural areas, compared to tourist areas especially.

➔ tourist regions & specific product supply chains are in a competition-cooperation pattern: agriculture mobilizes specific resources, integrates within local actors networks, has a small direct contribution to employment but an important contribution to the quality of life (liveliness, culture, landscape, etc.). This cooperation "side" is counterbalanced by competition on the land use, on the workforce market, etc.

➔ Rural regions of transition countries and standard supply chains are in a pattern of co-existence (specific products are very seldom in these regions). A lower level of urbanisation and of purchasing power makes it probably more difficult to develop specific products dedicated to high value added markets, or other activities linked to tourism for instance. The main impact of agriculture is its weight in the local employment and seems to be "reduced" to its food supply contribution. In some cases, these standard supply chains have mainly a local market consumption.

Figure 52　　Distribution of the type of integration pattern for each supply chain, according to the type of regional development
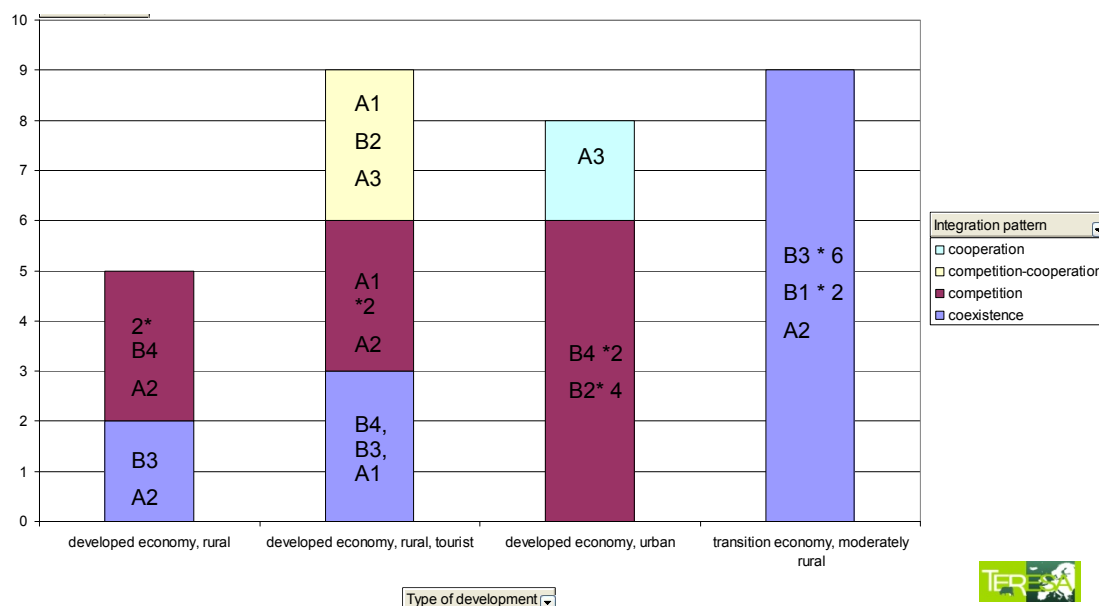
Note: Specific products are *A1* traditional and typical products, *A2* products identified by their territory and *A3* consumers-driven products; standard products are: *B1* standard products of local consumption, *B2* standard products with geographical attributes for the consumers, *B3* standard products with a regional or national market and *B4* standard products with an international market (cf. chapter 3.1 Main characteristics of the supply chains).

5.2   Clusters of rural integration paths and the case study regions

5.2.1   Post-agricultural regions

The case study region of West Sussex that is part of the post-agricultural NUTS 2 region Surrey, East and West Sussex, proves to be a very good example for this type. GDP is very high, agriculture as a whole is the lowest contributor to total GDP of all case study regions. The agriculture that remains is highly productive nonetheless. The average physical farm size is high, the average economic farm size is very high (economies of scale).

Most farms earn their livings on one hand of intensive production of foodstuffs (e.g. vegetables which are also a result of the comparatively favourable soils and climate) that is highly demanded in the south of England due to the very urbanised and densely populated structure (close proximity to huge numbers of consumers). The level of agricultural technology and adding value to primary products (e.g. prepacked salad) is well developed. On the other hand, there is a very substantial and diverse contribution of non-agri activities to farm incomes, such as letting buildings and land, which is also owed to the densely populated area. Some farms even specialise in very urban manners (e.g. farms entirely dedicated to the amusement of children). As regards the deepening of the food supply chains, local specialities (e.g. "Taste of Sussex") and organic food is more and more booming and becoming sought after.

On the other side of the coin, urbanisation and economic strength brings along that food retail is controlled by a number of supermarket chains and agriculture gets more and more abandoned (especially less profitable sites) due to more attractive forms of income. Nonetheless, pressure on certain natural and agricultural areas is expected to further increase due to the urbanisation and the very profitable profitable agriculture. Fortunately, again due to the urban nature of the region and the state of economic development, environmental protection schemes are well developed.

Local network communities in rural West Sussex are present but there seems to be no intensive yearning for new cooperation models a reason being probably the competitive tradition of Britain's economy.

5.2.2   Peri-urban agricultural regions

None of the TERESA case study regions is located in the peri-urban agricultural cluster. The classic examples for this type would be Dutch regions and rural areas immediately surrounding large agglomerations, where most of the country area is urbanised but still there are some very intensive agricultural production spaces (greenhouses…) in between. However, at least traces of this type can be spotted in the fully developed case study regions that are close to large agglomerations, where similar attributes can be found in some local areas of the NUTS 3 regions.

Some sub-regions of the case study West Sussex are specialised on the intensive production of food for Greater London. As indicated before, especially the areas with the best soil are used.

To some extent, also the Barnim case study regions that borders Berlin shows peri-urban agricultural characteristics; but due to the low-quality soils and the economic transition status farmers there have specialised on extensive organic growing to provide quality-conscious residents of the German capital with biological foodstuffs.

5.2.3   "Side-by-side" regions

But by cluster-statistical nature, Barnim, part of the NUTS 2 region Brandenburg – Nordost, is a side-by-side region. The distribution of the three economic sectors is about average compared to the rest of the case studies, nonetheless the secondary sector has been diminishing rapidly. There is also a very high unemployment rate. Agriculture did not yet digest the transition of the former GDR to a market system, the farm sizes are huge (owed to the former system of LPG collective farms), but despite this scale advantage, only partly successful.

Many efforts have been made in recent years to strengthen the vital rural community to mixed results: some farms have specialised in organic production cooperating with processing and sales firms (such as the huge dairy "organic village" of Brodowin visited by the TERESA team in 2008), and many offer horse riding. With "Barnim Nature Park" and "Biosphere Reserve Schorfheide-Chorin" two important recreation areas have been established. Future diversified strategies that promise to be successful due to the large unities are energy crops and wood production.

In conclusion, one has to state that Barnim is not a typical example for a side-by-side region which can be traced back to mainly two characteristics:

➔   The historical situation of being a socialist economic system until 20 years ago and
➔   the proximity to Berlin.

While the average region in the federal state of Brandenburg (NUTS 1) can be classified as *side-by-side* in good conscience, Barnim is in reality a mixed form of a *side-by-side* and *peri-urban* region with *extensive high-nature value/tourist* region elements.

5.2.4   "Stand-alone" agricultural regions

The TERESA case study that is located in a *stand-alone agricultural* NUTS 2 region (Romanian Vest) is Timiş. GDP by European average is very low, but the economy is strongly growing, with the tertiary and especially the secondary growing on the cost of agriculture. Emigration from the regions is very strong despite the growth of the economy.

Many farms do not even have a legal status (yet), semi-subsistence farming is still important and extensive forms of agriculture are widespread. Secondary farm or

off-farm activities are practically not existing or only in the fledgling stages, productivity in agriculture is low although there are partly good soils.

There are very few links between agriculture and other sectors. As the environment is not very diversified in most of Timiş, there are also little efforts in attracting tourists to the countryside.

5.2.5   Regions in transition

There are three case study regions that are located in the *transition*-type cluster: Chełmsko-zamojski is the NUTS 2 region Lubelskie, Bács-Kiskun in Dél-Alföld and South West in Southern Ireland. These are not really homogeneous anymore, as the Irish region faced a massive economic upturn in recent years. But as GDP per head is not the only criteria in this cluster, there are nonetheless notable similarities (increase of GDP, high share of the secondary sector notably).

In all of these regions, compared to Timiş for example, the transition to a diversified economy is much more advanced. However in agriculture, the Irish region is already very diversified with aquaculture, rural tourism and direct marketing being important income sources.

In all three regions, there are considerable areas looked after by Local Action Groups. The establishment of LEADER generally was more warmly welcomed in the states that became member from the eighties up to today, although the success varies considerably.

As the economic power in the sense of GDP which defined this cluster is not used in TERESA as a knock-out criteria (as in Objective 1 regions for instance), it might not make sense to split this region type because of the differing Irish situation (in some Spanish regions, for instance Catalunya, Navarra or Rioja, the situation is alike). It is rather the status of emerging cooperation patterns between actors that would be a reasonable criteria.

5.2.6   Extensive high-nature value/tourist regions

The only extensive high-nature value/tourist region in the sample would be Norwegian Hedmark. One might have expected the extensive and Alpine regions Savoie, Bozen-Bolzano and Lungau in this cluster in the first place, but the high number of tourist beds and the very high water use shifts these into the intensive cluster.

For the NUTS 2 region Salzburg, however, the most intensive tourist areas are located outside of Lungau, so the NUTS 3 region of Lungau rather belongs to the extensive type region.

Both regions in Question, Hedmark and Lungau, possess vast natural areas, mainly mountain ranges and mountain forests. Besides, especially in Lungau, mountain extensive pastures play a high role. Tourism is developed in both regions: more than 100 bed places per 100 inhabitants but not many bed places in absolute

numbers. Both regions offer winter sports as well as summer recreation, but both on a small scale compared to Savoie or Bozen-Bolzano. They have an intact attractive environment that is only sparsely populated and no larger cities, but nonetheless organic farming is more important than the absence of markets nearby (especially Lungau) would let one expect.

The economic development is on a high level for the rural nature of the areas.

5.2.7   Intensive high-nature value/tourist regions

The regions in the NUTS 2 regions of this cluster, Savoie and Bozen-Bolzano (except for Lungau, see the *extensive high-nature value/tourist regions*) show a much higher tourism intensity than the former type of regions. In fact, tourism is in both regions the major economic driving force. Both regions have around 200.000 bedplaces at only 400.000 (Savoie) and 500.000 (Bozen-Bolzano) inhabitants. Nonetheless, they manage to keep most of their territory in a pleasant and diversified environmental condition (except maybe for some major skiing resorts such as Val d'Isère) as it is their main capital for attracting tourists.

Most interestingly, as opposed to the extensive regions, in both areas organic production is of very little significance, although the starting position are very much the same. Water use, especially in Bozen-Bolzano, is very high.

5.2.8   Intensifying agricultural regions

Although there are only few regions in this cluster (mainly because of the high territorial level of analysis, see chapter 3), Murcia is a very good example.

Agricultural areas – mainly greenhouses, olive plantations and other intensive horticulture and permanent crops – increase their areas and provide a stable economic income. On the other hand, residential areas get very much expanded as Murcia is located in a very pleasant climatic and coastal area.

