



# **Sustainability of the Farming Systems: Global Issues, Modelling Approaches and Policy Implications**

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## **PREFACE**

The interest related to agricultural sustainability in general, and farming systems in particular, gained recently in importance on the research agenda of the Institute for Prospective Technological Studies of the Directorate-General Joint Research Centre of the European Commission. Within the series of activities related to positioning the Institute with respect to this topic, two expert workshops were organised in 2004 and 2005.

The specific issues addressed during the 2004 workshop referred at the likely impact of the 2003 reform of the Common Agricultural Policy on the ability of the farming systems in the new Member States of the EU (the 2004 Enlargement) to compete within the enlarged common market and the regional capabilities to support production, income and farming communities' livelihoods. The conclusions of the workshop indicated that, apart from definitional challenges, development of appropriate analytical tools to assess the reach of sustainability objectives is equally important in order to provide relevant input to the policymaking agenda. Field-level information regarding characteristics and challenges farming systems face in the new Member States is needed to support the policy decision-making, to understand the effects of implementing the reform, and to better target policies aimed at supporting their sustainable evolution. The oral presentations and associated papers are available from [http://www.jrc.es/home/events/workshop\\_sept\\_04.htm](http://www.jrc.es/home/events/workshop_sept_04.htm).

Building on the outcome of the first workshop, a second one was organised in 2005, aiming to contribute with additional details on (a) the existing and emerging new analytical tools related to policy impact assessment and (b) recent empirical evidence on the implementation of the 2003 CAP reform. Experts from several projects financed by the European Commission under the Sixth Framework Programme, relevant for the topic of the workshop, were invited to present their methodological approaches and some preliminary results (where available). The conclusions of the workshop enhanced the view that two trends in the current modelling tools exist. On the one hand, existing large EU-wide modelling tools are now broadened to cover all EU27 Member States while, on the other hand, new ones are developed to incorporate the new policy concepts and instruments the 2003 CAP reform introduced. At the same time, national experts from the new Member States, Accession and Candidate Countries were invited to present relevant aspects related to the implementation of the reform and its expected impact in the own country context. The oral presentations and associated papers are available from [http://safh.jrc.es/WS\\_implementingCAP\\_NMS\\_2005.htm](http://safh.jrc.es/WS_implementingCAP_NMS_2005.htm).

This report brings together the contributed papers the speakers to the two workshops were invited to submit in support of their oral presentation. The papers reflect the opinions of the corresponding authors and do not represent the official position of the European Commission.

# **Part I:**

## **Global and Policy Issues**



# **Sustainability of agricultures and globalisation**

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During the second half of the 20<sup>th</sup> century, the world's population multiplied by a 2.4 factor, i.e. it increased from 2.5 billion persons in 1950 to 6 billion in 2000, while over the same period, agricultural and food production multiplied by a 2.6 factor (FAO, Faostat). Thus, the latter progressed a little more quickly than the population. Furthermore, the global agricultural output growth has been much higher during the last 50 years than during the 10,000 years of agricultural history.

While bypassing the most optimistic expectations, this gigantic progress has however limits and drawbacks: three quarters of the peasants of the world are still working with manual tools only (e.g. hoe, spade, digger stick, machete, harvester knife, sickle, etc.). Meanwhile, one third of humanity suffers from serious food deficiencies, and farmers constitute the majority of the poor and of the undernourished of the planet.

What is more precisely the world food and agricultural situation?

What are the causes and the consequences of that situation?

Which prospects and which remedies can be envisaged?

These are the questions treated in this paper.

## **Food and agricultural deficiencies**

Out of some 6.4 billion people on the planet nowadays, approximately 2 billion suffer from malnutrition due to lack of minerals (e.g. iron, iodine) or vitamins (e.g. A, C). Furthermore, 840 million (of which 800 million in developing countries, 30 million in former communist countries and 10 million in developed countries) suffer from under-nourishment, or in other words, they go hungry almost every day (FAO, 2003).

According to FAO, about three quarters of the undernourished people live in rural areas. The majority of them are farmers, very ill-equipped, badly located (living in difficult regions), with little land allotments, and poorly paid agricultural labourers. As for the other undernourished, the majority of them are former rural inhabitants who have been pushed to out-migrate towards ill-equipped and under-industrialised urban slums, where unemployment and low wages prevail, and where they have not found yet proper means of making a living.

However, despite the fact that rural-urban migration affects approximately 50 million persons per year, the number of poor and undernourished in rural areas hardly decreases. That means that at least 40 million new poor and undernourished appear each year in rural areas of the world.

For 1.3 billion people who are economically active in agriculture in the world, we count 28 million tractors only (FAO, Faostat), and 250 millions draught animals, that is around 2 percent and 19 percent respectively of the active agricultural population. This means that the extensive motorisation and mechanisation, that characterise the contemporary agricultural revolution, have

only benefited a tiny minority of the world's farmers. Among these, the best equipped and best located can obtain 2,000 tonnes of grains, or grains-equivalent<sup>1</sup>, per worker and per year. On the other hand, 800 to 900 million farmers regularly use the selected varieties spread with the green revolution, as well as the accompanying mineral fertilisers and pesticides. Depending on their equipment, they can obtain between 10 and a few dozens tonnes of grains per worker and year.

However, 400 to 500 million farmers remain, who have never been in a position to buy either a tractor, a draught animal, a cultivator, selected seeds, mineral fertilisers, or pesticides. Those farmers obtain no more than one tonne of grains-equivalent per worker and year. Moreover, in many former colonial or communist countries without significant recent land reform, most ill-equipped small farmers are largely deprived of land by the vast estates of several thousand or tens of thousand hectares i.e. the *latifundia*. As a consequence, those farmers are confined to micro-holdings of a few hundred square metres only – less than what they could cultivate –, and well below the area needed to cover household food requirements. Therefore, these ill-equipped and quasi-landless peasants have to seek work on a day-to-day basis on the large estates, for wages ranging from 0.25 to 3 Euros per day depending on country and region.

Under such conditions, one can understand why in almost all countries farmers' average income is much lower than urban workers' average income, and even often lower than the wage of unskilled labour. One can also induce why poverty and hunger are particularly widespread among peasants. However, the mechanisms that led to such a situation remain to be understood.

## Unequal development

At the beginning of the 20th century, the vast majority of world's farmers used exclusively hand tools. Their labour productivity did not exceed one tonne of grains-equivalent per worker and per year. Meanwhile, in industrialised countries, some farmers using new animal drawn machinery (mowing machines, reaping-binding machines etc.) could cultivate around 10 hectares each, which resulted in a gross productivity of 10 tonnes of grains per worker and year. So, at that time, the gross labour productivity gap between the weakest and the highest performing agriculture in the world was ranging between 1 and 10 (Mazoyer and Roudart, 2002).

During the second half of the 20th century, the contemporary agricultural revolution spread in developed countries and in certain limited sectors of developing countries. In developed countries, an ever smaller number of family farms succeeded in stepping over all the stages of this revolution. For example, regarding the cereals production, the power of tractors and hence the maximum area cropped by a worker have almost doubled every ten years, so that nowadays one worker can cultivate more than 200 hectares of cereals. At the same time, given the use of selected seeds, mineral fertilisers and pesticides, the output increased by more than one tonne per hectare every ten years, and reaches almost 10 tonnes per hectare today. Thus, the maximum labour productivity today reaches approximately 2,000 tonnes per worker and year.

However, from the 1960s on, those farmers in developing countries who could afford it, and when supported by public policies, embarked on the green revolution, a variant of the contemporary agricultural revolution that excludes large motorised and mechanised equipment. Then, starting from the middle of the 1970s, investors of different profiles (e.g. entrepreneurs and local landlords, large international holdings, food product manufacturers, wholesalers, investment funds etc.), benefiting from the experience acquired by farmers of the South and the North as regards the green revolution and the contemporary agricultural revolution, embarked on the rapid modernisation of *latifundia* in several countries from Latin America (e.g. Argentina, Brazil, Mexico etc.), Africa (e.g. South Africa, Zimbabwe etc.), and Asia (e.g. Philippines, India

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<sup>1</sup> The grains-equivalent is the quantity of grains having the same caloric value as the agricultural production considered.

etc.). Since the 1990s, they have undertaken the modernisation of large state or collective estates in countries of the former USSR and in Eastern Europe. In these modernised *latifundia*, the levels of equipment and of productivity quickly became comparable to those of the best performing North-American and Western-European farmers.

By contrast, in vast areas of Africa, Asia and Latin America, where many farmers engaged in rainfed or poorly irrigated agriculture, they have never been in a position to acquire the means of production of the green revolution or of the contemporary agricultural revolution. Accordingly, they could never increase yield or productivity. Thus, during the second half of the 20th century, the gross labour productivity gap between the weakest and the best performing farmers worldwide was multiplied by 200. Today it ranges from one to 2000 tonnes of grains-equivalent per worker and year.

### **The downward trend of real agricultural prices**

In those countries where the contemporary agricultural revolution progressed most, productivity gains in agriculture have been so high that they outrun those of other economic sectors. As a consequence, real agricultural prices (inflation taken off) have fallen sharply. Moreover, in some of those countries, agricultural production increased much more quickly than domestic consumption, so that the exportable surpluses strongly increased.

In some developing countries where the green revolution has advanced, production growth has outrun that of population. But, since global consumption has been limited by the very low wages of most of the population, some of these countries (e.g. Indonesia, Thailand, Vietnam) began to export rice at low prices, although under-nourishment continued to prevail there.

Finally, in the recently modernised *latifundia* of the former colonised or communist countries, agricultural cost prices are even lower. Here, indeed, wages paid to agricultural labourers do not exceed a few tens of euros per month, while other costs (e.g. land rents, taxes etc.) are usually very low, and local currencies are often undervalued. As a consequence, these large estates produce at very competitive prices: i.e. 80 euros per tonne of wheat, 140 euros per tonne of soybean; one euro a kilo of red meat, 0.5 euro a kilo of white meat, or 0.1 euro a kilo of milk. These prices are equal to almost half the average cost prices of North-American and Western-European family farms, and they are 5 to 6 times lower than the prices of the years 1950 in real terms. However, as these large estates are located in countries with very high rural and urban unemployment, with low wages and under-nourishment, they seek to export on international markets.

