THEORETICAL AND POLICY BACKGROUND TO THE TOP-MARD PROJECT (TOWARDS A POLICY MODEL OF MULTIFUNCTIONAL AGRICULTURE AND RURAL DEVELOPMENT)

John Bryden[1], Amaia Arandia[2] and Tom Johnson[3]

[1]**UHI Policy Web, Scotland** john.bryden@inverness.uhi.ac.uk (corresponding author)

[2]**UHI Policy Web, Scotland** amaia.arandia@uhi.ac.uk

[3]**University of Missouri-Columbia, US** JohnsonTG@missouri.edu

UNIVERSIDAD PABLO DE OLAVIDE SEVILLA

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Abstract

The TOP-MARD project is a 3-year, 11 country, project supported by the EU's Framework 6 Programme for Research and Technology Development[1]. The aim of the research project was to build a policy model of multifunctional agriculture and rural development which would link the multiple functions of agriculture with the development and quality of life of rural regions, and explore the influence of different policies on rural development outcomes. In order to deal with both market and non-market outputs, and to explore dynamics over time, a systems modelling approach was adopted.

1. Theoretical background

It is generally recognised that farmers, foresters and other land users perform several functions for society other than their usually primary market function of producing food and raw materials. According to Eurochoices (Cahill, 2001) there are a number of different non-commodity outputs that can be covered in a review of the relationships between multifunctionality and rural viability, particularly agricultural employment, landscapes, environmental quality and food security.

In general, these functions may or may not be 'tradeable' in the sense of providing the producer with a monetary return. 'Non-tradeable' functions are generally public or quasi-public goods and typically concern the production of 'environmental' goods such as rural landscapes, but also quality products and sustainable rural development, as by-products from commercial activities. Typically, the combination of tradeable and non-tradeable functions is described as 'multifunctionality', and, especially when applied to the sector of agriculture, this term is endowed with both theoretical and practical policy significance. In the TOP-MARD project, we are concerned with the relationships between agricultural multifunctionality (traded and non-traded goods and services produced) and territorial rural development (the development of rural regions, for example NUTS III Regions defined as 'predominately rural' or 'intermediate' by the OECD 1994 classification, and including small towns etc.). This is because EU 'rural policy' as it has emerged in the past 20 years or so has a 'double mandate' – first to secure 'the European Model' of agriculture as a competitive but environmentally friendly sector; second to improve living standards and quality of life of people living in rural regions (Bryden & Hart 2004).

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Although most writers take a somewhat 'strict' view of 'multifunctionality' by confining it to 'joint products', implying that the production of a non-tradeable good or service requires the simultaneous production of a tradeable, Buckwell argues that the most common relationship is one of 'competition', while the OECD argues that the available evidence suggests that most significant non-tradeable, non-market, externalities in agricultural systems are produced either jointly or in competition with tradeable, market goods and services (OECD, 2001). The possibility of competition, as a principal relationship, means that an activity involving the production of a tradeable will reduce the production of non-tradeables and vice-versa. However, if we include such non-tradeables as cultural continuity or non-traded value relating to contributions to rural employment and enterprise, both of which are relevant to the wider development of rural regions, it is clear that a broader definition is needed, since no joint production with particular commodities is implied or needed, and competition is not necessarily present.