5.3   Lessons learned from testing

In general, the results of the cluster analysis proved to be a very appropriate tool for picturing the diversity of European regions in rural development on Community level. For all case study regions but one, the classification is considered appropriate, mostly very appropriate, even though in one case local knowledge was required to estimate a regions position (Austrian Lungau is a rather extensive than intensive high-nature value/tourist region).

What is to be said is that the NUTS 2 level that was chosen according to data availability is to high to clearly identify the local patterns. NUTS 3 will be as well in many cases, and apart from that the regional administrative systems may have to be considered (NUTS 3 is a statistical unit only in many countries). On the other hand, a more local level of analysis is not feasibly for policy programming. It is more important to provide a framework for the regional identification of regional

needs that can be deepened at local level similar to the (mostly national) SWOT analyses in the current programming design.

A round of feedback between the basic types of integration – coexistence, competition, cooperation and territory – and the regional cluster typology would read as in Table 26. As the method cluster typology was a result of the hypothesis on the basic types, there is of course a clear coherence. Nonetheless, the table contributes to the picture of diversity that European agriculture that the TERESA project highlights.

Table 26   Allocation of integration patterns to types of regions

| type of region | predominant type of integration | | |
	coexistence	competition	cooperation and territory
developed, urban	"side-by-side regions"	post-agricultural regions peri-urban agricultural regions	post-agricultural regions
developed, rural	"side-by-side regions"	intensifying agricultural regions	
developed, rural, tourist		intensive high-nature value/tourist regions intensifying agricultural regions	extensive high-nature value/tourist regions intensive high-nature value/tourist regions
transition economy	"stand-alone" agricultural regions regions in transition	potentially: regions in transition (depending on their pathway)	potentially: regions in transition (depending on their pathway)

5.4   Experiences from agent-based modelling

In the TERESA project, an Agent-based model was introduced (WP 3[22]) to explore the role that the diversity of rural regions and the farming sector plays in making the region resilient against external influences (shocks and shifts). The terms 'diversity' and 'resilience' are often referred to as desired characteristics for agricultural systems in a rural setting, both in developed and developing countries. With increasing uncertainties due to climate change, changing trade flows due to globalisation and an increased pace of technology development and transfer, these concepts have recently become dominant issues in theories on rural development (Ellis and Beggs 2001). In the TERESA agent-based model, the analysis of resilience was based on the supply chains that were explored in the case studies using detailed questionnaires (cf. deliverable "D 2.2 STANDARDISED DESIGN FOR THE CASE STUDIES").

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[22] For detailed results see deliverables D.3.1 THEORETICAL FRAMEWORK AND IMPLEMENTATION and D.3.2 REPORT ON DIVERSITY AND RESILIENCE OF RURAL AREAS – SUMMARY OF EMPIRICAL RESULTS AND CONCLUSIONS

Figure 53   Types of resilience in rural development
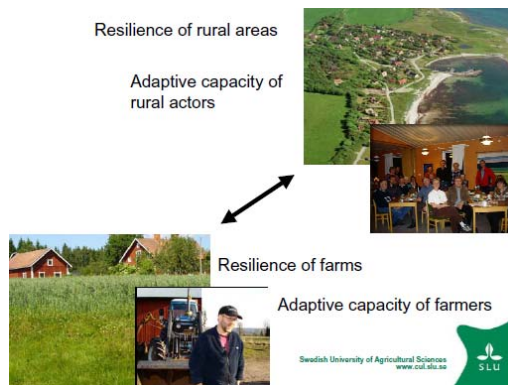
Source: Milestad, R. (TERESA conference presentation)

The key hypothetic questions to be answered by modelling are:

➔ Has the level of diversity a positive impact on the resilience and robustness of agricultural systems?

➔ Does the function (and thus also performance) of agricultural supply chains at the time of a stress impact the resilience and robustness of these systems?

➔ Do behavioural responses towards stresses determine the resilience and robustness of agricultural systems?

Diversity was measured using Stirling's (2007) diversity heuristic. There are two qualifications to its universal applicability of the supply chain focus in comparison to measuring diversity in a farm level. First, there is a loss of information with regard to the diversity of individual farmers and other supply chain actors that could have an impact on the dynamic system properties of rural regions. Second, the diversity heuristic only considers the contribution of the agriculture-related sectors to the dynamic system properties of the region and does not consider the contribution of non-agricultural sectors like the building industry and services.

The concept of resilience has been operationalised using a theoretical framework developed by Stirling (2008), which suggests that the dynamic system properties of a system depends on the actors' perceptions, and base on these, their beliefs and intentions with regard to the stresses a system could face. The modelling focused on actors' responses to stresses that are outside the sphere of influence (e.g. climate change, global political changes, international trade issues or worldwide pandemics).

These three hypothetic questions were all falsified using the regional case studies as context for exploration: The *level of diversity seems not to be a determinant for the resilience and robustness* of supply chains. However, behavioural responses do not seem to determine the dynamic system properties of agricultural supply chains either, although the dynamic system properties vary widely depending on what decision rule module is implemented. In other words, the effect of stresses is largely dependent on what type of of decisions are taken by the actors, however there is no single decision rule that provides higher resilience or robustness in all

case studies. Finally, the results show that the performance of the system at the time of the stress does impact the resilience and robustness of the system.

The first hypothesis was tested using six different case studies of rural regions in Europe. The results show no or limited relationships between the level of diversity at the time of the stress and the consequences for the system. This suggests that two other factors might influence the system's ability to cope with stresses:

1. the function of the system at the time of the stress, and
2. the behavioural responses of the regional actors.

Furthermore, it is also shown that changes in land use have only limited effects on the overall diversity levels within the agricultural systems. An *important influence* on the diversity levels is the *processing, wholesaling and retailing capacities within the region*. Changes in these stages of the agricultural supply chain show often substantial impacts on the overall diversity of the agricultural system in the region.

The second step explored the impact of a systems' function on the resilience and robustness of agricultural systems. We assumed a system's function, defined as the overall performance of the agricultural supply chain at any point in time, did not affect the resilience or robustness of the region. If this hypothesis is true, then a change in the direction of the shock or shift should not give any different conclusions about the resilience or robustness of the system. Thus, if an evolutionary pathway is resilient towards a positive shock, it should also show resilience when faced with a negative shock.

The results showed that reversing a shock or shift's direction (from positive to negative) did not lead to different conclusions for some decision rule modules, but lead to large changes in the resilience and robustness of other decision rule modules. When faced with shocks, the 'habitual' decision modules (which assume supply chain actors that base their decisions on historical information) perform well, but for both case studies included in this particular analysis they produce average results when faced with shifts. These results would suggest that actors who base their decisions on historical information (rather than forward looking) are better in dealing with temporary shocks. However, such systems are not good in adapting to new situations with permanent changes. The 'deliberate' and 'imitation' modules show mixed results. The 'deliberate' modules (assuming actors instantly changing their operations when faced with changes in their environment) perform robust when faced with positive shifts, but performs worst when faced with negative shifts. 'Imitation' modules (assuming actors that imitate each other), on the other hand, perform well when faced with negative shifts and underperforms when faced with positive shifts.

In summary, the results show that *a system that is resilient or robust to one form of shock or shift is not necessarily resilient to other forms of shocks and shifts*. Thus, the results showed that structure and decision rules are not the only determinants that affect the resilience or robustness of a system, but that a system's function at the time of the stress might also have an influence on the dynamic system properties of the system (resilience and robustness in this case). In other words, decision rule modules or diversity might be important determinant

for the resilience and robustness of agricultural systems, but *one should also consider the relationship between the functions of a system at the time of the shock or shift and the characteristics of the stress itself*.

Van der Ploeg and Roep (2003) indicated the importance of farm responses, farming styles and farmer behaviour on the process of diversification and multifunctionality. They found that farms who are less cost oriented seem to be more susceptible to switch their farming system and to incorporate other functions in their behaviour. The final set of experiments explored the relationship between decision rule modules and the dynamic system properties of agricultural systems. The stresses where introduced at the initialisation of the model, which means that at the time of the stress the function and level of diversity was the same for each evolutionary pathway. The only difference was the decision rule modules associated with each pathway. The results show that there is no single decision rule module that provides the highest resilience for both case studies. Similarly, there is no single decision rule module that provides the highest robustness. This suggests that the function and structure at the time of the shock, which is different between the different regions, affects the resilience of these systems.

The final conclusion of these three sets of experiments is that resilience and robustness of agricultural systems cannot be reduced to

   (a) the level of diversity of a system,
   (b) to the behavioural responses of actors to a stress or
   (c) to the functioning of the system at the time of the stress.

Instead, these results suggest that the *interactions between decision rules*, their *effect on the function* (or performance) of the system and *the subsequent effects of the performance on future decisions* plays an important role with regard to the resilience and robustness of agricultural supply chains. Thus, it is the interaction between function and decision rules that provides a system's ability to cope with stresses.

6   CONCLUSIONS

6.1   Advantages and disadvantages from diversification and improvement of environment and countryside

The TERESA supply chain and cluster analyses and the TERESA agent-based model provides us with two main conclusions on diversification:

➔ Rural diversity takes place on two basic levels as was already laid out in TERESA deliverable D 3.2 DIVERSITY AND RESILIENCE OF RURAL AREAS – REPORT and in chapter 1 of this present deliverable: *diversity of the rural economy at regional level* can be a very successful strategy for providing vital rural regions that manage to keep up pace with today's knowledge society. *Diversification at farm enterprise level* can help to provide new sources of income and augment otherwise stagnating agrarian incomes which subsequently facilitates the ongoing provision of public goods through agriculture.

➔ *Diversity should not be considered as an end in itself*. There are agricultural supply chains and regions alike that can perform well and be resistant to external influences without major diversification activities. Their success on one hand depends on the way decisions are taken and by which dynamics they develop over time, and on the other hand on appropriate instruments to avoid negative external effects in case of unsustainable resource consumption.

Consequently, the improvement of the environment and the countryside can function as a very strong foundation that makes increasing sustainable use of endogenous resources and makes certain diversified activities possible in the first place.

Diversified regions can provide a desirable living and working environment due to the proximity of different products and services. This, in return, can maintain or improve the quality of life in rural regions. Greater regional diversity leads to greater regional economic stability as fluctuations in incomes and employment opportunities diminish because downturns in sectoral economies have a much less disastrous impact on a diversified economy than on a specialized one (Wiskerke 2008, TERESA conference presentation). A conclusion that was drawn as early as 1930 by McClaughlin:

> *"… since no two businesses have exactly the same seasonal and cyclical swings, the more types of production and trade are represented, the more stable will be that community's business".*

The economically least diversified case studies – Chełmsko-zamojski, Lungau and Bács-Kiskun – are the regions that faced the most notable population decline, relatively independent from their general economic dynamics. All three regions are of very rural nature and do not have immediate access to larger cities. The two economically lagging region, where agriculture is still very traditionally organised (many semi-subsistance farms) also faced a rapid decline in agricultural

contribution to GDP over the last years. Timiş, another economically lagging region, managed to stop the population decline after the accession due to the strong economic dynamics and the growing diversification of the Timişoara agglomeration, mainly in the industrial sector. On the other hand Lungau, where the agricultural sector is comparatively diversified (high importance of forestry, land management and agrotourism), managed to keep the development of the primary sector stable.