On the other hand, because of (i) the very significant decrease in international transport costs during the last decades, (ii) the lowering of tariff and non-tariff barriers to international trade, always renewed strata of small farmers in the developing countries have had to face the competition of agricultural commodities coming from international markets at ever-lower prices. As a consequence, they also have had to sell their output at ever-lower prices.

International markets of agricultural commodities are supplied by surpluses from developed and developing countries. But they account for only a modest proportion of the world production and consumption, e.g. approximately 15% in the case of cereals. Thus, international markets are residual markets, where prices are particularly low, i.e. approximately equal to the cost prices of export-oriented *latifundia*. But, as already said, these prices are much lower than the cost prices of the very large majority of the world's farmers. By selling their output at these prices, even the majority of farmers in developed countries would obtain a zero or negative income. Thus, they could neither resist the competition of international markets nor stay in business for a long time. If they do, in fact, it is because they belong to high income countries concerned with their food self-sufficiency, and maybe with their food power, which therefore devote public funds to support agricultural producers.

In addition to the low level of agricultural prices, there are ample fluctuations of these prices in countries where no price stabilisation policy is implemented.

## **Consequences**

In developed countries, the strong fall in real agricultural prices led to a strong fall in income for small- and medium-sized farms. When having become unprofitable, they were generally not taken over when their farmers retired. This was the process by which 90% of the farms existing at the beginning of the 20th century have disappeared. In these countries, farmers' inheritors abandoned agriculture and generally have found jobs in industries or services. But, for the tens of millions of poor farmers who were forced to rural-urban migration in developing countries, the situation was very different. In their case indeed, ill-equipped, badly located and poorly productive peasants confronted to declining real agricultural prices first experienced a decrease in their purchasing power. Most of them eventually found themselves in a position where they were unable to invest in more effective farm tools, and sometimes even to purchase selected seeds, mineral fertilizers and pesticides. That is to say their development was blocked. Then, the decline in prices going on, their cash income became no longer sufficient to both renew farm tools and buy a few vital consumer goods.

To better understand this mechanism of extreme impoverishment, let us consider the case of a Sudanese, or Andean, or Himalayan cereal farmer using manual tools only and producing, without mineral fertiliser or pesticide, 1 tonne of grain net per year (without including seeds for the following year). Some 50 years ago, such a cereal farmer received the equivalent of 40 euros (at 2004 value) for 100 kg of grain; he had to sell 200 kg to renew his hand tools, clothing, etc., and was left with 800 kg to feed, modestly, a family of four persons. Denying himself a little, he could even sell an extra 100 kg to buy a new and more effective farm tool. Some 20 years ago, he received no more than 20 euros (at 2004 value) for 100 kg, he then had to sell 400 kg to renew his hand tools and other essential goods, and he was left with 600 kg to feed, inadequately, four persons. Under such conditions, he had no possibility of buying a new and more efficient farm tool. Today, he receives 10 euros only for 100 kg of grain, which means that he would have to sell more than 800 kg to renew his equipment and other basic goods, leaving him with 200 kg only to feed four persons, which is of course impossible. In fact, at this price, he can no longer fully renew his working tools, modest though these are, or satisfy his consumption needs and restore his working force. So, he is condemned to indebtedness, and then to migration to the under-equipped and under-industrialised urban slums, where unemployment and low wages prevail.

The downward trend and the instability of agricultural prices have other consequences. By excluding from production millions of small farmers each year, and by discouraging the activity of those who stay in business, they bound the agricultural output and increase the food deficit of poor countries. By stimulating rural-urban migration, they contribute to maintaining high unemployment rates and lowering wages in urban areas, as rural migrants are obliged to accept wages that are barely higher than incomes of small farmers marginalised by downward prices. In this context, one may note that the hierarchy of the lowest wages in different parts of the world closely reflects that of small farmer incomes (World Bank, 1986). As a consequence, fiscal receipts in poor agricultural countries are low, too low for these countries to be able to modernize and attract foreign investments. Indebtedness and even over-indebtedness follow which, in many cases, bring to a loss of government legitimacy, ungovernable situations and civil war.

Thus, it is not surprising that half of humanity, living in rural areas or urban slums, has only an absurdly low purchasing power: according to the United-Nations Development Programme, 2.8 billion people live with less than US\$ 2 a day, and 1.2 billion of them have less than one US\$ a day (UNDP, 1999). These very low income levels limit food consumption, and thus agricultural

investment and production. One can hypothesise that this enormous inability to meet basic needs is limiting global consumption, and thus is also limiting global growth.

As a matter of fact, governments of developed countries and international organizations try to remedy farmer purchasing power contraction, by implementing policies supporting farmer income in developed countries, and promoting development, poverty and under-nourishment reduction in developing countries. But, these policies are often contradictory, difficult to finance, to manage and to justify. Finally, they do not meet the problems.

## **Prospects**

In 2050, the Earth will count between 8 and 11 billion humans (United Nations, division of the population, 2001). To feed them properly, without under-nourishment or nutrient deficiencies, the quantity of plant products for feeding humans and domestic animals must more than double around the world. This quantity must almost triple in developing countries, it must increase more than fivefold in Africa, and even more than tenfold in several countries in that continent (Collomb, 1999).

To obtain such an enormous increase in plant production, farming activity must be expanded and intensified in all regions of the world wherever is sustainable possible.

In order to allow all farmers in the world to construct and cultivate sustainable ecosystems, capable of producing a maximum of good quality products without degrading the environment, it is absolutely necessary to put an end to the international agricultural prices war. It is necessary to break with the trade liberalisation which tends to bring prices into line with the lowest offers from surplus exporters. Above all it is necessary to guarantee sufficiently high and stable prices to farmers, in order for them to live from their work with dignity. To this end, it is necessary to create a much more equitable and much more effective organisation for international agricultural trade than the one which is currently in place. A new organisation that would be based upon the following principles:

- establish large regional common agricultural markets, by regrouping countries having similar levels of agricultural labour productivity (West Africa, Southern Asia, Western Europe, Eastern Europe, North Africa and the Middle East, North America, etc.) ;
- protect these regional markets against all imports of low-priced agricultural surpluses by variable customs duties, thus guaranteeing high and stable enough prices to poor farmers from disadvantaged regions, so as to allow them to live from their work and to invest and expand their business operations ;
- negotiate product by product international agreements fixing in an equitable manner an average purchase price on the international market, as well as the quantity and the export price allowed to each of these large markets, and if necessary, to each country.

The rise in agricultural prices will have to be gradual, so as to avoid negative consequences for poor consumers-buyers. In spite of this, it will probably be necessary to implement food aid policies. However, instead of founding these policies based on low-cost food distribution, which maintains peasant misery and reduces domestic markets, it will be convenient to support the food purchasing power of poor consumers, so as to expand domestic markets. Therefore, food aid policies could rely on food stamps, financed by state budgets or international aid, distributed to the needy and for free for the poorest, and exchangeable for food (as in the USA).

However, the rise of agricultural prices alone will not be enough to promote a balanced agricultural development in the various regions of the world, and to upgrade production so as to meet global needs. Agricultural development policies, regional (several countries) and national, will be needed: land legislation guaranteeing broad access to the land and security of tenure (e.g. land reform, land-rental law, legislation against the accumulation of land, etc.); measures

favouring broad access to credit, inputs and equipments; public investments in agricultural infrastructures (e.g. irrigation, drainage, etc.), as well as transport and marketing infrastructures; research and extension services targeted to the needs and means of the different regions and groups of farmers, with the most disadvantaged as top priority; reduction of agricultural income disparities among regions and farms (e.g. differential land tax, gradual taxation on agricultural incomes, targeted aid, etc.).

## Note

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# The reform of the CAP and the economic sustainability of farms - issues flowing from agriculture's complex institutional structure and their associated research needs

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## Abstract

*The existing structure of agriculture is unsustainable in conditions of technological change. Structural adjustment is inevitable, but the complex nature of the farm household-firm means that it has taken many forms. Environmental and social repercussions may follow, though the links with agricultural structure are not clear. Historically, adjustment is often precipitated by shocks, of which policy reform is one type. Policy has mostly been defensive against the economic pressures to adjust by providing income cushions, with measure to assist adjustment being relatively poorly funded. Often national policies are in place that hinders adjustment. In such circumstances existing EU policy is increasingly resource-demanding and unsustainable. When considering future policy reform, there is a need to clarify the aims of policy and to establish better the evidence on the links between them and the structure of agriculture.*

## 1 Introduction

Authoritative studies exist of the impact of the 2003 reform of the CAP on the agricultural markets of the EU15 and enlarged EU25, with much attention given to the relatively-decoupled Single Farm Payment (SFP) and the modulation that is part of the reform (see Commission 2003, which includes output from the University of Bonn and FAPRI). The projections suggest that CAP reform would lead to shifts taking place in cereal, beef and dairy production. Farmers would have to gain efficiency, so some structural change is inevitable, although the extent of this is not explored in this impact analysis. Among the new Member States there will be market opportunities, though this will not be equally shared among regions and, again, structural changes will be expected to occur. What happens to domestic production (the output from household plots) in new Member States is likely to be more dependent on general economic and social development than on agricultural policy (Bascou *et al.* 2004). The purpose of this paper is not to repeat the findings of these studies. Rather it is to consider the implications of the structural changes they point to but do not quantify in terms of the sustainability of agriculture.