From a theoretical point of view, the issue is a sub-set of general theories of 'externalities' in production processes, much discussed for example in relation to regional development (e.g. Marshall, 1890; Krugman, 1990) and the related clustering of economic activities, as well as in the growth of firms. Thus, non-pecuniary externalities such as ready access to information about markets and competitors' behaviour, as well as access to high value R&D and design services, are held to be important for the development of cities in regional economics (Richardson, 1968). In the same way that Regional and Firm Economics recognises that both pecuniary and non-pecuniary external diseconomies can and do exist, so too the discourse on agricultural multifunctionality recognises that some non-tradeables (externalities) have negative impacts (for example, pollution). However, for the purposes of TOP-MARD, the central theoretical idea is that non-tradeables or externalities created within agriculture (and elsewhere, in a wider set of natural and man-made amenities) enter into the production function of new economic activities such as tourism and recreation, as well as other new goods and services such as specialised crafts, drink, foods, and cultural artefacts which are increasingly to be found in diversified rural regions. The idea that there are latent "non-mobile" assets that are important for rural areas that can be traced back to a paper for a 1991 EAAE seminar by Cavailhes *et al*. (1993). Bryden developed this argument to some extent in a book on sustainable rural communities (Bryden, 1994), and in subsequent work with Shirley Dawe (Bryden & Dawe, 1998; Dawe & Bryden, 1999) and then within the DORA research project, which examined differential economic performance in 16 rural study areas of 4 countries. The work of the OECD (1999) on amenities in rural development, and that of McGranahan (1999), Deller (2001) and Green *et al.* (2005) on amenities and rural migration patterns in the USA is also relevant, confirming that non-agricultural 'externalities' are also very important for rural development today.

In the 1988 paper on economic development in the predominately rural areas commissioned for an OECD conference we argued that "*important cases exist where such areas have developed effective local strategies to deal with, and indeed capture new opportunities from, globalisation. These strategies essentially involve focusing on 'non-mobile' or 'less mobile' assets. In turn, many of these less mobile assets turn out to be public or quasi-public goods on the one hand or 'positional goods or services' in the sense used by Hirsch (1976) on the other (these are not mutually exclusive categories). However, whether mobile or not, the ways in which more 'tangible' resources like the land, natural resources, people and capital are put to effective local use seems to depend on a set of 'less tangible' factors like institutional performance, local culture, and a group of factors relating to effective access to resources"… the OECD's (1994) work on territorial indicators has informed us that some peripheral localities performed much better than others and, in some cases, better than urban areas (this also accords with experience on the ground, in the form of casual observation). We argue that that such differences cannot be explained in terms of traditional theories (either core-periphery or neo-classical). The explanation lies in local capacities to develop and exploit less mobile assets, in the form of economic, social, cultural and environmental capital, and the synergies between these assets. One such asset, but only one, is what is now termed 'amenities' - we suggest that we need to look further than this to both understand differential performance and frame local development strategies in a context of globalisation. In particular, we need to pay more attention to the range of immobile or less mobile assets which are specific to individual rural areas, the relationship between these and assets which are more mobile, and the role of less tangible factors in valorising these assets within the local economy. (Bryden & Dawe 1998: p2).*

The idea was later termed the 'Bryden theory' by Terluin (2003) who tested it against other rural and regional development theories, using the results of the RUREMPLOI project (Terluin and Post 2001). Terluin concluded that the theory had the best explanatory power of those examined.

The role of tangible and less tangible assets in the differential development of rural regions was more thoroughly examined in the 'matched pairs' approach of the Dynamics of Rural Areas Project from 1999 to 2001 (Bryden, Hart *et al*., 2001 and 2004). Success in this case was largely measured by the ability to hold or increase (through net in-migration) population in rural regions. The authors concluded "Our analysis of the relative importance of the different factors explaining DEP between the pairs of study areas in each region led to identification of six key inter-related themes which together explain why some rural areas are doing better than others:

- Culture and society in the shift from state to market
- Peripherality and infrastructure
- Governance, public institutions and investment
- Entrepreneurship

- Economic structures and organisation
- Human resources and demography"

In addition, the development of economic activities that transformed natural and cultural assets into commercial activities was a cross cutting theme in stronger economic performance.

It is this growing body of empirically-informed theory that potentially links the production of 'externalities' (positive or negative) on farms with the development of rural territories, and which lies at the heart of the thinking behind the TOP-MARD project.