The most diversified regions, measured by the variety of all economic activities, are probably West Sussex, Savoie and Barnim. In all three regions, employment in agriculture is below 3% and the service sector is by far the strongest. All three regions have comparatively high population growths.

But the highest growths of all regions, concerning economy as well as population, can be found in Murcia and South-Western Ireland. This is remarkable, as both regions have relatively weak links from agriculture to local development. Murcia has, as far as economic power of agriculture is concerned, a very competitive intensive agriculture that is oriented at international markets besides the presence of two major urban nodes and an important role of the residential and tourism functions. In the Irish region, which is also very strong in agricultural exports (mainly beef and dairy products), farmers mainly look for off-farm work due to the many jobs created in the secondary sector in recent years.

On the negative side, a positive performance in terms of competitiveness and a vital countryside can generate a series of problems. Attractive recreational and living areas can be very successful. However, due to their success, land and building prices are increasing quickly and substantially. This implies that for some people it might become too expensive to continue living in the area and new contradictions emerge. An increase in the quality of life for some actors might therefore imply a decrease for others. Again Murcia stands out, as the economic dimension of competitive agriculture and urban land use threats social cohesion and environmental standard. Another point would be that from a local knowledge or 'learning regions' perspective too much diversification may also be counterproductive in terms of innovation and regional competitiveness as local assets get lost.

In terms of diversification at farm enterprise level it has to be pointed out that there is much evidence that diversification of economic activities is desirable (Wiskerke 2008, TERESA conference presentation):

➜ New sources of income can augment otherwise stagnating agrarian incomes and make them less dependent on commodity market fluctuations. Creative ideas such as childrens' farms or letting agricultural buildings as in West Sussex are only the peak of the iceberg.

➜ Due to more frequent and intensive contacts with consumers and customers multifunctional and diversified farmers are better able to adapt to changing consumer and societal demands (active vs. passive/reluctant attitude). For instance, in Lungau, the strong integration of agriculture in rural tourism pushed the production of consumer-driven local specialities such as *Lungauer Eachtling* (local potato breed) or the liquor *Schnaps*.

➜   More interaction with the local community and collaborations with local entrepreneurs enhances social capital and strengthens the local economy. As an example, the *Demeter* farm Ökodorf Brodowin integrated in various networks in the region and the adjacent capital city of Berlin and quickly rose to a regional organic practice leader.

Finally, the positive effects in terms of increasing the regional resilience when diversifying farming activities as well as linking farming activities strongly with the overall regional economy and society have been underlined in several case studies as well as the agent based modelling results. The basic underlying idea will be that higher diversity of activity within agriculture as well as among all economic sectors within a region will allow for a more flexible reaction of regional systems (economic, environmental, social) vis-à-vis external shocks.

6.2   Different regions – different needs

The superordinate issue the TERESA empirical results highlight is clearly the importance of the diverse territory for a successful and sustainable rural development. In the case studies and TERESA agent-based modelling, detailed insights have been given into regions that seem to have similar strengths and needs from a bird's eye view, but in fact do behave very differently taking into account the regional specifics and the behaviour of local actors.

Hence, it is important to stress that there is nothing like a default development path that leads to a successful rural development. Apart from the catching-up process of lagging regions into a fully developed and diverse economy, each region has to decide which road it will take depending on the very circumstances as regards natural preconditions and social decision structures, as the agent-based modelling showed. Thus, in redesigning the hypothesised preliminary integration patterns from Figure 49 using the empirical results of the cluster analysis and the case studies, Figure 54 provides an impression of territorial diversity.

The cornerstones of the figure are the level of regional economic diversity and, depending on the natural and man-made environmental preconditions and the degree of social cohesion, the predominant pattern of integration. Regions may decide whether they direct towards a cooperational setting, stay more or less side-by side or head for more competitive elements.

A far-reaching diversification may lead to the desired results in high nature value/tourist regions but be pointless in regions suitable to intensive agriculture, such as very good quality soil regions or peri-urban regions, where a higher value production might be the right choice. One cannot even stress that a stronger competition for resources does automatically effect the level of sustainability in the regional type on the left hand side. They can perform very well overall. These special local circumstances have to be kept in mind.

In the figure, the little bolts in the graphs symbolise a potential of conflicts that has to be addressed by policy makers and regional managers of any given level, top

down or bottom up. In intensive agricultural regions, a special focus will for instance be water supply and protection from pollutants. In peri-urban agricultural regions, a main issue to address is the reasonable and sustainable planning of land use. In intensive natural value/tourist regions, landscape and other environmental protection will be essential to conserve the attractiveness of the countryside for the maintenance of the recreation function.

Figure 54   Revised types of integration of agriculture
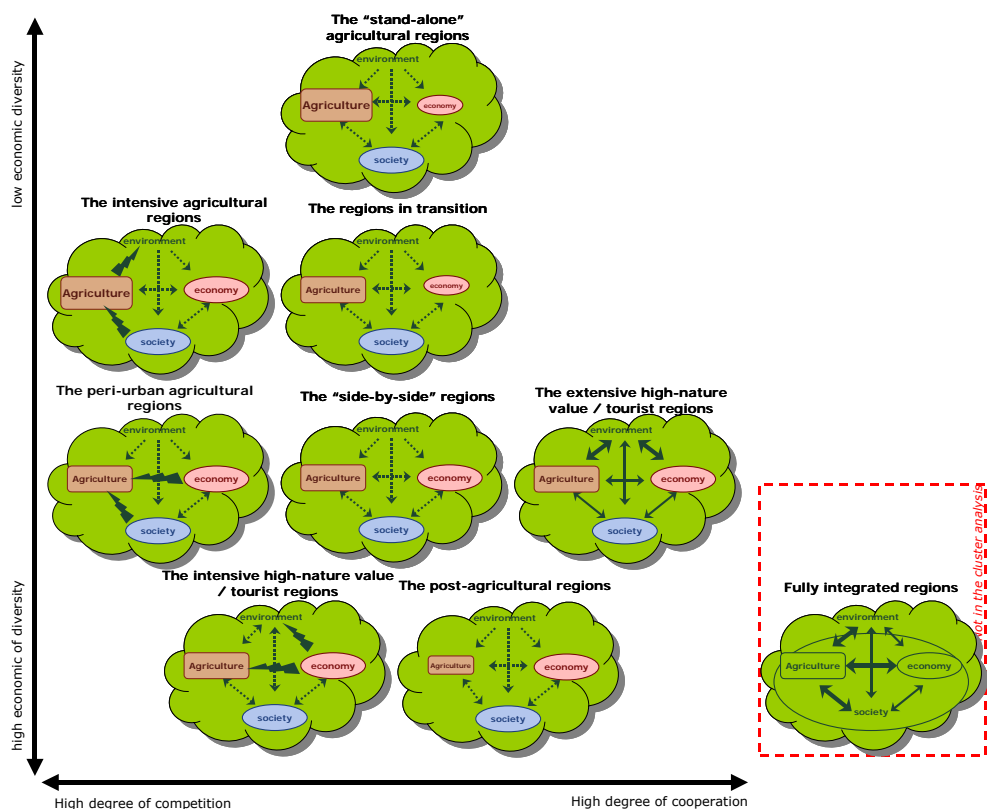
Source: ÖIR

6.3   Implications for WP 5 Policy options

As could be showed by TERESA, the integration of agriculture into the overall rural economy, society and environment is an essential element in the rural setting. The analysis conducted in TERESA provides a far more precise picture of the situations in rural areas[23], as it is conducted on a common regional scale (NUTS 2) instead of the programme level. Moreover, the amount and choice of indicators is more apt to depict strengths and integration patterns of agriculture. The TERESA cooperation patterns allow for a pluri-dimensional and focused addressing of sustainable rural development that manifests itself in three basic strategic directions.

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[23]   As for example the cluster analysis within the Synthesis of ex-ante evaluations of RD programmes (DG Agri, 2008).

Sustainable rural development based on integration patterns

First, in the sense of a meta policy recommendation, there is a clear need for *differentiating rural territories*, to take into account the rural diversity and the type of regional development in order to formulate a successful policy. As also Fischler (2008, TERESA conference presentation) pointed out, the differentiation of rural zones will increase (he named suburbs and urban surroundings, industrial and mining rural zones, touristic and recreation zones, agricultural zones). TERESA pushed this approach much further by differentiating regions according to their favoured integration pathways as well as their strengths in agricultural production. Every region has its specific attributes and therefore also its specific needs for the right policy mix. TERESA proved that the European regions in this respect can be grouped in different basic types that common policies could address.

Second, a further shift from the predominant individual level of intervention into agriculture (subsidies) towards a more *rural systemic approach* such as the investments into adding value to regional supply chains, the facilitating of other cooperative regional systems or the building up of local capacity will be required. In this respect, the strategic planning of structural funds would have to overcome the boundaries of the different funding sources to integrate all economic, social and environmental goals into rural development policy. Van der Ploeg and Roep (2003), accordingly, relate a reformed rural development to a new agri-food system with new relations between producers and consumers in which quality food chains are socially, culturally and ecologically embedded in the local territory.

Third, the aspect of *multifunctionality and the provision of public goods* will have to be included more accurately in development strategies. There are many discussions and, as a consequence, research activities going on on what kind of public goods agriculture provides and how their provision can be influenced. However, there has yet to be found a precise definition to prevent the discussion on public goods to be a temporary fashion that only fulfils the goal of a justification of the present direct payments. On the other hand, public goods, where they are clearly provided by agriculture, should be remunerated as they constitute an important foundation for the improvement of the countryside and the rural system, and might be retained as an element of income support in the policy mix in order to defend environmental assets against the extreme consequences of farm structural change (Potter and Burney 2002).

Indeed, the proactive *combination of territorial and systemic approaches* in rural development (e.g. regional supply chain networks) can be a powerful strategy to safeguard local agricultural production (and at the same time local public goods) and creating added value for the environment, the local economy and social cohesion in the sense of public goods (cf. Allaert et al. 2006). Many examples have been given in the case studies for the diverse strategies of rural development.

For instance, (food) *regions who specialise in origin labelled or other products with geographical attributes*, either peri-urban or rural, should more and more develop on the basis of local identities and added value creation in a high segment food market. The successful efforts of marketing origin-labelled cheese in Savoie or apples in Bozen-Bolzano give proof.

In *areas with a competitive agriculture*, either peri-urban or with favourable preconditions, strategies should aim at bringing the agricultural sector more in line with the constraints of urbanisation such as competition for land as the efficient use of territory saves precious fertile land for agriculture (de Roest, TERESA conference presentation 2008). These objectives can then be translated into policy incentives to push farms and agro-industry to invest in higher value chains so that agriculture (and also the non-commodity production linked to it) becomes less dependent on world commodity markets and thus less vulnerable. This may be combined with agri-environmental contracts (van Huylenbroek 2007) via a reformed cross-compliance. West Sussex with the creation of the integrated and value-adding label "Taste of Sussex" is an example for a more locally oriented measure, the more industrially-oriented and economically important horticulture supply chains Murcia may serve as an example for a global competitiveness while the solution of ecological and land use problems have yet fully to be addressed.