Sustainability is a concept inherent to agriculture. Indeed the UK agricultural economist Edgar Thomas commented in the 1940s that any process of food production that was not capable of being carried on indefinitely should properly be classified not with agriculture but with mining. In modern usage the term “agricultural sustainability” has a number of related meanings and achieving them faces associated challenges<sup>2</sup>. A common thread linking the

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<sup>2</sup> According to the website of the European Commission “Sustainable agriculture in Europe is out means of ensuring that future generations can enjoy the benefits of Europe’s unique environmental heritage and natural resources, as we do today. Achieving sustainability, however, means meeting three challenges – an economic

shades of meaning the relevance of time, in particular to changes in the stock of resources that can be used in the production of market output and that, simultaneously, provide the basis for environmental and other non-market output. Consequently, sustainability can be viewed from a number of perspectives – environmental, economic, social, administrative, political etc.

This paper is concerned with a subset of economic meanings. First there is the *structural sustainability* - ability of the present structure of the industry to continue in its present form within the economic and policy environment in which it finds itself. This might be termed *structural static sustainability* and reflects the present ability of firms to compete. When agricultural policy is reformed, the economic environment changes, and this has as implications for structural sustainability. If the present structure of the agricultural industry brings particular benefits – as is often assumed in many EU Member States where the family farm dominates in terms of numbers of units – then policy reform that threatens the survival of such farms is of substantial political importance. Though the composition of agriculture in some of the new Member States is very different, in principle the same argument for sustainable structures applies, though from a different starting point.

However, as will become clear, any given structure is only compatible with a static environment. In the real world, where markets signal the impact of technological advance and of historical events, the notion of sustainability has to include the ability of structures to adapt to remain competitive. A key issue is whether policy reform and EU enlargement enhances or constrains the ability of the agricultural industry to adjust to changing economic and technical conditions – something that might be termed *structural dynamic sustainability*. Of course, both aspects of sustainability will show wide geographical variation, and a marked distinction may arise between those countries and regions with agricultural structure that are dominated by family farms and those where there is a legacy of large-scale agricultural units (mainly the new EU Member States)..

Second, running parallel to structural sustainability is the concept of *policy sustainability*, which can be described that is the ability of the existing array of policy interventions to continue. Even within this context there are shades of meaning. One usage is where the policy initiates a response that continues after the instrument is withdrawn, such as may happen when an investment grant stimulus farm productivity in a way that raises income and leads to higher levels of saving and investment without the need for further assistance. Another usage, more relevant in the present context, is where the cost of the instrument changes, an unsustainable policy being one where the costs escalate to the extent that they present budgetary difficulty or are no longer considered commensurate with the benefits created or are in other ways no longer acceptable (such as being raised to political prominence).

Both structural sustainability and policy sustainability are likely to be affected by the recent changes to the EU's Common Agricultural Policy (CAP), as manifest in the 2003 “mid-term review” of the reformed policy put in place by Agenda 2000. This *inter alia* further reduced market intervention, consolidated direct payments linked to production or resource use into a single farm payment that is to be linked by cross-compliance with environmental, animal

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challenge (by strengthening the viability and competitiveness of the agricultural sector; - a social challenge (by improving living conditions and economic opportunities in rural areas; - and an ecological challenge (by promoting good environmental practices as well as the provision of services linked to the maintenance of habitats, biodiversity and landscape.’

welfare, food and other standards, and continued to increase the emphasis given to the rural development “second pillar” of the CAP, including the use of modulation of the SFP to increase available funds. However, the CAP is only one type of policy that impacts on the industry. For example, in addition there will be national policies on issues such as land ownership, land use and development planning, the taxation of property and of its transfer by sale, gift or inheritance (especially as this relates to the intergenerational transfers of agricultural land) that may be important to shaping structural change.

This paper intends to, first, draw attention to some key issues that are overlooked when policy reform and sustainability are discussed and, second, to highlight areas where there is a distinct lack of scientific research, in the hope of stimulating activities to fill the gaps.

## **2 Do we need to be concerned with the structure of agriculture and what policy reform may do to it?**

Any impact of policy reform on structural sustainability of agriculture must be put in the context of, first, the continuing adjustment that has characterised European agriculture for more than a century and, second, the nature of the institutional units found in this industry. Farms in Europe are relatively small compared to the standards of North America and Oceania, with over half the total number of European Union (EU15) holdings (55%) being less than 5 hectares, although there is great diversity in sizes both within and between countries. Nevertheless the agricultural sector in the EU15 has undergone major structural change since the beginning of the 20<sup>th</sup> century, even in Member States such as the United Kingdom (UK) with its relatively large farms. Structural change has been manifest in official statistics principally as a fall in the numbers of farms in the smaller size classes and a rise in the numbers in larger size classes (though, in some countries, there have also been increases among the very smallest as land transfers to existing larger farms leave a residue of farm dwellings with associated small areas of land that are, in effect, domestic housing).

The structure of agriculture can affect levels of output and the efficiency of resource use, including the intensity with which land is farmed. These issues are of particular concern in times of output scarcity, where the release of resources to other industries is seen as important, and when international competitiveness rises in political awareness. There is also a strong link between structure and the “income problem” of agriculture, the distribution of producing units by size having great relevance to proportion of farms generating only low incomes (from farming)<sup>3</sup> and the transfer efficiency of support intended to assist them. Anything that causes structure to change will impinge on these characteristics.

But of particular significance in the present context is that EU farming is recognised as not only producing agricultural commodities (food and fibre) but also as the generator of environmental, social and cultural services important to the welfare of society (the so-called *multifunctionality* of the *European model* of agriculture). There is a strand of opinion that believes that the present structure of the industry, dominated in EU15 by family farms, is better placed to provide beneficial externalities and public goods associated with agriculture than other types of farm business. There seems to be a lack of convincing evidence of this and the increased political attention given to non-market outputs since the later 1990s may at least in part be explained by rent-seeking behaviour and the protection of existing patterns of

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<sup>3</sup> Analysis of FADN/RICA results shows that smaller farms not only have lower absolute incomes but also lower incomes per labour unit. See, for example, Hill and Brookes (1993)

support. The family farm is a notoriously imprecise concept (see Hill 1993) and often confuses size of business, size of landholding, family labour input and pattern of business control and ownership, including inter-generational continuity.

There is a lack of clarity in distinguishing between environmental and socio-cultural impacts and in identifying the nature of the causal relationships between structural characteristics and these impacts. For example, a relationship may be hypothesised between, on the one hand, family farming and, on the other, environmental benefits. But is the critical factor the farming system employed, the size of the farm in terms of area (which may in part determine the farming system), or whether it is family operated? Turning to arguments that focus on farming's contribution to rural society through generating jobs, income, social interaction and cohesion, is the crucial factor the size of the farms, the number of people working in the farm business or the size and incomes of people living in the farm dwelling? If it is number of people employed and living on the farm, does it matter if they are engaged in farming, or in diversified activities on the farm, or gaining their income from off-farm activities? A case might be made that policies to support the present family farm structure are required on social grounds, and monetary values might be attached to the benefits so that they can be compared with the costs of such a policy. However, it is by no means certain that the same agricultural structure that provides social externalities to an optimum level is needed to generate environmental benefits to the economic optimum. It could be that land management could be more efficiently operated with far fewer and thus larger farm businesses which could, at the same time, generate satisfactory incomes for their operators.

### **3 Does policy reform impact on structure?**

Policy reform is only one of a number of influences on structure. The pressures that cause adjustment at the farm level are not always steady, nor is response gradual. History suggests that, in addition to the longer-term cost/price squeeze and downward pressure on incomes, sudden shocks can occur, whose effects are superimposed that demand rapid adaptation. Such shocks may be created by technical step-changes (as happened in Europe following the opening up of transportation systems that produced stiff international competition in the 19<sup>th</sup> century and the mechanisation of United States of America (US) agriculture in the early 20<sup>th</sup>) or economic crises (such as the depression of UK farm profitability in at the start of the 21<sup>st</sup> century resulting, in large part, from the strength of Sterling)(Defra 2004). Reform to the EU's Common Agricultural Policy (CAP) tends to take the form of marked changes needed to meet some financial or organisational hiatus, separated by periods of stability, rather than one of gradual evolution. Since the 1990s there have been a number of these policy shocks. Future adjustments to the CAP are likely to follow the pattern set by the 1992 MacSharry reforms, Agenda 2000 and the mid-term review of 2003. .

The CAP has primarily been a policy that attempted to defend agriculture against the inevitable economic forces brought into play by the Treadmill of Technological advance. The market intervention system by increasing the prices received by farmers above what they might otherwise have been probably reduced the pressure on incomes, but restructuring has continued. The switch to forms of direct payments and more recently the Single Farm Payment (SFP) similarly has not apparently greatly altered the direction of change. However, there is some evidence (from the US) that as farmers become more aware of the reduced marginal value product of using their resources in agricultural production (in particular their labour) resulting from lower product prices there will be an accelerated shift of resources to other uses.

One likely result of the history of reforms being made in response to crises is that the stance of policies within the CAP (and in national policies) to assist adjustment has also been rather defensive. The main policy response to reforming commodity regimes has been the introduction or enlargement of other, more direct ways of supporting the incomes of agricultural producers. The overarching (if unrealistic) structural objective has been to protect the number of farm units in the sector and to keep their family-operated character. However at the same time, and in partial conflict, featured prominently among stated policy objectives is the intent to create or maintain a viable, competitive farming sector, capable of providing “reasonable” or “fair” standards of living. The first objective has led, in many instances, to a complex set of measures that tries to manage the transfer of land, the size of farms, and the way in which farm businesses are organised. The second objective (in addition to market support policies and direct payments) is pursued through investment measures (incentives for modernisation, diversification, afforestation etc.) and through training, the latter generally directed at improving technical and business performance within the sector but also embracing the development of skills useful to non-agricultural activities. Clearly, the creation of viable farming units involves decisions about how resources no longer needed in farming (mainly labour) may find alternative uses where retirement is not appropriate, and thus general rural development policies are increasingly finding a role in agricultural adjustment strategies. It is hoped that these will provide farmers and members of their families with economic opportunities that may enable them to continue to live in their local areas, often on their farms which become, in essence, residential units or operated on a part-time basis.