2. Policy background

From a policy point of view, many non-market goods and services produced by farming and farm households are it seems *desired* both for their own attributes (e.g. species rich meadows) and for their potential impact on rural development. However, the main instruments of EU policy lie within policy payments such as those under the Rural Development Regulation which can be used to persuade and/or compensate farmers for the production of such desired outputs. In addition, the EU seeks to penalise negative externalities through regulation aimed at preventing or reducing undesired non-market outputs such as water or air pollution. Cross-compliance is a further instrument intended to ensure that recipients of single farm payments comply with the standards of environmental regulations. However the EU's rural development policy money is largely spent on agri-environmental and related schemes (Critica, 2007), and may thus be regarded as being mainly at increasing the 'supply' of (or perhaps reducing the decline in) environmental goods and services, or positive environmental services related to farming. They are less evidently targeted at territorial development, or the transformation of positive externalities of farming into new economic activities and quality of life of rural residents. Apart from anything else, this is something agricultural ministries and departments[2], steeped as they are in agricultural structures and markets policies the goals of which were supply-orientated, have little or no experience with, One exception exists, and it is the relatively tiny LEADER programme, which some countries and regions have used creatively to create such synergy between agricultural externalities and territorial development (Bryden, 2007).

At the same time, the rhetoric of EU 'rural policy' demands that it goes further than the supply of agricultural externalities. Since the Maastricht Treaty (2002), territorial and social cohesion has been an objective of 'rural' as much as 'regional' or 'social' policy. And the policy documents (including the Rural Development Regulation) emphasise the importance of improving the quality of life of rural residents. This is critical if people are expected to stay in, come back to, or migrate to,

[2] Even if they have been re-named as 'rural development' Ministries or Departments, since the policy experience of the incumbents remains rooted in the practices of the past.

otherwise declining rural regions. There is little doubt that this will become one of the core issues to be dealt with following the EU 'health check' on the CAP and the budget review, both precursors to the next reform of the CAP and the Structural Funds in 2013.

3. The approach of the TOP-MARD research project

Building on these theoretical foundations and practical policy considerations, the TOP-MARD project is designed to analyse how the various functions of the agricultural sector affect the sustainable economic development and the quality of life of a given territory, and how different policies affect these relationships. A central hypothesis is that these relationships differ according to a rather wide range of institutional and other factors that vary between regions as well as between policies. The view is that these relationships may be highly dynamic with numerous feedback effects.

Within TOP-MARD we have developed a systems model using the Stella™ software to capture the dynamics and spatial dimensions of these relationships in 11 study areas representing different types of rural areas in different European countries. The study areas, shown on the MAP, are selected to be diverse, and to roughly 'represent' the diversity of rural regions in the enlarged EU. The systems model and its functioning is being illustrated by at least two parallel papers at this seminar (Johnson, Refsgaard and Bryden; Refsgaard and Prestegard).

The systems modelling approach differs from traditional economic modelling in that it sees economic activity and behaviour as being embodied in the natural (environmental or ecological) and social systems. It also sees these relationships as being fundamentally dynamic. This contrasts with the generally more static and linear thinking of conventional economics where, for example, impacts of economic activities on the ecosystem are handled outside the system not influencing the agricultural productivity directly or where the composition of different economic activities does not influence the social or cultural capital and, through that, the overall well-being of the system.

STELLA was chosen as the platform for the TOP-MARD model for several reasons. First, it is a powerful yet relatively user-friendly as well as dynamic modelling system, which is needed if the model is to be useful to policy makers. Second, STELLA is ideal when one of the goals is to encourage systems thinking in research and education. Third, STELLA is designed to help multidisciplinary teams work through complicated problems where a large number of feedback loops, and temporal lags and processes dominate. And finally, it is designed to accommodate systems that include qualitative, and difficult to quantify data.

The unique aspect of TOP-MARD concerns the linking of functions of agriculture with the development of the local territory and quality of life in a large range of different rural contexts. In exploring this intellectual and policy domain, conventional tools of economic, social and geographical analyses are not adequate. We have therefore opted for a systems approach, so that the dynamic relationships between agricultural functions (market, non-market, and hybrid) and the success or failure of local economies and societies, and the role that different policies have in these relationships, can be formally explored and tested. In this way we have a model that can examine the impacts on both farm households and local communities of expansion or contraction of policy effort in different areas and different contexts. The model should thus be helpful for policy development and prioritisation at both local and EU levels.