For *regions with a network based on links of agriculture with local industry*, the competitiveness of the agro-industrial network can be strengthened by increasing the territorial embedding. This would result in an agri-business complex which is more dependent on local resources and thus more difficult to be relocated to lower cost production regions. The importance of locally grown hop for locally brewed Perla beer in Chełmsko-zamojski or the up-and-coming regional cheese producer Synnøve in Hedmark, who had a major role in breaking the *de-facto* Norwegian cheese monopoly, are vivid demonstrations for this potential.

Areas with strong territorial advantages may further exploit these advantages by bringing in more agro-ecological elements and vertical linkages so that wider markets can be reached. This can be done by combining the territorial complex with a supply-chain complex or by strengthening the ecological embeddedness of production (e.g. switching to organic farming). The creation of the impressing organic network around the huge *Demeter* farm "Ökodorf Brodowin" in the East German region of Barnim that the TERESA team visited in 2008 proves that this can be very appropriate.

Finally, regions with important or sensitive ecological networks may learn from territorial approaches to strengthen the marketing of local products, in many cases combined with rural tourism (van Huylenbroek 2007). An example of how organic production and ecological networks can lead to economic benefits for farmers is the dairy and Schnaps production in Austrian region Lungau.

Not least, integrated strategies that pay attention to local assets also facilitate the provision of public goods and increase sustainability and resilience of rural systems.

Basic issues to be addressed

In conclusion, strategies to increase the competitiveness of rural areas and the sustainable provision of public goods alike include (cf. van Huylenbroek et al. 2007):

➔   In a *competition integration pattern*, the strengthening of local networks and promoting higher value production introduces the social sustainability

dimension into rural development. In this context, a stronger consumer orientation in agricultural production such as prepared primary products *ready-to-eat*, higher quality products or an investment in organic production may be successful. Additionally, the encouragement of sustainable use of natural resources (basically land and water) fosters ecological sustainability (which is important as most of these regions are urban and/or tourist regions).

➔ In a *competition integration pattern that is based on activities* (agri-business sector), the strengthening of competitiveness on basis of territorial resources, i.e. product rather than scale oriented, backs up social and ecological sustainability efforts alike. Here, the focus on traditional and typical products (non-exchangeable origin labelled products) or the new development of products which are in principle exchangeable on commodity markets but add value to the consumers (and the agricultural income) by a territorial identity.

➔ In a *competition integration pattern that builds on a territorial network* already, the further strengthening of the regional identity and creating vertical markets will increase economic and social sustainability. Direct marketing strategies and the integration of agricultural products into tourism development are important features in this respect.

➔ In *competition integration pattern that builds upon an ecological approach*, the creation of local food networks and non-commodity markets will also put more focus on economic and social sustainability.

Table 27 picks up Table 1 from chapter 1 again and redesigns it to take into account the TERESA pattern of integration, the TERESA clusters of rural integration paths and the strategies discussed.

Table 27   New rural development paradigms in the TERESA patterns

TERESA pattern of integration	coexistence	competition	cooperation and territory		
rural policy paradigms	dependent	competitive	multifunctional		
primary sustainability dimensions	no clear sustainability dimension (low incomes)	economic (employment)	economic (employment and services)	social	ecologic
strategies to increase sustainability	transition to other paradigms	strengthening of local networks and promoting higher value production encouragement of sustainable use of natural resources	strengthening of competitiveness on basis of territorial resources	strengthening the regional identity and creating vertical markets	creation of local food networks and noncommodity markets
predominant TERESA clusters of rural integration paths	"side-by-side" regions "stand-alone" agricultural regions regions in transition	post-agricultural regions peri-urban agricultural regions intensive high-nature value/tourist regions intensifying agricultural regions	post-agricultural regions extensive high-nature value/tourist regions intensive high-nature value/tourist regions	post-agricultural regions extensive high-nature value/tourist regions intensive high-nature value/tourist regions	post-agricultural regions extensive high-nature value/tourist regions intensive high-nature value/tourist regions

Source: Beiglböck inspired by van Huylenbroek et al. (2007)

Policy design: crucial for an integrated agriculture

If different regions can be addressed according to their real needs, the outcome will be more sustainable that today, which also Barca (2009) worshipped in the report "An Agenda for a Reformed Cohesion Policy" earlier this year, in which a place-based approach to meeting EU challenges and expectation has been already dedicated a very deep, addressing both Common Agricultural and Regional Policies.

In terms of policy design there is a clear signal towards a territorialisation of policy funds. This means that delivery mechanisms of policies should be oriented towards a bundling of policy support on to territorially homogeneous units. Ultimately this would lead to the principle of "one region one programme". Additionally, multifunctional farms and other integrated rural players are confronted with competing policy objectives and have to deal with a high administrative burden. The ex-post evaluation of structural funds programmes 2000-2006 focussing on the effects on rural areas (WP9) has listed several recommendations for the policy design in this context:

> *Coordination with other intervening policy programmes in the area: Especially for soft interventions and sectorally horizontal infrastructure a regionally bundled*

approach of all intervening programmes will be necessary. We are aware of the fact that in the ongoing programming period such an approach has been called forward (strategic framework programmes), however first experiences show that these framework programmes are still rather sector and policy filed oriented (leaving aside agriculture), than oriented upon societal needs in rural areas. The coordination should be embedded in a wide set of stakeholder participation and should fully reflect the societal needs of all citizens (including young people and women). Only then cross cutting activities (like increase of renewable energy in rural areas, bio-based chemistry, construction industry based upon local building tradition [see e.g. wood construction] etc.) may be fostered. On the other hand hard infrastructure will need far less coordination of this type. In these cases national (or even EU wide) coordination and priorisation is more needed. However the regional/local acceptance and need will always have to play a role.

Closeness to the citizen: Different types of measures call for different connectedness to the regional citizen. When the number of beneficiaries is high and located in the rural area, a delivery mechanism is called for, that ensures that transaction costs for the programme applicant is as low as possible and rather decentralised delivery mechanisms will be needed. Therefore it will add to the effectiveness of ERDF support if such a differentiation will be established to bring EU funding closer to citizens, where needed.

Administrational procedures: the smaller the single support, the more a trade off between the benefits achieved and the administrational burden to attain the funding will play a role. More and more project applicants (especially in rural areas) do not apply for funding due to this cost-benefit ratio. It will therefore necessary to use this classification of areas of intervention to differentiate in terms of administrational procedures.

Regional and rural policy has of course already begun a paradigm shift from top-down, subsidy-based approaches into a broader integrated approach designed to improve local competitiveness, that takes into account the valorisation of local assets and knowledge in a multi-sectoral approach and is built on the investment in local structures rather than individual subsidies (OECD 2006). With the TERESA approach that assesses the integration capacity and potential of all rural sectors and players, a new empirical basis has been created that can serve as a starting point for a regionally and systemically differentiated rural policy in Europe.

6.4   Recommendations for future research

In this sections, the major information gaps and weaknesses detected in the present study are turned into a short series of research recommendations for future activities.

1. **Develop indicators to analyse the integration of agriculture in further depth**

So far such indicators are rare. As the TERESA cluster analysis showed, there are very few indicators by which the integration of agriculture into rural development can be measured. Economic indicators would be: regional economic sectoral indicators that go at least down to NACE subsections (e.g. C 10 Manufacture of food products) or even better divisions (e.g. C 10.1 Processing and preserving of meat and production of meat products) and regional input-output tables. For the measuring of social integration – in which the data situation is very poor – is the development of integrated indicators linking socio-economic requirements with

territorial potentials may be a solution (Wiggering et al. 2006). For the measurement of social integration and sustainable development it is generally recommended by the project team to put a stronger emphasis on data on households and consumption (cf. Stiglitz et al. 2009). A selective but useful tool to measure the economic impact of integrated (deepened) agriculture would be an aggregated regional database of registered agricultural quality products. The present DOOR – Database does not provide aggregate data. A detailed analysis of this data could not be managed in the scope of the TERESA project due to time constraints.

2. **Collect more empirical data on supply chains**

As TERESA showed, supply chains of agricultural products can be a very strong driving force in overall rural development. The TERESA data collection for supply chain analysis in the case study regions was a very enlightening task. However, 30-40 supply chains cannot be considered representative for European rural development. Aside, the data collection in TERESA was very much designed for agent-based modelling, which was why secondary empirical analyses had limited validity without including much qualitative information. Nonetheless, the methodologies and typologies developed in this project could build a foundation for future research that in a representative way captures the entirety of agricultural supply chains in Europe.

3. **Develop a clear definition of the provision of public goods by agriculture**

In the case that the provision of public goods by agriculture will be a central tool for keeping direct payments alive in a future CAP, justified by agriculture providing valuable services for integrated rural development, it will be essential to have clear and measurable definition of the multifunctional model. Research is on the way in this field and is further recommended.

4. **Carry out research on real farmers' behaviour with respect to the integration of agriculture**

The TERESA agent-based model used only idealized behaviours and decision rules. Because of the farm and location specific elements of multifunctionality, the individual farm reaction to changes in a specific type of region becomes important to explore the regional impact of generic and maybe regionally adapted instruments.

5. **Create a comparable European database for the use of CAP subsidies**

Any research on regional policy impacts relies on policy information. Consequently, it would be more than desirable to have information on a regional aggregate of policy interventions. In some of the case study regions, it was even impossible to get reliable data on pillar 1 payments at all. In pillar 2, many countries only provide aggregate data on the national programming level. After the first Member States' websites on beneficiaries of CAP payments under Article 44a of Council Regulation (EC) No 1290/2005 as amended by Council Regulation (EC) No 1437/2007 and Commission Regulation (EC) No 259/2008 went online in 2008, the TERESA team

started collecting data on the recipients. But due to the complicated technical nature of the databases provided, it would have been impossible to survey all national databases in the frame of the TERESA project. An analysis done using the data for Austria by ÖIR recently measured the CAP payments on pillar and axis level in the Austrian municipalities based on the *Transparenzdatenbank* information (Map 5). A common European database, e.g. on NUTS level 3, with a comparable breakdown would be essential for studying any rural development policy impact.