The ambiguity of structural aims is expressed eloquently by Daucé *et al.* (1999) in the introduction to an article analysing early retirement programmes for farmers in France.

“Concerning employment, structural policy in agriculture has always been split between two contradictory objectives; on the one hand policy aims to bring about the modernisation of agricultural holdings through investment subsidies, hence the substitution of labour by capital, but on the other hand, and sometimes contemporaneously, measures are taken to prevent the emergence of strong demographic imbalances in rural areas, incentives are put in place to encourage the installation of young farmers” (translation by Cahill).

It is worth noting the broader consequences of adjustment in agriculture on the sustainability of rural areas. The proportion of the active population that is wholly or mainly engaged in agriculture is small, even in most predominantly rural regions in industrialised countries. In many such regions there are more self-employed people operating other types of businesses than there are farmers. The share of rural economic activity generated by farm household-firms is likely to be similarly small. Consequently the economic impact of adjustment by farm household-firms on the broader rural economy is likely to be modest though, as the major land-user, consequential environmental changes may be far more important from a societal perspective. Similarly, the claim is sometimes made that the quality of rural society is disproportionately dependent on the presence of a sufficient number of farm families to act as instigators of local social, political and cultural activities, without which the fabric of the community would soon disintegrate (Agra CEAS 2003). In the reverse direction, the operators of agricultural household-firms will be affected by policies aimed at rural areas and regions designed, for example, to maintain populations, to support services, or to stimulate businesses, jobs and incomes there. The creation of alternative jobs in rural areas for farmers and their families is an explicit aim of the CAP’s “second pillar” and farm

households will share benefits brought to regions lagging behind, which are often rural in nature.

#### **4 The adjustment process in agriculture – the centrality of the household-firm**

While farm adjustment is most often described in terms of numbers of farms and size characteristics, it can take many other forms. In considering structural change it is important to understand the behaviour of the basic economic units engaged in farming. While a range of institutional types exist at the farm level, in the EU the majority are family-owned businesses<sup>4</sup>. Sometimes these adopt corporate form for taxation or inheritance reasons but such units can be treated, for most purposes, as if they were unincorporated. The predominant model to use when considering adjustment and the role of adjustment policy is thus that of the household-firm. This is a hybrid that combines the economic functions of production and consumption. These functions are not easily separated, for example when houses and vehicles are used for both and where there is a blurring of work-time and leisure. The consumption of own-produced goods presents a particular problem of identification and measurement.

But households in agriculture do more than produce; they are often owners of the assets of the business, often including land. Though not reflected in conventional income measures used to monitor the industry for policy purposes, real capital gains constitute a form of income that has been influential in retaining farmers in agriculture even when current rewards have been low. Capital losses may shift the equity leverage and require changes in holdings, including sales of farmland. Large net worths imply high economic status and an ability to ignore income pressures, at least for a time, and to use land in ways that reflect personal preference (such as low-intensity farming systems that may bring environmental benefits). Thus a satisfactory explanation of the adjustment process in agriculture needs to take a broad view of the activities of the complete farm-household economic unit, not just its farming component, and to cover both income and capital.

Household-firms are also social units and their responses to economic signals are influenced by such factors as the life-cycle of farm operators and the value sets of farm households within the broader context of rural society. Land changes hands rather infrequently and now mainly through transfer or inheritance within families; in most European countries the majority of land is owned by the families that farm it. Only a relatively small share of farmland becomes available on the open market, the main purchasers tending to be existing farmers enlarging their holdings. Significant adjustment often occurs at the point at which one generation takes over from another; it appears to be far less common within a farming career. Such adjustment may include rebalancing enterprise mix, on-farm investment, changes in area and land use with possible environmental implications, and wide-ranging decisions, such as whether the new operator should be full-time, part-time or leave farming altogether. Indeed, probably the most critical decisions that impact on structural change are those about retirement and non-entry by a successor<sup>5</sup>.

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<sup>4</sup> According to the EU Survey of the Structure of Agricultural Holdings (Farm Structure Survey) “Natural persons” accounted for 98.8% of EUR 12 holdings in 1993. Only one country was below 97% - the UK at 93.7%.

<sup>5</sup> For a review of the restructuring process in England, including an identification of factors which drive it and those that hinder it, see University of Plymouth (2002).

#### 4.1 Adjustment to policy signals

Most households that operate farms are not exclusively involved in agricultural activity. For a large and increasing proportion, farming is only one of their gainful activities. The presence of these other activities is a major factor that explains the ability of many farms to survive as independent units, especially among the smaller ones where agriculture alone could not generate an income adequate for the living of its occupying family. Farm facing the most severe income pressures tend not to be the smallest nor the largest (in area or business size terms) but those intermediate ones that are too small to generate a satisfactory income from farming alone but too large to be operated as a part-time unit.

Multiple income sources also have implications for the impact of agricultural policy reform on livelihoods and on adjustment behaviour. Where agriculture is a minor activity, reforms in agricultural policy are likely to have a minor effect on household well-being and thus on the ability of the farm to survive. Such households are more likely to be influenced by developments in the rest of the economy, so that changes in their agricultural activities will largely reflect non-agricultural factors (such as what is happening to their other sources of income). The proportion of farm operator household income derived from non-farm activities has been rising steadily in industrial countries, and now constitutes the principal source of farm household income in many cases (Hill 2000). The proportion of household-firms for which farming is the sole source of income is small. However, it does not necessarily follow that those heavily dependent on farming are all large units or account for the great majority of output. Thus an important piece of information when assessing the impact of agricultural policy reform is the socio-economic structure of household-firms that comprise the farming industry.

Analysis of farmer behaviour in the USA and Canada (Hopkins *et al.* 2004) demonstrates that responses at farm level to policy signals and economic shocks is highly varied. What happens at the farm level reflects both the willingness to adjust and constraints on the ability to change, including access to capital and management experience. Economic theory, backed up by experience with farm management in the EU, leads one to expect that in the short and medium term farm operators routinely adapt their production practices in response to changing prices, both for those of agricultural commodities and (increasingly) the other goods and services that many produce. At sector level, because of the expansion of multiple income sources that characterises agricultural households, the relative impact of a reduction in their returns from farming is less important for them now than in the past, though in EU Member States some pluriactivity has always been in evidence. But the heterogeneous nature of farm operators implies a wide range of responses that reflect *inter alia* differing orientations towards farming, levels of dependency on farming for a livelihood, attitude to risk, and age and stage in lifecycle. A useful typology, developed in the US and Canada but also found to be applicable in Italy, is to group farms into limited resource (very small), retirement (small farms where the operator is retired), residence/lifestyle (small farms where the operator's main occupation is outside farming), family/commercial of various sizes (where farming is the operator's main occupation), and non-family farms (ERS 2000).

The impact of the removal of support would be greatest (in an absolute sense) for large farmers (measured by the value of sales), but such farmers tend to have above-average incomes in comparison to other households in industrial countries. In the longer term, given the historical tendency for agricultural prices to decline in real terms, farmers have adopted

various strategies to try to protect their economic position. Some have chosen to increase the scale of their operations, typically by purchasing or renting land, in order to generate larger total revenues and net income from agricultural activities. Some have opted to intensify production and generate a higher output value from the same land base. As noted above, many farmers, or members of farm households, have chosen to allocate a larger proportion of their labour and capital to activities (either on or off the farm) that are not strictly agricultural (in terms of the international standard classifications of products). This has led to a sustained out-migration of labour from agriculture and a decline in the total number of farmers, in particular those who are devoted full-time to agricultural activities.

Evidence from the US, Canada and the EU suggests that much of the overall sectoral adjustment is achieved through exit and entry within the sector. Adjustment by existing operators within their careers is relatively muted. Work with successive Censuses of Agriculture has demonstrated that structural change is associated with a difference between the numbers of (mostly elderly) operators leaving agriculture and the smaller numbers entering (Gale 2003). The rate of exit seems to be relatively little affected by what the current economic state of farming. This also applies to the numbers of young entrants (presumably mainly comprising family members taking over responsibility for management). However, the numbers of relatively mature entrants (aged 35 years and over) was much more sensitive to economic circumstances; often these will be people who are already established in careers outside agriculture. In the UK it has long been found that part-timers feature strongly among new entrants to farming, in the sense that they have another source of income, frequently as self-employed operators of other businesses or professionals (for example, Harrison 1975). These do not necessarily account for most of the land that changes hands, as where land is released for sale by an exiting farmer it appears that most is bought by existing large and medium farmers who wish to expand their areas.

If these findings apply in the EU, as seems likely, this points to the need for any consideration of responses to policy reform to focus on entry, exit, and inheritance. All three will be affected by the capital aspects of agriculture, including the need to acquire access to capital for entry, the way that capital is taxed, annually and when transferred by sale, gift or inheritance. In the US there is a clear link between land prices and agricultural policies, support being capitalised. One of the effects of removing existing agricultural policies is that market values of owned factors of production are likely to drop. In the US, where the link between the profitability of farming and land prices are seen as direct, this can affect structural change; asset deflation hurts owners of assets, but may help those who lease or would like to own assets. “Adjustment to asset deflation may be especially difficult for those who have financed their purchase of that asset, meaning that adjustment pressures will affect the borrower as well as the lender” (Hopkins *et al*, 2004). In the EU, where there are often additional factors determining the price of land, the impact of policy reform on assets values may be more muted.

## **5 Policies to maintain structural sustainability**

Despite the inevitability of adjustment in the face of the longer-term cost-price squeeze, the CAP has acted primarily as a defensive mechanism against pressure for adjustment, thereby hampering structural sustainability in both its static and dynamic manifestation. Income support has not only been the main policy aim behind commodity regimes and associated direct payments, but additional support in the form of cushioning has been the principle

response to shocks. Despite these efforts to prop up incomes, structural change has been substantial and continues.