4. Methods

A systems model is intended to be discipline-neutral and encourage inter-disciplinary working. Thus the language used may confuse some who are rooted in disciplinary language. In Stella, the 'systems dynamics' are generated from a set of initial conditions through a series of shocks to stocks and flows which, in turn, reverberate through the system. The shock in our case comes from a policy change (a new policy scenario) or a change in market conditions (built into a scenario, and especially dealing with agricultural commodity prices on the one hand, and energy prices on the other. The model includes a regional social accounting matrix, which is important for tracing the regional economic impacts, and modular elements for resources (land, human resources, capital), quality of life, migration and demography, agriculture (producing market and non-market 'commodities', capital, tourism (the most common 'transformation' sector), quality of life, and the rest of the world (everything outside the region). It is populated either by existing data, or new data gathered by special surveys of farmers, enterprises, citizens, and key agents, designed by the team of researchers. The most difficult part was probably the estimation of important new coefficients, such as the elasticity's of migration response to different changes in quality of life elements. In addition, teams identified the various market and non-market functions of agriculture relevant in their study areas, while a policy group led by Professor Ken Thomson worked on a set of policy scenarios to be used with the model.

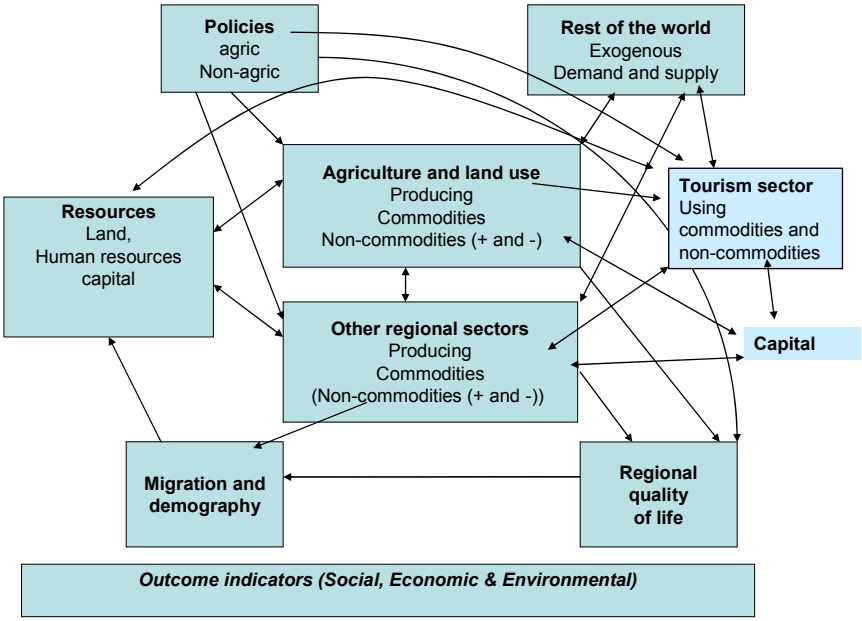

Figure 1: The structure of the TOP-MARD policy model.

5. Conclusions

The TOP-MARD team has built a core model to explore the relationships between agricultural multifunctionality, territorial rural development and quality of life, and the impacts of different kinds of policies on these relationships. It is 'work in progress'. More detailed analysis of the model itself and its working in a particular context can be found in the papers to be presented at this EAAE seminar by Johnson, Refsgaard and Bryden, and by Refsgaard and Prestegard, among others. The research is currently being finalised, and the model is being adapted to the 11 participating rural regions. Comparative analysis of the results remains to be undertaken. The research will be completed in 2008.