Map 5   Austrian CAP subsidies: average direct payments per recipient and municipality, 2008
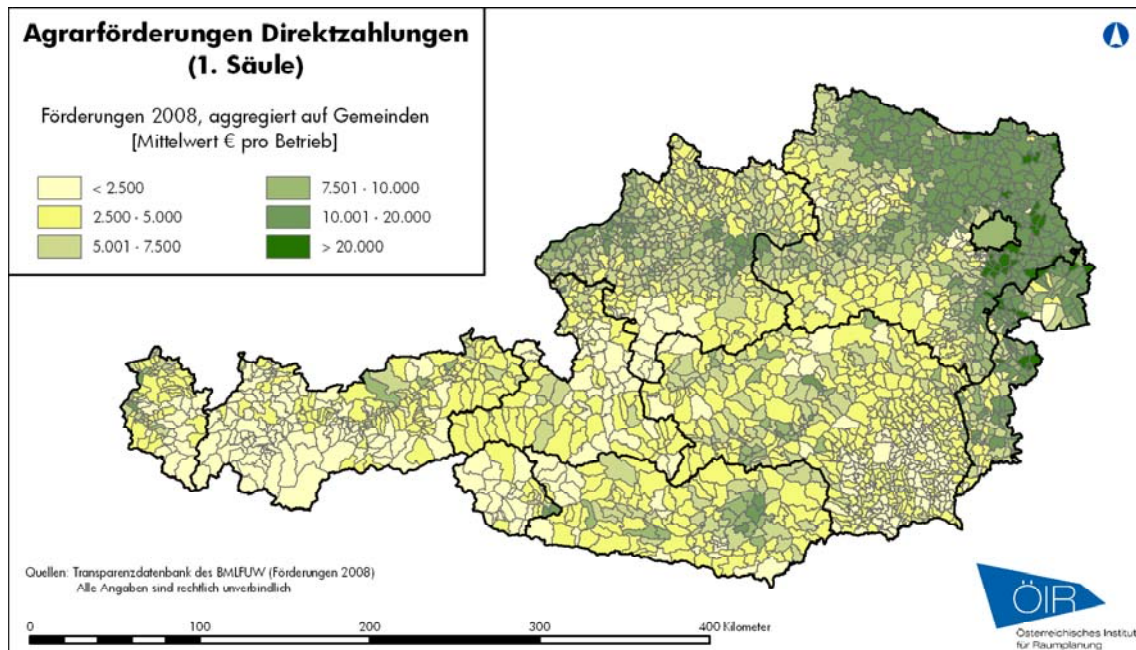
Source: ÖIR based on transparenzdatenbank.at (data extraction by farmsubsidy.org), unpublished; publishing date in RAUM 76 (Austrian magazine for spatial planning and regional policy): December 2009

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ANNEX 1: CLUSTERING

The methodological approach of clustering

In a first analytical step the correlation between indicators were calculated in order to avoid overlaps in the capacity to depict qualities of the programming areas or biases through the inherent weighting of specific aspects of the overall balanced picture. Annex 3 of the revised version of the 1st IR of synthesis of ex-ante evaluations of RD programmes shows these correlation matrixes calculated by Pearson and Spearman-Rho. Both correlation matrixes show no significant correlation between single indicators. This means that no indicator is "overlapping" with another indicator or depending on another one – thus putting a misleading emphasis on one single aspect of the analysis of programming areas.

In terms of methodology[24] the following approach has been used:

By means of cluster analysis, the regions were classified in several clusters which on the one hand should be in itself as similar as possible (homogeneous) and which on the other hand should be as different as possible (heterogeneous) among each other.

Clustering is the classification of objects into different groups, or more precisely, the partitioning of a data set into subsets (clusters), so that the data in each subset (ideally) share some common trait – often proximity according to some defined distance measure.

The data clustering was executed by means of two different processes (see Figure 55 below). Due to the fact that firstly no groups (clusters) were known, a hierarchical algorithm had to be chosen.

The (hierarchical) clustering could finally be improved by a partitional algorithm (k-means clustering).

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[24]   see Hans-Friedrich Eckey, Multivariate Statistik; unpublished script

Figure 55   Clustering process by combining (hierarchical) clustering and partitional
                    algorithm
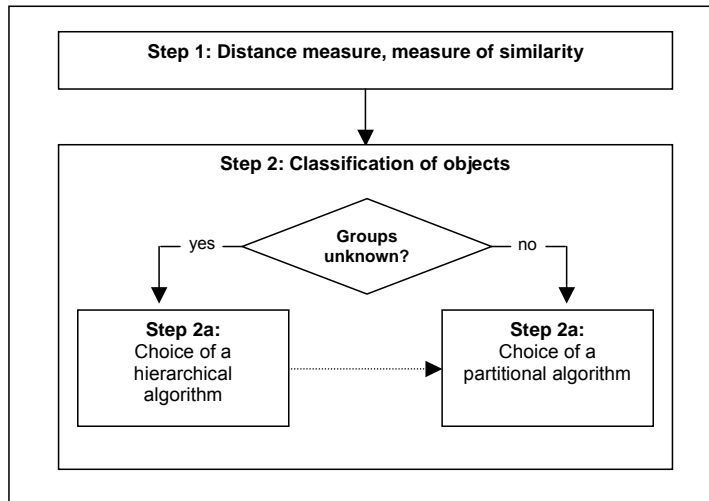
Hierarchical algorithms find successive clusters using previously established clusters, whereas partitional algorithms determine all clusters at once.

The hierarchical algorithm calculates as follows (see also figure 2 below):

First each element builds a separate cluster (finest partition – no object belongs to more than one cluster).

The two clusters which are closest (according to the chosen distance) resp. which merging causes the lowest increase in intra-class variance get merged.

The distance matrix gets modified resp. the intra-class variances get re-calculated.

The algorithm can be (theoretically) continued until just one cluster remains.

Clustering gets stopped either when the clusters are too far apart to be merged (distance criterion) or when there is a sufficiently small number of clusters (number criterion).

Figure 56   Hierarchical algorithm process of calculation
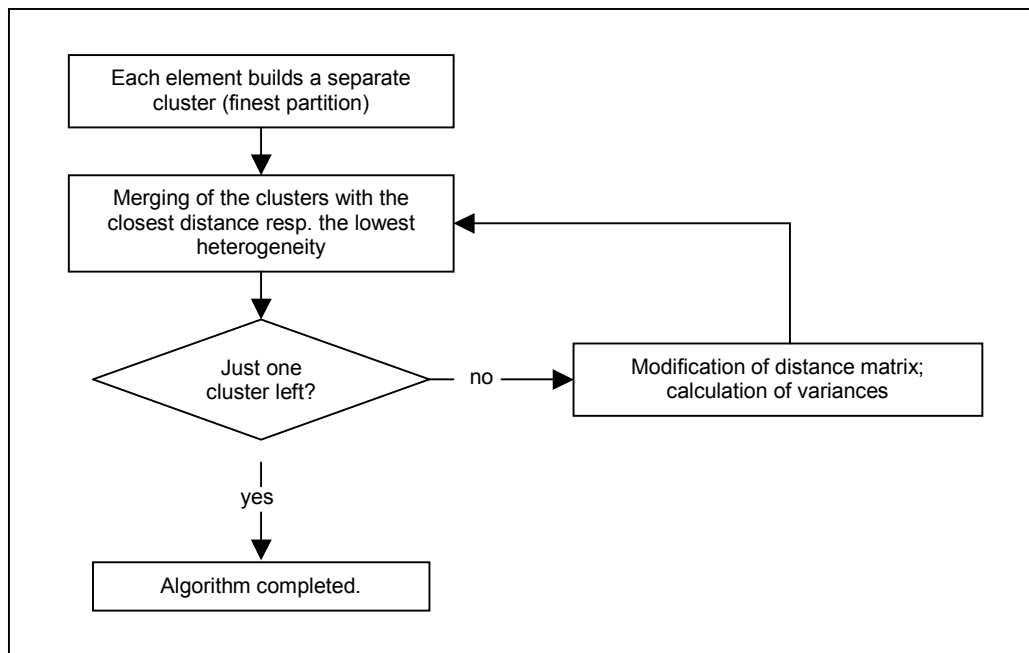
Due to the fact that firstly no groups (clusters) were known, the hierarchical algorithm was chosen. To get groups in clusters which are as homogeneous as possible, the Ward method was used. The aim of the Ward method is to unify groups in such way that the variation inside these groups does not increase too drastically.

When variance-oriented algorithms are used, the squared Euclidean distance must be used as distance function. Thereby the Euclidean distance – the "ordinary" distance between two points in the two-dimensional space – gets squared.

When Ward linkage method is used for clustering, all variables have to be measured on a metric scale. All used variables meet this condition.

$$QED(i, j) = \sum_{k=1}^{m} \left(z_{ik} - z_{jk} \right)^2$$

Ward's Method

Ward's method is one possible approach for performing cluster analysis. Basically, it looks at cluster analysis as an analysis of variance problem, instead of using distance metrics or measures of association.

To calculate the mean of the gth cluster for the kth Variable all n_g objects of this cluster are used:

$$\bar{z}_{gk} = \frac{1}{n_g} \sum_{i \in C_g}^{n_g} z_{ik}$$

So the sum of the square deviations of the single values of this variable in cluster g can be calculated:

$$\sum_{i \in C_g}^{n_g} \left(z_{ik} - \bar{z}_{gk} \right)^2$$

The adding over all m variables shows the variation within cluster g:

$$V_g = \sum_{k=1 i \in C_g}^{m} \sum^{n_g} \left(z_{ik} - \bar{z}_{gk} \right)^2$$

The adding of the V_gs over all clusters shows the error sum of squares of a special partition:

By every fusion the variance within the clusters increases.

The clusters should be as homogeneous as possible, that means the variance within the clusters should be as small as possible. Using Ward's method two clusters get merged if the fusion causes the smallest increase of the variance within the clusters and for this reason causes a growth of heterogeneity within the clusters which is as small as possible.

The increase of the term V in case of merging the clusters C_g and C_h can be determined by the expression:

$$\Delta V \left(C_g \cup C_h \right) = \frac{n_g \cdot n_h}{n_g + n_h} \sum_{k=1}^{m} \left(\bar{z}_{gk} - \bar{z}_{hk} \right)^2$$

Within the classification process the growth ΔV has to be calculated for all pairs of clusters. The two clusters with the smallest value of ΔV get merged.

To optimize the cluster solution calculated with the hierarchical algorithm, finally a partitional algorithm was used. Thereby an initial partition based on the results of the hierarchical algorithm was employed. These indicators have to be analysed to enable a comparison between all European regions. As it is not the aim of this analysis to get absolute values for certain regions but rather different patterns emerging, a method is proposed that allows to combine very heterogeneous kinds of information.

In a complex and strongly interrelated world such a reduction seems to be rather dangerous. This implies that evaluating such multi-related sets of indicators will always be characterised by the search for acceptable compromise solutions. Problems of the above-mentioned type are characterised by the following properties:

➔ A high degree of incomparability of the parameters (a mix of quantitative and qualitative indicators, different time scales)
➔ Certain parameters could only be included in the evaluation by using rather vague replacement indicators or proxies (e.g. in the context of measuring social qualities)

Mean indicators inside the 8 clusters

Mean indicators inside the clusters

Means	-	-	-	X	X	X	X	-	-	-	-	X	X	-	X	X
C8_r_Ward	Population (in 1000)	Population density	Area (km²)	GDP in pps per capita	change of GDP in pps per capita	share of GVA in primary sector	share of GVA in secondary sector	share of GVA in tertiary sector	share of employment in Primary sector	share of employment in Secondary sector	share of employment in Tertiary sector	change of employment in Primary sector	change of employment in Secondary sector	change of employment in Tertiary sector	net migration crude rate (per 1000)	25 to 64 year old participating in education and training
1	1.697	923,26	7219	113,70	1,6	1,3	24,5	74,2	1,8	22,3	75,7	-0,4	0,0	-0,4	4,07	18,9
2	2.137	851,35	3513	124,33	1,5	1,4	24,1	74,4	2,3	21,4	76,3	0,1	-1,2	3,6	3,28	10,7
3	1.954	178,56	14522	98,06	-3,6	2,1	28,4	69,6	3,6	26,3	70,1	-0,5	-2,5	2,9	1,02	7,3
4	2.193	86,11	24915	34,31	4,9	10,8	32,0	57,2	28,6	27,8	43,6	-8,4	1,9	6,5	-0,74	1,9
5	1.927	100,06	24513	64,66	4,4	5,2	34,6	60,2	9,8	32,7	57,5	-3,3	0,0	3,3	3,66	5,7
6	1.133	58,87	40059	104,33	-0,8	2,7	32,3	65,0	5,6	27,6	66,8	-0,8	-2,0	2,8	2,77	16,8
7	1.967	161,18	13019	93,31	-6,4	4,0	24,7	71,3	8,7	24,2	67,1	-2,2	-0,2	2,3	5,99	5,4
8	2.526	386,66	17219	80,96	4,0	3,5	29,6	66,9	8,6	30,5	60,9	-1,6	-1,4	3,0	8,63	6,9
	1.903	354,57	16319	93,05	-0,1	3,4	28,3	68,3	7,0	26,1	66,8	-1,8	-0,7	2,7	3,32	9,3
Maximum	2.526	923,26	40059	124,33	4,9	10,8	34,6	74,4	28,6	32,7	76,3	0,1	1,9	6,5	8,63	18,9
Minimum	1.133	58,87	3513	34,31	-6,4	1,3	24,1	57,2	1,8	21,4	43,6	-8,4	-2,5	-0,4	-0,74	1,9