There may be sound reasons linked to agricultural sustainability why some changes should be curbed, particularly where these are believed to carry environmental implications; support to farming in hill areas is justified on environmental and social grounds, though it is at least debatable whether income support to the farmers there is the most suitable way of achieving these aims. A case can be made that, in some situations, market failure justifies intervention to assist the adjustment process, in particular by countering asset fixity. There may be an element of striving for equity, in that the pressures to adjust may be most keenly felt by low income/low wealth farmers who are mainly dependent on farming, and assistance can be steered towards them. Part of the motive may be to compensate farmers for past government failure, in that the existing structure may reflect expectations by farmers built up through past government policy assurances of support for agriculture for which there is no longer the will to deliver. However, history also suggests that the introduction of structural policies, or their greater emphasis, is often a political ploy to enable reform to take place elsewhere in the support system where costs are becoming unmanageable or are an impediment to strategic aims (such as reaching trade agreements).

Whatever their rationale and motivation, in the EU programmes to assist structural adjustment absorb only very a minor part of the agricultural budget; they have usually accounted for less than 10 percent of total CAP spending. Identifying and measuring the full extent of public assistance to adjustment in the EU is complicated because of the complex way in which rural development spending is financed from Community funds, the involvement of national spending in various proportions, and the existence of national policy measures.

### **5.1 Structural adjustment assistance within EU agricultural and rural policy**

Attempts to assist adjustment and thus make agriculture more sustainable have long policy roots, with many national schemes pre-dating EU policy<sup>6</sup>. Mansholt in 1968 identified the unsustainability of European agriculture's structure of the time and the need for major adjustment, but action to achieve the proposed changes was then judged to be politically unacceptable. Subsequent EC Directives in 1972 represented a much watered-down policy response in the form of support for investments for farm modernization (capital grants or subsidized interest rates), financial incentives for retirement and land reallocation, and the provision of socio-economic advice to farmers.<sup>7</sup> The passage of time saw this list expand to include schemes to assist the entry of young farmers (financial assistance), to provide vocational training for hired workers and self-employed farmers (mainly in the form of financial assistance to organizations providing the training), to improve processing and marketing of agricultural commodities (grants to the firms involved, mainly not individual farmers), to encourage diversification on farms (including into organic production and non-

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<sup>6</sup> For example, in the United Kingdom the 1957 Agriculture Act contained provisions, based on the Swedish model, to assist with farm amalgamations (with a negligible uptake) and investment grants for modernization of viable units (much larger uptake). In 1959 the United Kingdom introduced a scheme to assist small farms to develop their businesses, but did almost nothing for the low income, poor management group. The 1967 Agriculture Act raised incentives for amalgamation and provided an Outgoers Scheme (pension or lump sum) and envisaged grants for encouraging tourism and recreation on farms. National schemes were mostly replaced by European Economic Community (later European Union - EU) schemes upon accession

<sup>7</sup> Directive 72/159/EEC Modernisation of Farms; Directive 72/160/EEC Cessation of farming and the reallocation of agricultural land for structural improvement; Directive 72/161/EEC Provision of socio-economic guidance.

food crops by financial incentives that include capital grants and compensation for income forgone), and for the afforestation of agricultural land (various grants for planting and to offset income forgone in the establishment phase). There were also efforts to create alternative job opportunities in rural areas<sup>8</sup>.

Of the subsequent attempts at reform, the most significant in terms of agricultural policy were those of 1992 ( “MacSharry”) that lowered support prices by a hitherto-unprecedented extent; actions linked with the need to make progress in the Uruguay round of trade negotiations under the General Agreement on Tariffs and Trade (GATT). “Compensation payments” were provided. These were necessary to make the policy reforms politically acceptable and to cushion their short-term impact on incomes; there was deliberate ambiguity concerning how long these payments were to continue. At the same time “accompanying measures” were introduced to facilitate structural adaptation, mostly continuing and expanding the types of schemes already in place.

The *Agenda 2000* package, that *inter alia* carried the MacSharry reforms a stage further and paved the way for EU enlargement, defined rural development as the CAP’s “Second Pillar” (price and income support being the first). In practice, the provisions for farm adaptation were contained in the Rural Development Regulation (RDR) 1257/1999; this brought together into a single piece of legislation the “accompanying measures” and other structural schemes, including the encouragement of conversion to organic production (again developed from an existing measure) and some new provisions. The Chapters of this Regulation are listed in Annex 1. Within its framework, national governments produced plans (covering 2000-06) for local implementation (in the United Kingdom there are separate ones for England, Wales, Scotland and Northern Ireland) which, when agreed with the Commission, are part-financed through EU funds. Typically, existing schemes have been rapidly adapted to fit the RDR 1257/1999 requirements, though some new ones have been introduced<sup>9</sup>.

Have the adjustment measures been effective? In the EU there is a requirement that evaluation be carried out on schemes aided by EU funds, and in the UK there is also pressure to carry out national studies. In consequence there is an accumulating body of evaluation evidence at Member State and EU levels of various schemes to assist structural adjustment, including the mid-term evaluation of the Rural Development Programmes and the structural assistance schemes they contain. There is only space here to provide a few observations drawn from this information. It must be conceded at the outset that evidence on the performance of adjustment policies is not particularly strong, but what exists tends to point to results that are, at best, mixed and dependent on the context and manner of the application of instruments.

**5.1.1 Early retirement and installation of new entrants.** Early retirement schemes, perhaps the intuitively most appealing form of structural assistance, are problematical<sup>10</sup>. Aid to early retirement (and to assisting new entrants) has not been offered in England and Wales in the present RDP because of a history of lack of success, *ex ante* appraisals that suggested low additionality and high deadweight (the expectation being that much spending would be absorbed by people who would have retired anyway) and some concern over the equity of treating farmers as a special case in rural areas. A review of such schemes across OECD

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<sup>8</sup> For a review of EU policy on agricultural structures see Commission (1985, 1990).

<sup>9</sup> For a review of the way in which the RDR 1257/1999 has been implemented, see LUPG (2002)

<sup>10</sup> Under the EU RDR’s chapter for assistance to farm outgoes, hired workers are eligible for some income support as well as vocational training.

members noted that participation had been relatively weak in most countries (OECD 1995). Where uptake was greatest (Sweden and Finland) the measures were quite closely targeted and rather generous in terms of the incentives offered. In contrast, France for many years has implemented enthusiastically programmes favouring the installation of young farmers and the early retirement of older farmers, often in parallel. These linked actions are operated with structural adjustment rather than social objectives in mind. The general conclusion in the literature (see for example Daucé *et al.* 1999) is that there has probably not been a significant net increase in the number of young farmers entering the sector; rather they have taken over from older generations of their families earlier than would otherwise have been the case. In any event, a policy that aims to take labour out of the system with one set of measures and re-insert it with another, is inherently paradoxical.

Like France, Ireland implements installation and retirement policies vigorously with a view to improving farm structures and maintaining viable population levels in rural areas. These include, under EU early retirement provisions, a pension granted for up to ten years on transfer of the farm through lease, gift or sale. Rental income in these circumstances is exempt from income tax and there is retirement relief on capital gains tax of up to 476 250 Euros. For new entrants there is an installation allowance and priority access to quotas. The demographic structure of the sector has been improving in the past decade, although whether this is due to the various measures in place, demographic change or overall macroeconomic developments is difficult to say.

**5.1.2 Investments.** Evidence from across the European Union on assistance to farm investments that formed part of a previous regulation (EC 950/97) suggests that such schemes were of greatest benefit to countries that typically had farms of small size but were least relevant to countries, such as the United Kingdom, which already had a better farm structure (Agra CEAS 2003b). However, the conclusion on the performance of the UK's various schemes operating during the 1990s suggested that they delivered value for money, with smaller projects likely to display greater additionality (studies quoted in CRER *et al.* 2002).

**5.1.3 Training.** There is evidence from the United Kingdom that higher levels of vocational training are associated with greater on-farm innovation and more technology transfer (Gasson and Hill 1996) but, perhaps surprisingly, there seems to be no evidence of a relationship with business performance. Training appears to concentrate on what is needed within the agricultural industry rather than to encourage adaptation and diversification. Germany is one of the few European countries that has implemented specific assistance through training for farmers to leave the sector for employment elsewhere.

It is too early to judge the performance of farm adjustment schemes introduced under the RDR 1257/1999 for the European Union as a whole. Findings for Wales (Agra CEAS 2003a) and England (ADAS and SQW 2003) are to hand, but the disruption caused by Foot and Mouth Disease in 2001 has contributed to slow uptake, with actual spending falling behind the amounts budgeted. Administrative costs appear to be high. Anecdotal evidence suggests that the presence of change agents (such as agricultural officers in National Parks) can be influential in take-up. Though income gains for participating farms can be detected, assessing the impacts on the agricultural industry as a whole must wait for more projects to

be completed. However, the relatively small numbers of direct beneficiaries suggests that this is likely to be muted.<sup>11</sup>

#### **5.1.4 Instruments that support economically unsustainable farming**

It should be noted that EU spending under RDRs includes much more than provision for adjustment at the farm level. Most significant is the spending on agri-environment schemes and support for farming in mountainous and other less-favoured areas. These took about 40% of planned spending under the RDR in the EU15 in the period 2000-06, but two-thirds in the United Kingdom and more than half in Austria, Sweden, Finland and Ireland (LUPG 2002). In the short term these agri-environmental payments may be seen as assistance for adjustment to policy reform. But in the longer term, if environmental objectives can be achieved more cost-effectively with fewer but larger farms, it would be expected that incentives will eventually be reduced and structural change ensue. The special payments to farmers in hill areas are, if anything, incentives *not* to adjust to prevailing market conditions. Again, there may be social or environmental policy objectives that justify the continuation of farming in these areas, though alternative approaches to achieving such ends may be preferable.

#### **5.2 National and other policies attempting to secure a sustainable structure**

Within the EU the picture of assistance to achieve a structurally sustainable agriculture under national policies is complex and not well documented. However, information for a few countries and for a few types of assistance enables some observations to be made. A range of agricultural and land use programmes exist outside the CAP framework that influence farm household-firm adjustments, such as legislation that regulates the relationship between tenant and landlord and the explicit controls that some countries exert over the purchase and sale of land. Farm operators are also subject to national economic and social policies that may have particular relevance to adjustment, such as education (in that this affects occupational or locational mobility) and infrastructure, including access to electronic communication.