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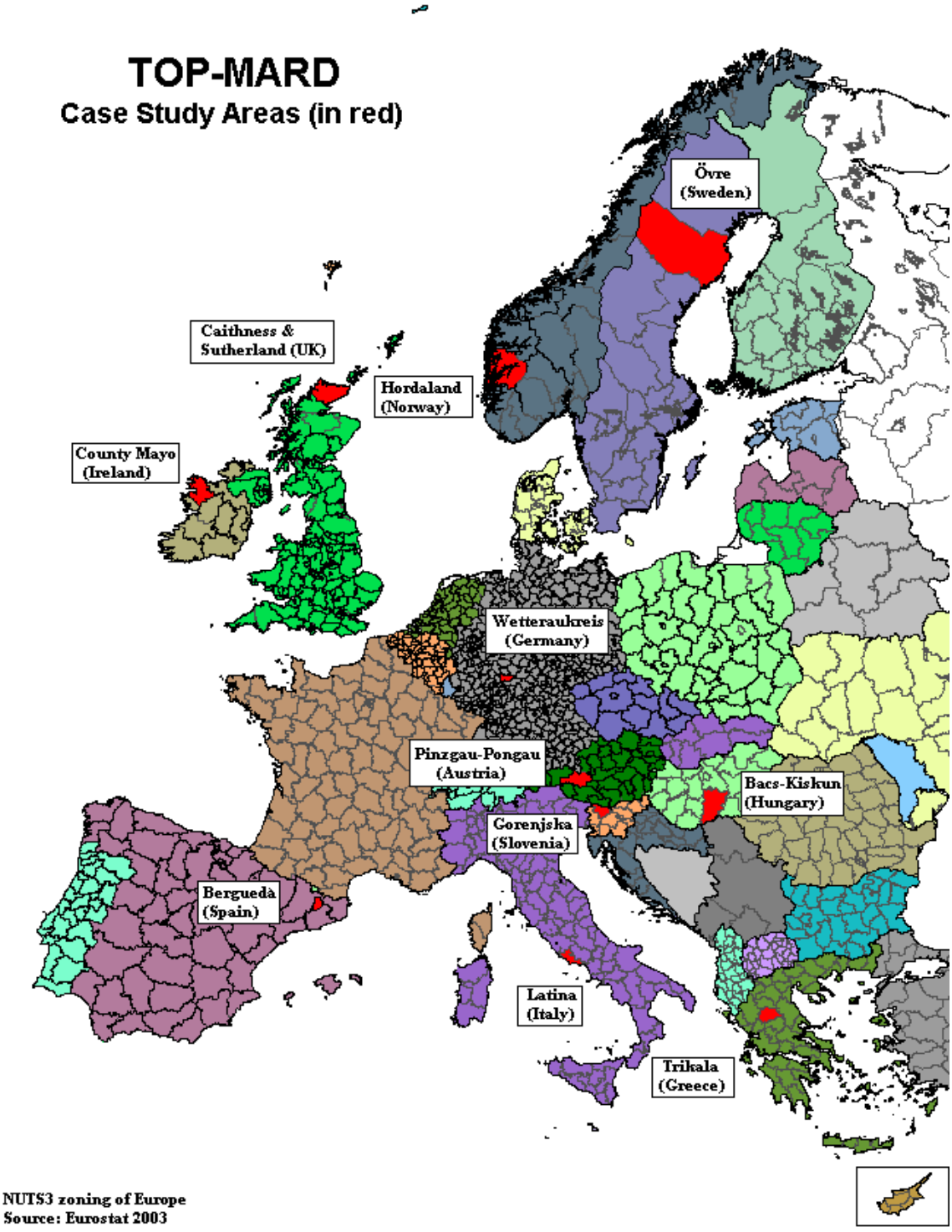
TOP-MARD
Case Study Areas (in red)
Övre (Sweden)
Caithness & Sutherland (UK)
Hordaland (Norway)
County Mayo (Ireland)
Wetteraukreis (Germany)
Pinzgau-Pongau (Austria)
Bacs-Kiskun (Hungary)
Gorenjska (Slovenia)
Berguedà (Spain)
Latina (Italy)
Trikala (Greece)
NUTS3 zoning of Europe
Source: Eurostat 2003