Means	-	-	-	X	X	X	-	-	X	X	X	-	-	X	X	-
C8_r_Ward	share of predominantely rural areas	share of intermediate areas	share of predominantely urban areas	share of population in predominantely rural areas	share of population in intermediate areas	share of population in predominantely urban areas	absolute GVA in primary sector	number of farms	share of managers with agricultural training	share of UAA under organic farming	share of holders with other gainful activity	importance of secondary farm activities	importance of secondary farm activities (per farm)	importance of secondary farm activities (per GVA agri)	importance of Leader action groups	importance of industrial crops
1	8,1	43,0	48,9	3,5	34,6	61,9	398,48	8286	27,9	0,0	42,5	547,97	56,75	1,01	1,21	368,11
2	0,6	28,5	70,9	0,9	22,1	77,0	490,52	7988	58,3	0,0	24,4	14,79	2,12	0,03	1,62	70,52
3	38,0	47,2	14,7	24,7	46,9	28,4	829,45	16137	63,5	0,0	40,1	98,93	8,83	0,12	5,08	554,90
4	49,9	43,7	6,4	37,7	49,8	12,5	689,61	321685	15,1	0,0	37,5	89,65	0,37	0,15	2,00	80,59
5	45,4	47,0	7,6	35,9	49,2	14,9	859,43	85517	26,1	0,0	37,2	212,75	3,75	0,16	9,18	74,18
6	79,1	18,1	2,8	70,0	25,0	5,0	602,09	19415	38,5	0,1	51,5	108,58	8,04	0,25	4,57	54,57
7	42,3	44,5	13,3	34,0	45,3	20,6	969,82	64255	14,1	0,0	27,3	98,77	4,56	0,18	5,29	55,51
8	28,7	41,6	29,6	19,4	31,7	48,9	925,86	72224	9,1	0,0	31,5	116,05	2,88	0,12	6,38	13,20
	34,4	40,8	24,8	26,2	39,8	34,0	722,57	56105	35,8	0,0	36,3	176,55	12,82	0,27	4,58	207,57
Maximum	79,1	47,2	70,9	70,0	49,8	77,0	969,82	321685	63,5	0,1	51,5	547,97	56,75	1,01	9,18	554,90
Minimum	0,6	18,1	2,8	0,9	22,1	5,0	398,48	7988	9,1	0,0	24,4	14,79	0,37	0,03	1,21	13,20

Mean indicators inside the clusters (continued)

Means	X	-	X	-	-	X	-	X	-	-	-	-	-	-	X	X
C8_r_Ward	importance of industrial crops (per GVA agri)	employment in food industry	share of employ- ment in food industry	total employment (in 1000)	employment in leather industry	share of employment in leather industry	employment in wood industry	share of employment in wood industry	total number of bed places	change of total number of bed places	bed places per inhabitant	change of total number of bed places in %	nights spent in total	nights spent in accomodations other than hotels	nights spent per inhabitant	nights spent per inhabitant (non hotel)
1	0,90	12,05	1,7	797,6	0,03	0,0	2,54	0,3	87398	39230	0,06	85,1	4788082	715292	2,86	0,40
2	0,14	16,79	2,0	980,1	0,07	0,0	1,85	0,2	80743	1977	0,06	-1,2	6238682	572349	2,42	0,38
3	0,85	25,30	2,9	877,4	0,03	0,0	2,89	0,4	126716	17682	0,07	14,4	4944646	2276145	2,53	1,13
4	0,14	29,44	3,5	950,0	0,22	0,0	6,74	0,8	34925	6678	0,02	22,1	2378195	221581	1,35	0,12
5	0,12	26,30	3,3	829,0	0,15	0,0	8,22	1,1	71418	5987	0,04	8,9	4646749	940721	2,24	0,54
6	0,09	11,43	1,8	551,7	0,05	0,0	5,72	1,2	86502	5127	0,10	4,9	3508138	502844	4,28	0,52
7	0,05	15,38	2,2	795,7	0,52	0,0	4,98	0,7	195525	24960	0,16	14,7	12585922	1332412	12,29	1,09
8	0,02	28,12	2,5	1209,4	0,93	0,1	10,00	0,8	85142	4652	0,03	16,0	6554476	252881	2,27	0,12
	0,37	19,94	2,5	845,6	0,18	0,0	4,68	0,6	105578	15857	0,07	21,9	6051657	1082035	4,17	0,66
Maximum	0,90	29,44	3,5	1209,4	0,93	0,1	10,00	1,2	195525	39230	0,16	85,1	12585922	2276145	12,29	1,13
Minimum	0,02	11,43	1,7	551,7	0,03	0,0	1,85	0,2	34925	1977	0,02	-1,2	2378195	221581	1,35	0,12

Means	X	X	-	X	-	X	-	X	-	X	X
C8_r_Ward	share of UAA for extensive arable crops	share of UAA for extensive arable grazing	urban areas at the expense of agricultural areas	urban areas at the expense of agricultural areas (per km²)	economic areas at the expense of agricultural areas	economic areas at the expense of agricultural areas (per km²)	agricultural areas at the expense of other areas	agricultural areas at the expense of other areas (per km²)	forest areas at the expense of other areas	forest areas at the expense of other areas (per km²)	water use
1	0,00	13,81	339,21	0,08	735,90	0,15	154,13	0,02	5253,67	0,42	1,75
2	0,75	7,21	2131,41	0,66	2941,53	0,86	279,35	0,06	2289,41	0,51	3,86
3	0,00	5,63	2456,80	0,20	2752,57	0,23	600,16	0,03	13576,78	0,71	3,63
4	49,85	16,10	260,18	0,01	585,65	0,02	965,06	0,04	11119,59	0,49	1,58
5	2,78	30,79	1207,56	0,04	2326,69	0,10	3483,29	0,10	36337,20	1,58	3,10
6	4,14	47,00	357,19	0,02	808,24	0,04	90,14	0,01	2397,57	0,11	1,39
7	10,79	28,32	1747,05	0,14	1783,74	0,14	599,71	0,05	7737,14	0,61	20,17
8	20,75	30,77	6007,25	0,32	6019,88	0,54	16992,63	0,92	82120,13	6,25	18,77
	6,63	20,05	1551,33	0,18	2038,13	0,24	1487,52	0,07	14909,05	0,89	6,14
Maximum	49,85	47,00	6007,25	0,66	6019,88	0,86	16992,63	0,92	82120,13	6,25	20,17
Minimum	0,00	5,63	260,18	0,01	585,65	0,02	90,14	0,01	2289,41	0,11	1,39

Lists of NUTS 2 regions per cluster

Cluster 1: The post-agricultural regions

- BE10 Région de Bruxelles-Capitale/Brussels Hoofdstedelijk Gewest
- FR21 Champagne-Ardenne
- FR53 Poitou-Charentes
- FI18 Etelä-Suomi
- SE11 Stockholm
- UKC1 Tees Valley and Durham
- UKC2 Northumberland and Tyne and Wear
- UKD1 Cumbria
- UKD2 Cheshire
- UKD3 Greater Manchester
- UKD4 Lancashire
- UKD5 Merseyside
- UKE1 East Yorkshire and Northern Lincolnshire
- UKE2 North Yorkshire
- UKE3 South Yorkshire
- UKE4 West Yorkshire
- UKF1 Derbyshire and Nottinghamshire
- UKF2 Leicestershire, Rutland and Northamptonshire
- UKF3 Lincolnshire
- UKG1 Herefordshire, Worcestershire and Warwickshire
- UKG2 Shropshire and Staffordshire
- UKG3 West Midlands
- UKH1 East Anglia
- UKH2 Bedfordshire and Hertfordshire
- UKH3 Essex
- UKI1 Inner London
- UKI2 Outer London
- UKJ1 Berkshire, Buckinghamshire and Oxfordshire
- UKJ2 Surrey, East and West Sussex
- UKJ3 Hampshire and Isle of Wight
- UKJ4 Kent
- UKK1 Gloucestershire, Wiltshire and Bristol/Bath area
- UKK2 Dorset and Somerset
- UKK3 Cornwall and Isles of Scilly
- UKK4 Devon
- UKL1 West Wales and The Valleys
- UKL2 East Wales
- UKM2 Eastern Scotland
- UKM3 South Western Scotland

Cluster 2: The peri-urban agricultural regions

- BE21 Prov. Antwerpen
- BE22 Prov. Limburg (B)
- BE23 Prov. Oost-Vlaanderen
- BE24 Prov. Vlaams-Brabant
- BE25 Prov. West-Vlaanderen
- BE31 Prov. Brabant Wallon
- BE32 Prov. Hainaut
- BE33 Prov. Liège
- CZ01 Praha
- DE30 Berlin
- DE50 Bremen
- DE60 Hamburg
- DEA1 Düsseldorf
- DEA2 Köln
- GR30 Attiki
- ES30 Comunidad de Madrid
- FR10 Île de France
- FR30 Nord – Pas-de-Calais
- LU00 Luxembourg (Grand-Duché)
- HU10 Kozep-Magyarorszag
- NL11 Groningen
- NL12 Friesland (NL)
- NL13 Drenthe
- NL21 Overijssel
- NL22 Gelderland
- NL23 Flevoland
- NL31 Utrecht
- NL32 Noord-Holland
- NL33 Zuid-Holland
- NL34 Zeeland
- NL41 Noord-Brabant
- NL42 Limburg (NL)
- AT13 Wien
- SK01 Bratislavsky kraj

Cluster 3: The "side-by-side" regions

- BE34 Prov. Luxembourg (B)
- BE35 Prov. Namur
- DE11 Stuttgart
- DE12 Karlsruhe
- DE13 Freiburg
- DE14 Tübingen
- DE21 Oberbayern
- DE22 Niederbayern
- DE23 Oberpfalz
- DE24 Oberfranken
- DE25 Mittelfranken
- DE26 Unterfranken
- DE27 Schwaben
- DE41 Brandenburg – Nordost
- DE42 Brandenburg – Südwest
- DE71 Darmstadt
- DE72 Gießen
- DE73 Kassel
- DE80 Mecklenburg-Vorpommern
- DE91 Braunschweig
- DE92 Hannover
- DE93 Lüneburg
- DE94 Weser-Ems
- DEA3 Münster
- DEA4 Detmold
- DEA5 Arnsberg
- DEB1 Koblenz
- DEB2 Trier
- DEB3 Rheinhessen-Pfalz
- DEC0 Saarland
- DED1 Chemnitz
- DED2 Dresden
- DED3 Leipzig
- DEE0 Sachsen-Anhalt
- DEF0 Schleswig-Holstein
- DEG0 Thüringen
- FR22 Picardie
- FR23 Haute-Normandie
- FR24 Centre
- FR25 Basse-Normandie
- FR26 Bourgogne
- FR41 Lorraine
- FR42 Alsace
- FR51 Pays de la Loire
- FR52 Bretagne
- FR61 Aquitaine
- FR62 Midi-Pyrénées
- FR63 Limousin
- FR72 Auvergne
- FR81 Languedoc-Roussillon
- PL42 Zachodniopomorskie