Some forms of general assistance to mobility may not be targeted specifically at farmers but are of disproportionate importance to them. For example, in the UK capital gains tax concession are available to self-employed businessmen who retire, and these are of importance to farmers because of the large gains many will have accumulated. Or general systems may exist within which farmers are given preferential treatment. A review of taxation found that special concessions for agriculture in income taxation and annual property taxes were common in OECD countries, as was the favourable treatment of agricultural land in inheritance taxes (by using a less-than-market value, or lower rates of tax, or other allowances) (Anderson *et al.* 2002). Social contributions for farmers may be lower than for other socio-professional groups. Some of these concessions might be inhibitors of adjustment, providing incentives for remaining in agriculture whereas others (such as inheritance concessions for early transfer of land) might encourage change.

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<sup>11</sup> For example, in Wales, where there are some 13,000 agricultural holdings above 8 European Size Units, the numbers that had approved projects under the Farm Improvement Grant, Farm Enterprise Grant and the Processing and Marketing Small Grant schemes by mid-2003 totalled less than 300. In England, with some 115,000 holdings above 8 ESUs, the target number of projects to be assisted by the Rural Enterprise Scheme by 2006 was 500. For the Processing and Marketing Grant (which would include other eligible businesses) the target was 370.

Social benefits are also potentially important to structural change, in particular retirement pensions. Though the funding of pensions may differ between farmers and other groups, the essential point is whether there is an incentive for certain groups to accept a pension and thus become less dependent on the farm (which might facilitate policy reform). In Germany between 1965 and 1983 structurally-improving transfers of land were rewarded with a higher pension, presumably encouraging retirement. However, in Ireland the system of poverty alleviation contained benefits that were specifically targeted at farm families and general ones that *de facto* offered preferential treatment for them, which would be expected to provide an incentive for not leaving.

Of particular interest are the policies that some countries apply to land transfers (OECD 1998). The present structure of agriculture will reflect *inter alia* the past legislation on inheritance. In that intergenerational transfers are known to be crucial nodes for structural adjustment, inheritance laws form a background against which policies to assist adjustment have to work. But of at least equal importance are the interventions that governments in some countries make in the operation of land markets, ostensibly to create agricultural structures more in line with social, economic and environmental objectives but in practice probably impeding adjustment. While at one extreme the UK and Ireland do not have any significant intervention mechanisms, two important EU examples (France and Germany) can be given where this takes place, with Norway providing another (see Annex 2, from Hill and Cahill 2004).

## **6 Sustainable policies**

As noted at the outset, a policy can be considered sustainable if it achieves a result such that, when the instrument is withdrawn, the effect continues without the need for further interventions. Thus the instrument becomes redundant and can be phased out. Another and related approach to policy sustainability is the absence of rising costs (or other characteristics) that at some stage result in it reaching resource limits that force the policy's termination or succession. Thus instruments that impose continuing burdens that do not run into resource constraints may be regarded as sustainable, even if their results are dependent on a continuing stream of interventions. Of course, policies that are sustainable in the first sense are highly likely to be sustainable in the second. In this final section, consideration is given to these aspects of policies to achieve a sustainable agriculture. It is helpful to think of policy interventions designed to achieve agricultural sustainability as falling into these two main types.

First there are the policies that aim to make the agricultural sector more competitive and more responsive to price signals, allowing it to embark on a series of adjustments that reflect changing technological and market conditions and the shocks arising from policy reform. These clearly have the potential for being sustainable. Thus the investment in human capital can achieve a workforce that can operate competitively and can adjust their business (sizes, range of activities etc.) in a flexible way. Where this is not possible, a decision may be made to withdraw from farming completely. Anything that lowers transactions costs in the system of land or factor markets is likely to have similar benefits, such as encouraging land mobility by freeing up the land market. Removing impediments by assisting the exit of a generation of holders who are forming a block on adjustment, can achieve permanent and lasting benefits. The provision of communications infrastructure forms another example. Much depends on whether the underlying problem is one-off or endemic. A danger is that what is

intended to be a one-off kick-start to a self-sustaining process can easily turn into a repeated and costly form of support.

Second, there are those policy interventions that are designed to prevent structural change, which have the potential of being non-sustainable. Most notable are the payments to farmers in Less Favoured Areas. In the EU, under the RDR though the ultimate objectives are environmental and social, the sums paid are intended to compensate farmers for the natural handicaps they face, thereby supporting their incomes and thus providing them with an economic incentive to stay farming. The rationale behind the level of payments is such that, with falling commodity prices, these should be reduced. However, the pressure on incomes is not a reflection of this compensation for costs. If the numbers of farm families is to be maintained, the payments per farmer are likely to rise with time as the incomes they might earn elsewhere and in other occupations grow and hence their total budgetary cost will increase. Such rises are likely to face budgetary constraints, though society may be persuaded to increase the resources available. With restraints in place the policy will become unsustainable unless the numbers of benefiting farm households can be reduced. Thus it seems inevitable that a degree of structural change is inevitable, with farm amalgamation (operation if not also ownership) and, where possible, diversification.

## **7 Discussion and conclusions**

The economic aspect of agricultural sustainability implies farm businesses that are viable. A structurally sustainable agriculture means that it is currently competitive and is capable of adapting to changes in the economic and policy environment. In Europe the main emphasis of agricultural policy has been to defend farmers against the pressures that would lead to structural adjustment. Where shocks resulting from changes in policy have been anticipated, the main response has been to provide a further cushion of income support. Overall, there is relatively little in current EU agricultural policies that is actually designed to facilitate the adjustment process in agriculture. The consequence is that most of the structural responses to longer-term pressures for change have taken place without much assistance from policymakers. Such adjustment measures that have existed have been primarily sectoral in nature and have only been used by a minority of farmers.

The most obvious way of attaining a sustainable agricultural structure is to assist labour currently used inefficiently to leave the industry. However, EU Member States do not seem to pursue vigorous positive adjustment measures by retraining labour for another occupation. While there are local training efforts for farm-related diversification, such as for green tourism, their purpose relates more to keeping labour on farms, albeit with a diversified activity set. Measures focussing on entry and exit operate under the assumption that it is better to get older farmers out of the sector and younger farmers in, although there is little evidence to suggest that such measures do anything but accelerate a process of transfer of farm management within families that would in any event occur, while generating significant additional transfers from taxpayers and consumers. Few seem to welcome entrants to farming from non-farming backgrounds — which may also constitute a missed opportunity in rural development terms.

A number of measures can be found outside the framework of the CAP and EU-level policies that, by design or otherwise, influence decisions to make adjustments, including those concerning entry to and exit from the agricultural sector. These include policies regulating farmland mobility/transfer, social security policies with the emphasis on

retirement pensions, taxation with the emphasis on property, inheritance and capital gains taxes, and some aspects of income tax law. Remarkably little research has been found that evaluates the effects of these measures, either individually or as a whole, on the structural sustainability of agriculture. At least some of them impede structural adjustment. Where policy reform requires adjustment yet national measures constrain the ability of producers to adjust, it seems likely that there will be increasing pressure to provide income support to bridge that gap, the costs of which are likely to become unsustainable.

Many if not most European countries avow an attachment to family farming and relate that to avoiding rural depopulation. The United Kingdom is the only real exception, though this owes something to the rather different concept of what family farming constitutes there and the recognition that rural development in Britain is not dependent on agriculture to the same extent as is assumed in some other European countries. In reality, the main link seems to be with size rather than the fact that the family may provide the main (perhaps the only) labour input to the farming process. A substantial strengthening seems to be needed of the evidence base about the links between family farming and the way in which this impacts on the environment and on rural society. This will involve disentangling the way in which farming system alone is associated with environmental benefits from the social ones and environmental ones that may flow from having a relatively large number of small units and a relatively high number of people engaged in agricultural production, even if only on a part-time basis.

Clearly further reform of the CAP will influence the agricultural sector's structure, although precisely how or in what direction is difficult to establish. Nonetheless, it is clear that significant capitalisation of support into land values has occurred. The price of land has been inflated to the point where many governments believe that its market value has little or no relation to its economic value in agriculture<sup>12</sup>. Similarly, measures designed to restrict production in different sectors have created rents (dairy quotas, headage limits for suckler cow premia, etc) that constitute significant entry costs. It is here that one of the most fundamental paradoxes in agricultural policy is to be found. Governments try to offset inflated entry costs, caused, at least to some extent, by mainstream agricultural policies, through a second string of measures that are structural, fiscal and social. Action on both fronts, an unravelling of agricultural specific support and protection on the one hand, and an easing of restrictions on land transfer and in particular on conversion to non-agricultural uses, could have significant beneficial effects in making the structure of agriculture more sustainable and making it more responsive to change. In parallel there could be significant spin-offs in terms of the development of non-agricultural activities in rural areas.

#### **Note**

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<sup>12</sup> It is not only agricultural support that influences land values, pressure from development and urbanisation can also be important in some countries.

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## **ANNEX Examples of countries that intervene in the market for agricultural land with the purpose of achieving structural aims – France, Germany, Norway (from Hill and Cahill 2004)<sup>13</sup>**

**France.** While France does not have general agrarian land legislation to control farmland ownership, or to control changes in farmland operators, in reality regulations and institutions exist that have a significant impact on land operations. In particular, the institutional status given to the SAFER (*Sociétés pour l'aménagement foncier et l'établissement rural*) is important in the French farmland market (SAFER, 2003). These organisations were set up in 1960 as non-profit public corporations owned by the government and controlled by farmers unions, mutual organisations and other administrative or agricultural entities such as agricultural banks. Their principal objectives are to help certain farmers expand farm scale, facilitate settlement or maintenance of viable farm units and thereby improve agricultural structures through buying and selling operations in the farmland market. There are currently 26 SAFERs.