Cluster 4: The "stand-alone" agricultural regions

- BG31   Severozapaden
- BG32   Severen tsentralen
- BG33   Severoiztochen
- BG34   Yugoiztochen
- BG41   Yugozapaden
- BG42   Yuzhen tsentralen
- PL11   Lodzkie
- PL12   Mazowieckie
- PL33   Swietokrzyskie
- PL34   Podlaskie
- RO11   Nord-Vest
- RO12   Centru
- RO21   Nord-Est
- RO22   Sud-Est
- RO31   Sud – Muntenia
- RO41   Sud-Vest Oltenia
- RO42   Vest

Cluster 5: The regions in transition

- CZ02   Stredni Cechy
- CZ03   Jihozapad
- CZ04   Severozapad
- CZ05   Severovychod
- CZ06   Jihovychod
- CZ07   Stredni Morava
- CZ08   Moravskoslezsko
- EE00   Eesti
- IE01   Border, Midland and Western
- IE02   Southern and Eastern
- GR41   Voreio Aigaio
- ES11   Galicia
- ES12   Principado de Asturias
- ES13   Cantabria
- ES22   Comunidad Foral de Navarra
- ES23   La Rioja
- ES24   Aragón
- ES41   Castilla y León
- ES42   Castilla-La Mancha
- ES51   Cataluña
- ES61   Andalucía
- LV00   Latvija
- LT00   Lietuva
- HU21   Kozep-Dunantul
- HU22   Nyugat-Dunantul
- HU23   Del-Dunantul
- HU31   Eszak-Magyarorszag
- HU32   Eszak-Alfold
- HU33   Dél-Alföld
- PL21   Malopolskie
- PL22   Slaskie
- PL31   Lubelskie
- PL32   Podkarpackie
- PL41   Wielkopolskie
- PL43   Lubuskie
- PL51   Dolnoslaskie
- PL52   Opolskie
- PL61   Kujawsko-Pomorskie
- PL62   Warminsko-Mazurskie
- PL63   Pomorskie
- PT18   Alentejo
- SK02   Zapadne Slovensko
- SK03   Stredne Slovensko
- SK04   Vychodne Slovensko
- UKN0   Northern Ireland

Cluster 6: The extensive high-nature value/tourist regions

- DK   Danmark
- FR43   Franche-Comté
- AT11   Burgenland (A)
- AT12   Niederösterreich
- AT21   Kärnten
- AT22   Steiermark
- AT31   Oberösterreich
- AT34   Vorarlberg
- SI01   Vzhodna Slovenija
- SI02   Zahodna Slovenija
- FI13   Itä-Suomi
- FI19   Länsi-Suomi
- FI1A   Pohjois-Suomi
- FI20   Åland
- SE12   Östra Mellansverige
- SE21   Småland med öarna
- SE22   Sydsverige
- SE23   Västsverige
- SE31   Norra Mellansverige
- SE32   Mellersta Norrland
- SE33   Övre Norrland

Cluster 7: The intensive high-nature value/tourist regions

- GR11   Anatoliki Makedonia, Thraki
- GR12   Kentriki Makedonia
- GR13   Dytiki Makedonia
- GR14   Thessalia
- GR21   Ipeiros
- GR22   Ionia Nisia
- GR23   Dytiki Ellada
- GR24   Sterea Ellada
- GR25   Peloponnisos
- GR42   Notio Aigaio
- GR43   Kriti
- ES53   Illes Balears
- ES70   Canarias
- FR71   Rhône-Alpes
- FR82   Provence-Alpes-Côte d'Azur
- FR83   Corse
- ITC1   Piemonte
- ITC2   Valle d'Aosta/Vallée d'Aoste
- ITC3   Liguria
- ITC4   Lombardia
- ITD1   Provincia Autonoma Bolzano/Bozen
- ITD2   Provincia Autonoma Trento
- ITD3   Veneto
- ITD4   Friuli-Venezia Giulia
- ITD5   Emilia-Romagna
- ITE1   Toscana
- ITE2   Umbria
- ITE3   Marche
- ITE4   Lazio
- ITF1   Abruzzo
- ITF2   Molise
- ITF3   Campania
- ITF4   Puglia
- ITF5   Basilicata
- ITF6   Calabria
- ITG1   Sicilia
- ITG2   Sardegna
- CY00   Kypros/Kibris
- MT00   Malta
- AT32   Salzburg
- AT33   Tirol
- PT15   Algarve

Cluster 8: The intensifying agricultural regions

- ES21   País Vasco
- ES43   Extremadura
- ES52   Comunidad Valenciana
- ES62   Región de Murcia
- PT11   Norte
- PT16   Centro (P)
- PT17   Lisboa
- RO32   Bucuresti – Ilfov

ANNEX 2: ANALYSIS OF SUPPLY CHAIN INTEGRATION

Table of results: the example of the Beaufort cheese supply chain

Region

Country	Name	Type of dvlp	Agriculture: % of employment	Integration patterns of agriculture
France	Savoie	developed rural tourist	2	competition-cooperation

Supply chain

Name	Regional importance: n farmers/ total farmers	Product characteristics: standard/unique product	Production system: conventional/organic production	Marketing system: Indirect/direct marketing	Components of supply chain	Geographical extension: parts inside and outside the area
BEAUFORT	0.18 625/3400	unique	conventional	indirect with around 30% of direct marketing by the cooperatives	farms: production	inside the area
					cooperatives: milk collection and transformation	inside the area
					wholesalers: marketing and distribution	local and national firms
					consumers	inside (mainly) and outside the area

Past changes	Future prospects
minor increase	no change
minor increase	minor increase
minor increase	minor increase
minor increase in the demand	no change in the demand

Resources mobilised

Stage of the supply chain	Type of the ressources mobilised and description	Generic (G) or Specific (S)	Relative importance of the ressource mobilised
Production	natural : alpine pastures, meadows, local breeds	S	1
	economic : capital	G	4
	technological : basic ? agricultural practices	S	3
	human : farmers	S	2
Processing	natural : water	G	4
	economic: capital	G	3
	technological: local know-how to elaborate cheese, specific research and innovation	S	1
	human: cheese makers know-how	S	2
Distribution	natural: wood (pallet)	G	4
	economic: capital	G	1
	technological	G	3
	human	G	2

Networks: relationships between agriculture (supply chain) and other actors

Sector	Type of actors	Type of interrelation: cooperative, controversial	Type of relationship: market, hierarchical, public support, partnership, trust, conflict	Strength of the relation	Intensity of insertion of agriculture in networks
Economic sector	Farmers (producers) and cooperatives (processors and retailers) with tourism NGO's	cooperative	trust	light	medium and informal (established relationships and concrete projects between agriculture and tourism remain quite weak but this is an emerging issue)
Environment	Farmers with environmental NGO's Farmers with National Park	cooperative cooperative controversial	partnership public support, partnership conflict	light light light	medium, in the form of projects and contracts
Local and regional government	Farmers with communes Farmers with departments Producers (farmers), processors and retailers (cooperatives) with regional government	controversial for land use cooperative for landscape management & direct marketing cooperative cooperative	conflict public support, partnership public support public support	light light strong strong	high: rural development is supported by the regional government
Other	Union of Producers with research organisms	cooperative	partnership	strong	

Outcomes (positive and negative externalities)

Type of outcomes	Importance of the outcomes (high/low)
Employment	low : around 2% (1000 workers)
Income	low
Environment	mainly positive, high importance, but decreasing: landscape and biodiversity management, some problems with manure management
Social	positive and high: local culture and identity

Sustainability = performance of the supply chain - good performance

Stage of the supply chain	Economic	Social	Environmental
Production : milk producers	7-7	7-7	6-7
Processing : cooperatives	7-7	7-7	6-7
Distribution : wholesalers	NA	NA	NA

Synthetic table of results for the 31 supply chains analysed

(see also next pages)

Supply chain	Typology	REGION					RESSOURCES						
		Country	Name	Autonomy of the region	Integration pattern	Type of developmnt	G/S	Global score	Label quality/geo graphical	what kind of technology	Natural	Human	Energy
Beaufort cheese (FR)	A1	FR	Savoie	intermediate -	competition-cooperation	developed economy, rural, tourist	SNTH	4	Yes (AOP)	high tech/ know-how	high	high	medium
Schnapps (AT)	A1	AT	Lungau	low	coexistence	developed economy, rural, tourist	SH	1	No	basic/ up-to-date/ know-how	**medium**	high	medium
Speck (IT)	A1	IT	Bozen-Bolzano	high	competition	developed economy, rural, tourist	SH	2	Yes (GGA)	up-to-date?/ know-how	**LOW**	**LOW**	medium
Wine (IT)	A1	IT	Bozen-Bolzano	high	competition	developed economy, rural, tourist	SNH	3	Yes (DOC)	up-to-date/ know-how	high	high	low
Apples (IT)	A2	IT	Bozen-Bolzano	high	competition	developed economy, rural, tourist	SNH	2	Yes (integrated production)	high tech?/ know-how	high	high	low
Hop (PL)	A2	PL	Chelmsko-zamojski	intermediate -	coexistence	transition economy, rural	SHT	2	No	basic/ up-to-date/ know-how	medium	**LOW**	medium
Synnove cheese (NO)	A2	NO	Hedmark	? strong centralisation in later years	coexistence	developed economy, rural	SH	1	No	up-to-date / know-how	medium	high	medium
Brodowin milk (DE)	A3	DE	Barnim	intermediate +	cooperation	developed economy, urban	SH	1	Yes (Demeter)	up-to-date/ know-how	high	high	medium
Goat cheese (FR)	A3	FR	Savoie	intermediate -	competition-cooperation	developed economy, rural, tourist	SH	2	Partly (AOP)	basic/ know-how	high	high	low
Wood (DE)	A3	DE	Barnim	intermediate +	cooperation	developed economy, urban	G	-2	Yes (PEFC)	up-to-date	medium	high	medium
Cereals (RO)	B1	RO	Timi	low	coexistence	transition economy, rural	G	-3	No	basic	high	high	high
Milk (PL)	B1	PL	Chelmsko-zamojski	intermediate -	coexistence	transition economy, rural	G	-3	No	basic	high	high	low
Beef (IE)	B2	IE	South West	low	competition	developed economy, urban	G	-1	No	basic?	high	n.a.	medium
Butter (IE)	B2	IE	South West	low	competition	developed economy, urban	G	-1	No	up-to-date	high	high	high
Lettuce (UK)	B2	UK	West Sussex	low	competition	developed economy, urban	G	-2	Yes (integrated production)	high tech	high	high	high
Milk (FR)	B2	FR	Savoie	intermediate -	competition-cooperation	developed economy, rural, tourist	G	-1	Partly (GIP)	up-to-date	high	high	medium
Milk (UK)	B2	UK	West Sussex	low	competition	developed economy, urban	G	-1	Yes (Taste of Sussex)	up-to-date	high	high	high
Maize (HU)	B3	HU	Bacs-Kiskun	intermediate +	coexistence	transition economy, rural	G	-3	No	up-to-date	high	**LOW**	high
Milk (AT)	B3	AT	Lungau	low	coexistence	developed economy, rural, tourist	SN	1	No	up-to-date?	high	high	low
Milk (RO)	B3	RO	Timi	low	coexistence	transition economy, rural	G	-3	No	basic/ up-to-date	high	**LOW**	low
Pork (ES)	B3	ES	Murcia	high	competition	developed economy, rural	G	-3	No	basic	**LOW**	**LOW**	medium
Pork (HU)	B3	HU	Bacs-Kiskun	intermediate +	coexistence	transition economy, rural	G	-3	No	basic/ up-to-date	**high**	high	medium
Pork (RO)	B3	RO	Timi	low	coexistence	transition economy, rural	G	-3	No	basic	**medium**	**LOW**	low
Rapeseed (PL)	B3	PL	Chelmsko-zamojski	intermediate -	coexistence	transition economy, rural	G	-3	No	basic	high	high	medium
Sunflower oil (HU)	B3	HU	Bacs-Kiskun	intermediate +	coexistence	transition economy, rural	G	-3	No	basic/ up-to-date	high	**LOW**	high