Any landlord (of tenanted land, which accounts for about 2/3 of the total) wishing to sell farmland must inform the relevant SAFER two months in advance. The SAFER may itself purchase the land if it considers that desirable from a structural point of view, pre-empting all other possible buyers, other than the tenant of the land. All land acquired must be resold within a given period either to new farm entrants or to foster sustainable farm units. No specific standards define eligibility to buy land from a SAFER but the underlying aim is to foster an “ideal type” of holding which is defined by the law as “a family farm holding with personal liability”. This notion is based among others on a minimum settlement acreage (or SMI) which differs from region to region. In recent years the powers and mission of the SAFER's have been extended to cover environmental management of land.

SAFERs have been very influential in the French land market in some years in the early 1990s accounting for as much as 25% of all farmland purchases in France. According to the most recent data they purchased 23% of farmland coming on the market. Of those purchases, 85% were amicable in nature and 13% by pre-emption (a form of compulsory purchase). Half of the lands disposed of most recently have gone to “young farmers” with the rest being used to increase existing holdings.

The impact of the SAFER is difficult to gauge. The extent to which they impede or facilitate farm consolidation probably varies from region to region and *département* to *département*, reflecting the local composition of the boards and local conditions and attitudes. Reflecting this, SMIs (minimum settlement areas) seem to be quite different from region to region. For this paper levels ranging from 90 hectares (Ardennes) to 25 hectares (Vienne) to 18 hectares (some parts of the Pas de Calais) have been found. There are also significant differences in the extent to which farms are prevented from becoming bigger. Local authorities seem to also have the power to intervene in land market operations that would result in farms becoming bigger than some multiple of the SMI. Certainly, the institutions and regulations in place are sufficient to allow micro management of land markets but the extent to which they actually do so in practice is difficult to determine. A thorough study of changes in farm structures at disaggregated level would be necessary to come to any conclusion on this point.

**Germany.** Germany maintains statutory controls over any change in ownership or lease of agricultural land. Authorisation for any transfer of farmland rights may be withheld in three cases:

- If the transfer would lead to an undesirable distribution of farmland – *e.g.* transfer to non-farmers is generally considered undesirable.
- If the transfer would lead to undue fragmentation of land (a minimum of 1 hectare) or excessive aggregation (more than around 400-500 hectares, but only in the former Federal Republic).
- If the sale price is thought to be seriously disproportionate to the land's value.

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<sup>13</sup> Hill, B and Cahill, C. (2004).

The same criteria may be applied in the case of farmland leases.

Länder have state-owned organisations (*Siedlungsgesellschaft*) that buy farmland from farmers and non-farmers and resell it to farmers. They may intervene only with respect to land parcels in excess of 2 hectares and when no farmer is in the market for the land in question. Pre-emptive rights may be exerted over non-farmers but not over farmers.

**Norway.** The Concession Act of 1974 aims to protect the limited farm area. To acquire farmland other than through inheritance or other type of transfer within the family requires a concession granted by the king. The acquirer must have a professional agricultural qualification and must live on and manage the farm for five years. The Concession Act also aims to control prices of agricultural land in order to limit the capitalisation of support into land values. The Land Act prevents subdivision of farms without approval of the authority and also lays down conditions for how land should be farmed – in conformity with normal farm management practices. In other words the owner of cultivated land has an obligation to preserve it and to actually use it for farming. If the latter is not observed the state may expropriate the property and transfer it to others. The state has pre-emptive rights over any real estate covered by the Concession Act, including on farms and farmland to be used for structural rationalisation



# **An approach to rural development: participatory and negotiated territorial development (PNTD)**

Rural Development Division of the Food and Agriculture Organization (FAO)  
SDA Working Group<sup>1</sup>

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## **1 Introduction**

The emergence of territoriality (in this text we will employ the ILO definition of “territories which cover the total environment of the area which the peoples concerned occupy or otherwise use”<sup>2</sup>) in the current discussion on rural development is not fortuitous. It is the product of economic and social changes within countries and in the wider political context of globalization. It responds to the need to adapt methodologies, instruments and activities to the new requirements imposed by these changes and their undesired impacts. Finally, it promotes a different image of territorial issues and directly involves rural populations in the design of new development perspectives.

Actors define the territories they live in or interact with. The actors’ territoriality, or territorial vision, helps to establish a common identity and supports the realization of actors’ strategies and projects. In addition, a plurality of actors with different and sometimes conflicting interests and values influence the dynamics and interrelationships within the same space.

The approach proposed here takes up these preoccupations and aims at linking the work done in this regard within the FAO Rural Development Division (SDA). Both Services of the Division, the Land Tenure Service (SDAA) and the Rural Institutions and Participation Service (SDAR), have worked on complementary aspects of a territorial approach for the development of rural areas.

In recent years, a number of SDAA and SDAR officers have analyzed the existing relationships between local actors and their territories and the implications of those relationships for local development. The output of this first effort to conceptually frame the idea of territorial development resulted in the “Methodological orientations for a participatory and negotiated territorial approach”. These reflections focus mainly on the territorial

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<sup>1</sup> This text was written for the Rural Development Division (SDA) under the supervision of SDA officers Jean Bonnal and Paolo Groppo. The team was composed by Sylvia Clementi, Stephan Dohrn, Federica Ravera, and Catia Santonico Ferrer. We would especially like to thank Ilaria Leonardi for her help in conducting the interviews and the valuable contributions she provided during the drafting of this article, and Michaël Reyburn for reviewing the language.

<sup>2</sup> ILO convention 169, Art. 13 (2).

diagnostic process as a means to promote social dialogue within a territory leading towards a negotiation table for rural development.

Awareness was growing in SDA that this approach could help the Services to complement each other in their respective work. Consequently, various interviews with SDA officers were conducted with the aim of highlighting commonalities in the approaches developed in the Division through field experiences, and supporting and complementing the key principles put forward in the “Methodological orientations for a participatory and negotiated territorial approach”. In the following sections the resulting elements towards the definition of a common perspective of territorial development within SDA are presented.

### ***1.1 Rational and Use***

Classical rural development approaches do not respond to the complexity of rural contexts. Current changes occurring in rural areas further test the capacities of these approaches to promote rural development.

This document suggests an approach to a Participatory and Negotiated Territorial Development (PNTD) which offers concrete answers to the challenges of improving trust among social actors, strengthening social cohesion and promoting a systemic territorial development.

#### **1.1.1 Failure of top-down approaches and the rise of bottom-up concepts**

In the last 30 years, technical assistance projects were mainly based on top-down, supply-driven approaches. Interventions were defined by sectoral issues (agriculture, natural resource planning and management, soil and water conservation, etc.) and addressed only partially the constraints and potentialities of the territories they dealt with. Therefore they were rarely adapted, nor adaptable, to local contexts. To compensate for these limitations, these purely technical projects became large integrated programmes, which were very often overcharged with activities and thus unmanageable.

A growing awareness from civil society and NGOs for the need to fill the gaps left by these large projects, led to the promotion of bottoms-up approaches and a wider use of participatory methods. Working mainly at grassroots levels these new approaches took into account the real needs of local populations but were limited in scale and not easily replicable when successful. These constraints stemmed from the fact that civil society and NGOs did not have (and still do not) the capacities to integrate local action into national and international governance context.

### **1.1.2 Current challenges in addressing rural development issues**

Rural areas face a changing economic, social and political environment which requires a redefinition of the parameters of their development. Rural actors have to be given the capacities to face the challenges emerging from these changes.

#### ***Decentralization and disengagement of the state cause a lack of public service provision***

Imperfect decentralization – deconcentrating responsibilities without devolving power and without equipping the lower administrative levels with the needed financial and human resources – or disengagement of the state has resulted in severe gaps in the fulfilment of the state's functions. Such inefficiency from the side of public institutions (partially filled by Civil Society Organizations (CSOs) and NGOs) creates obstacles to the realization of actors' projects and cause a decreasing credibility of Public Administration in the eyes of civil society. In turn, this lack of credibility reduces the margins of action of Public Administration when enforcing law and order, redistributing welfare, collecting taxes, and providing basic services.

#### ***Diversity of actors and their projects may cause inefficiencies in local resource use and management***

The diversity of rural people comprises a wide array of actors (public-private, groups and individuals) and does not limit itself to the agricultural sector. Powerful actors influence decisions and people's strategies of life within a territory but they are often not participating in social dialogue, which is essential for sustainable local development. Those actors are for instance the private sector, powerful policy-makers, and landlords. The diversity of actors, their values, and the interdependencies between them often lead to conflicting interests causing the improper use and inefficient management of local resources.

#### ***Interdependencies within and between territories cause difficulties in defining their limits***

Territorial delineation is not an easy task since territories are social products conditioned by their history. Territorial resources are limited which leads to competition over their use among the actors. Another dimension is the competition between territories reinforcing the marginalization of some of them. The dynamics and exchange flows within a territory and between territories (permeability of the territory) also make it very difficult to limit the scope and scale of a territorial intervention.

### **1.1.3 Innovation – added values of the proposed approach**

The Participatory and Negotiated Territorial Development (PNTD) approach sets out strategic lines of territorial development to overcome the challenges described above:

#### ***Building credibility between public and private actors***

In view of the growing competition on limited resources among actors and territories and a decreasing credibility of Public Administration, this approach focuses on establishing and maintaining social dialogue within the territory and restructuring and/or strengthening territorial institutions. Intermediary level institutions have an important role in integrating the territory and its actors in the existing governance framework (aggregation of demands, differentiation of policies).

#### ***Strengthening social cohesion to improve local resource use and management***

Territorial diagnostics are a means to promote dialogue between a plurality of actors. The aim is to reach a negotiated agreement defining territorial development activities that allows the realization of the actor's social, economic and cultural projects and recognizes them as promoters of their own development. A wide participation has to be guaranteed including powerful actors with low interest in dialogue. The proposed approach assumes an inbuilt learning process with the objective to increase social cohesion, strengthen the bargaining power of the marginalized, increase people's organizational capacities and improve their access to information and their abilities to use it.