(continued)

Supply chain	Typology	representativeness in the region	extension	Consumption	Market	standard/ unique	conventional/ organic	direct/ indirect	if indirect: relationships in the supply chain	Dichotomy in farm sizes	Producer organisation
									SUPPLY CHAIN		
Beaufort cheese (FR)	A1	important	PPICI	I	local	**UNIQUE**	conventional	indirect (+direct)	cooperatives	low	Yes
Schnapps (AT)	A1	important	PIOPICIO	IO	local, international	**UNIQUE**	conventional	**DIRECT**	self-consum./market	HIGH	No
Speck (IT)	A1	important	POPICO	O	national, international	**UNIQUE**	conventional	indirect	market	HIGH	Yes
Wine (IT)	A1	important	PPICIO	IO	local, national (international)	**UNIQUE**	conventional	indirect	cooperatives	HIGH	Yes
Apples (IT)	A2	leading	PPICO	O	international	**UNIQUE**	conventional	indirect	cooperatives	low	Yes
Hop (PL)	A2	medium	PPIOCI	I	local	**UNIQUE**	conventional	indirect	market	HIGH	Yes
Synnove cheese (NO)	A2	medium	PIOPICIO	IO	national	standard	conventional	indirect	market	low	No
Brodowin milk (DE)	A3	marginal emerging	PPICIO	IO	regional	**UNIQUE**	**ORGANIC**	indirect (+direct)	direct+market	low	-
Goat cheese (FR)	A3	marginal emerging	PPICI	I	local	standard	conventional	**DIRECT**	direct	low	Yes
Wood (DE)	A3	important	PPIOCO	O	regional, national, international	standard	conventional	indirect	cooperatives, contracts, market	HIGH	Yes
Cereals (RO)	B1	leading	PPICI	I	local	standard	conventional	indirect	market	low	Yes (politic)
Milk (PL)	B1	important	PPICI	I	local	standard	conventional	indirect	market	HIGH	No
Beef (IE)	B2	leading	PPICO	O	national, international	standard	conventional	indirect	market	low	No
Butter (IE)	B2	important	PPICO	O	international	standard	conventional	indirect	cooperatives	low	Yes
Lettuce (UK)	B2	important	PPICO	O	national	standard	conventional	indirect	market	low	Yes
Milk (FR)	B2	medium	PPICIO	IO	regional	standard	conventional	indirect	cooperatives	low	Yes
Milk (UK)	B2	important	PPICI	I	local	standard	conventional	indirect	cooperatives	low	Yes
Maize (HU)	B3	important/leading	PPICIO	IO	regional	standard	conventional	indirect	contract	HIGH	No
Milk (AT)	B3	leading	PIPOCIO	IO	national	standard	conventional	indirect	market	low	Yes
Milk (RO)	B3	important	PPIOCIO	IO	national	standard	conventional	indirect	contract/market	HIGH	Yes
Pork (ES)	B3	important	PPICO	O	national	standard	conventional	indirect	integration contract (contract production)	low	No
Pork (HU)	B3	medium (lot of self-consumpt.)	PPICIO	IO	national	standard	conventional	indirect	contract	HIGH	No
Pork (RO)	B3	important	PPICO	O	national	standard	conventional	indirect	contract/market	HIGH	No
Rapeseed (PL)	B3	important	PPICO	O	national	standard	conventional	indirect	contracts	low	No
Sunflower oil (HU)	B3	important	PPICIO	IO	national, (international)	standard	conventional	indirect	market	HIGH	No
UHT milk (NO)	B3	leading	PIOPICIO	IO	national	standard	conventional	indirect	cooperative	low	Yes

(continued)

Supply chain	Typology	SUPPLY CHAIN				NETWORKS					Note1
		Producer organisation	Interprof. organisation	Dynamics: adaptability	Dynamics: perspectives	relations with other supply chains of the region	Economic sector	Environment	Research/ Education	Local gvt	
Beaufort cheese (FR)	A1	Yes	Yes	medium, minor shift	no significant future shifts	No	medium	medium	high	high	2
Schnapps (AT)	A1	No	No	high, major shift	in growth	No	medium	low	low	low	-1
Speck (IT)	A1	Yes	No	high, major shift	in growth	No	high	low	low	high	2
Wine (IT)	A1	Yes	?	low	behind	No	high	low	high	high	3
Apples (IT)	A2	Yes	Yes	medium, major shift	in decline	No	medium	low	medium	high	2
Hop (PL)	A2	Yes	No	high, major shift	in growth	No	low	low	low	low	-2
Synnove cheese (NO)	A2	No	No	medium, major shift	in growth	Yes	low	low	low	low	0
Brodowin milk (DE)	A3	-	-	high, major shift	in growth	Yes	low	high	high	high	3
Goat cheese (FR)	A3	Yes	No	medium, major shift	in difficulty	No	medium	medium	low	high	2
Wood (DE)	A3	Yes	No	high, major shift	in growth	Yes	medium	high	high	high	3
Cereals (RO)	B1	Yes (politic)	No	low	in difficulty	No	low	low	medium	low	-1
Milk (PL)	B1	No	No	low	in difficulty	No	low	low	low	medium	-1
Beef (IE)	B2	No	No	medium, major shift	no data	No	low	medium	low	high	2
Butter (IE)	B2	Yes	Yes	low	in difficulty	No	low	medium	low	high	2
Lettuce (UK)	B2	Yes	No	medium, major shift	behind	Yes	medium	low	low	medium	1
Milk (FR)	B2	Yes	No	low	in difficulty	Yes	low	medium	low	high	2
Milk (UK)	B2	Yes	No	medium, major shift	behind	Yes	medium	low	low	medium	1
Maize (HU)	B3	No	No	low	in difficulty	Yes	low	low	low	medium	0
Milk (AT)	B3	Yes	No	high, major shift	in growth	No	medium	low	low	high	2
Milk (RO)	B3	Yes	No	medium, major shift	in growth	No	low	low	medium	low	-1
Pork (ES)	B3	No	No	medium, major shift	in difficulty	No	low	low	low	high	1
Pork (HU)	B3	No	No	medium, major shift	behind	Yes	low	low	low	medium	0
Pork (RO)	B3	No	No	high, major shift	in growth	Yes	low	low	low	low	0
Rapeseed (PL)	B3	No	No	low	in difficulty	Yes	low	low	low	medium	0
Sunflower oil (HU)	B3	No	No	low	in difficulty	No	low	low	low	medium	-1
UHT milk (NO)	B3	Yes	Yes	low	behind	Yes	low	low	low	high	1

(continued)

Supply chain	Typology	Economic sustainability	Economic S. production	Social sustainability	Social S. production	Environmental sustainability	Environ. S. production	Employment	Environment	Social
						OUTCOMES				
Beaufort cheese (FR)	A1	good	good	good	good	medium	medium	low, high SE	high positive, low negative	high
Schnapps (AT)	A1	good	good (n.d.)	medium	medium (n.d.)	medium	medium (n.d.)	low, high SE	low positive	high
Speck (IT)	A1	good	good	medium	medium	bad	bad	low, no SE	low negative	high
Wine (IT)	A1	medium	medium	good	good	medium	medium	low, high SE	high positive	high
Apples (IT)	A2	good	good	medium	medium	medium	medium	high, high SE	high, positive, negative	high
Hop (PL)	A2	medium	good	bad	medium	bad	bad	low, low SE	low negative	medium
Synnove cheese (NO)	A2	good	good	medium	good	bad	medium	medium, no SE	medium, negative	medium
Brodowin milk (DE)	A3	bad	medium	medium	good	good	good	low, no SE	high positive, low negative	high
Goat cheese (FR)	A3	medium	medium	good	good	medium	medium	low, high SE	medium positive	high
Wood (DE)	A3	bad	bad	bad	bad	bad	good	low, no SE	high positive	high
Cereals (RO)	B1	good	good	bad	bad	bad	bad	high, high SE	medium, negative	low
Milk (PL)	B1	bad	bad	bad	bad	bad	bad	high, high SE	low negative	low
Beef (IE)	B2	medium	medium	medium	medium	medium	good	high, high SE	high positive	high
Butter (IE)	B2	good	good	medium	medium	medium	medium	high, high SE	high positive	high
Lettuce (UK)	B2	good	good	bad	bad	medium	medium	low, no SE	medium, negative	low
Milk (FR)	B2	medium	medium (n.d.)	medium	medium (n.d.)	bad	bad (n.d.)	low, high SE	medium positive	low
Milk (UK)	B2	good	good	bad	bad	bad	bad	low, low SE	high, positive, negative	low
Maize (HU)	B3	good	good	bad	bad	bad	medium	high, high SE	low negative	low
Milk (AT)	B3	medium	medium (n.d.)	medium	medium (n.d.)	medium	medium (n.d.)	high, high SE	medium positive	high
Milk (RO)	B3	medium	medium	bad	bad	bad	bad	medium, high SE	low negative	low
Pork (ES)	B3	good	good	medium	medium	bad	medium	medium, high SE	low negative	high
Pork (HU)	B3	medium	good	bad	bad	bad	good	high, high SE	low negative	low
Pork (RO)	B3	good	good (n.d.)	medium	medium (n.d.)	bad	bad (n.d.)	medium, high SE	medium, negative	medium
Rapeseed (PL)	B3	medium	medium	medium	medium	medium	medium	low, high SE	low negative	low
Sunflower oil (HU)	B3	good	good	medium	medium	bad	medium	low, high SE	low, positive, negative	low
UHT milk (NO)	B3	good	good	good	good	bad	medium	medium, high SE	medium, positive	high

N.b.: for the three dimension of sustainability, the first column indicates the results for the whole supply chain and the second one the results for the production stage only.