#### ***Conceiving the territory as an arena for dialogue and negotiation***

A systemic vision of the territory (two dimensions: multi-sectoral and holistic) offers an accurate view of its functioning (dynamics, flows, inter-territorial relations, boundaries) and enables vertical and horizontal integration between territorial scales and levels (e.g. geographic, socio-economic, administrative). Furthermore, working on a territorial level allows focusing on the assets of the territory (including the cultural and natural heritage), its potentialities and constraints. A valorisation of the territorial assets serves to develop synergies within a territory while taking into account linkages with other territories (competition, but also complementarities) and helps to revitalize formerly marginalized territories.

### **Principles of the Approach:**

**Actor based:** Recognition of the heterogeneity of the actors' interests and visions of the territory.

**Territorial based:** Based on the territories as spatial units of analysis, shaped by the social and historical relations between the actors and the territory.

**Dynamic:** Understanding of and learning from the complexity of a changing environment to support positive patterns of change and help mitigate negative patterns.

**Systemic:** Assumption of the complexity of a territorial context and the interdependencies within and between territories.

**Multi-sectoral:** Integration of the social, economic, political, cultural dimensions of the actors' visions of the territory.

**Multi-level:** Integration of different territorial levels and scales in the governance system.

**Participatory and negotiated:** Notion of the territory as a negotiation arena to strengthen dialogue and mutual trust, and increase bargaining power.

## **1.1.4 Objectives and target audience of the document**

The objective of this document is to enable the Rural Development Division as a whole to deal with territoriality and rural development in an integrated way and to give its officers a product at hand which they have built together and which can be used in different regions in discussions with governments, donors and international partners to promote rural development, by:

- Formulating rural development projects;
- Supporting ongoing field activities;
- Supporting decision making processes and strategy formulation;
- Strengthening local development in the context of national regulations and international norms;
- Fostering inter-agency collaboration and partnerships with governments, NGOs and civil society;
- Discussing international strategies for rural development.

## **2 The process**

This chapter describes the key principles and the methodological process of the Negotiated Territorial Development approach.

## ***2.1 Basic principles of the process***

The process must be based on the following principles and be:

- **Coherent** and **pertinent**, in order for the process to be as efficient and effective as possible given available resources (financial resources and time). In this context, precision does not mean the pursuing of in-depth observations and exact data per se, but the attention not to neglect anything important for understanding problem causes and territorial trends.
- **Iterative** and **progressive** in order to be able to come back to a question and draw up new hypotheses, analyses, evaluations, adding new elements to the diagnostic little by little and allowing for a renegotiation of the outcome and agreements.
- **Flexible** and **replicable** both in space (i.e. applicable to different geopolitical, agro-ecological and socio-economic contexts) and in time. The progressive analysis is carried out with a continuous adaptation and responsiveness to changes in the cultural and social context; respecting actors' pace of learning and expression modalities, and in order to ensure that resulting plans are feasible and sustainable. Simplicity and practicality are required in order for the process to be easily understood and to allow actors' involvement in each phase.
- **Learning process**, the methodological approach is not outcome oriented but attention is put on the process of re-establishing social dialogue in order to guide the course towards a negotiated territorial agreement that effectively takes into consideration and involves all the actors.

It is important that the right questions are asked. Open questions start with: who, how, why, when and where. They help people to speak and express themselves and allow having in-depth discussions.

## ***2.2 Phases and key issues describing process***

The process can be operationalise in four main phases.

### ***Views***

Firstly, the different actors' visions of the territory are analysed using the history as a leading thread. This phase reconstructs in a coherent framework the actors' positions, interests, and strategies, and the potentialities and vulnerabilities of their territory. In particular, this phase corresponds to the territorial diagnostic and opens the dialogue among the actors. It serves to put all of them on an equal footing regarding the information on the territory. The context-specific political, institutional and legal framework will be analysed in order to understand the existing rules of the game at regional, national and international level and their influence on local development.

## ***Horizons***

In the second phase, the actors are supported to set out coherent and feasible perspectives for the future development of the territory and to formulate proposals for later negotiation.

Setting up a negotiation table depends on actors' margins of flexibility, their willingness to negotiate and their bargaining power or ability to access the negotiation arena. On the other hand, the historical analysis allows identifying the causes of the existing territorial constraints, understanding actors' visions of territorial development (e.g. access to and use of land and natural resources), and highlighting current dynamics and territorial trends. By validating the diagnostic, the actors become aware of all the issues at stake within the territory, allowing them to formulate possible proposals for territorial development, as a common ground for negotiation.

## ***Negotiation***

Once the preconditions are met and the proposals are made, the involved actors enter the third phase of negotiation. The term "negotiation" here is interpreted in a wider sense that not always refers to conflictive situations. In this sense, it is the tool to aggregate the diversity of interests in a given territory in order to formulate rural development proposals. The negotiation process follows procedures and rules that the actors must agree upon in advance and that are enforced by a credible and legitimised third party. It has to be underlined that the negotiation is not simply about voting proposals and prioritizing them but to find a consensus that satisfies all the interests to the greatest possible extent.

## ***Social Territorial Agreement***

The Social Territorial Agreement (STA) is the result of a participatory process and includes plans of activities or initiatives for local development (at short, medium, and long term) defined through negotiation among the different actors in a given territory.

For the implementation of this contractual agreement external support might be required to build capacities and to access external resources. In addition to the concrete agreement on activities, institutional arrangements or distribution of resources, the process also leads to an improved social cohesion within the territory.

It results in an increased bargaining power of the weakest actors to defend their stakes. It incorporates the diversity of actors' interests that might not otherwise be voiced and integrated in decision-making processes. The overall PNTD process inserts itself in the existing social, economic and political systems and might have an impact also on them. Nevertheless, changes in these systems might be required for the enactment of the agreement.

Finally, the process is intended to lead to a new cycle of negotiation that will enable the actors involved to refine, adapt and complement the agreement they have reached initially. Therefore, the dialogue among actors should be institutionalised to consent to the replication of the negotiated territorial development process and to ensure its sustainability.

### ***2.3 Role of external support of the PNTD process***

The Participatory and Negotiated Territorial Development approach requires the definition of a new role for the professional that acts as an external facilitator and “honest broker” during the whole process. It is his or her task to stimulate social dialogue with the goal to find convergence between the different points of view (See Box).

External support plays a key role in the identification, analysis and provision of coherent information on local problem areas. A multidisciplinary PNTD team will be created (consisting of one or more coordinators, technical experts, administration staff and other key players in territorial development) to get a comprehensive understanding of local problematic issues and research on possible solutions, study the options’ technical feasibility and, finally find ways to achieve a coordinated and effective response to local problems. Moreover, the PNTD team spearheads the process of linkage between the local community and other relevant key-players in the area, supporting integrated territorial planning and providing valuable inputs to municipal and provincial development actors.

Strengthening partnerships with civil society organizations will help in optimising available forces, knowledge, energies, and capacities.

In this case, the NGOs and CSOs play the major role in information analysis, dissemination and exchange, thanks to their direct field experience, while FAO, as an international organization, is called to act as the facilitator of the dialogue among civil society and governments in the national (but also regional and local) and inter-governmental arenas. Therefore, in the PNTD approach participatory tools and methods are both technical and awareness building instruments.

Literature on conflict management suggests that the roles, tasks and responsibilities of the legitimised mediator(s), animator(s) or referee(s) are to be clearly established in the negotiation phase. Also, the negotiation mechanisms and procedures are to be defined in advance. These mechanisms will be context specific with the adoption of aspects of customary procedures.

The mediation role is not part of FAO mandate. The mediator should fulfil certain criteria to be able to facilitate a territorial negotiation. He should have a neutral position, a specific training on conflict management and a part from personal skills and attitudes (e. g. sensibility,

commonality of language and culture with participants), should have a good knowledge of the local context.

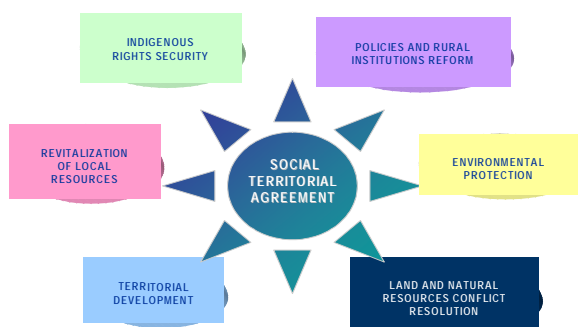
The PNTD team also accompanies the implementation phase of the Social Territorial Agreement and the monitoring and evaluation activities jointly with the actors involved in the process, to allow for the continuous renegotiation of the agreement. Moreover, the team will play a key role in inserting local analysis into a higher territorial level perspective, in order to harmonize local development planning processes and objectives, with plans of higher administrative units, as well as linking local analysis to regional and central level decision making.

## ***2.4 Thematic entry points and scales of intervention***

The key entries for the application of the proposed methodological process towards a social territorial agreement depend on the geopolitical, cultural and socio-economic context. The PNTD process helps actors understand their territorial system in order to face the rural development challenges and to support the sustainability of the process of change.

The Social Territorial Agreement may propose solutions to deal with issues at different scales, and may imply different time frames. The agreement is a necessary instrument for the local ownership of strategies and projects on the territory. These interventions aim at revitalizing territorial economic activities, achieving greater autonomy in the management of local resources by communities, responding to territorial vulnerabilities and improving the use of territorial assets in order to allow for a wider access of marginalized people to basic services and resources management.

To respond to the local demands, the social territorial agreement provides inputs for an adaptation or redefinition of national and local policies, by clarifying the rules of the game and making them shared and respected (e. g. indigenous rights, recognition of customary tenure, environmental protection, land access, natural resources use and management) and strengthening and reforming rural institutions (e. g. cadastre, local organizations, local funds for income generating activities).

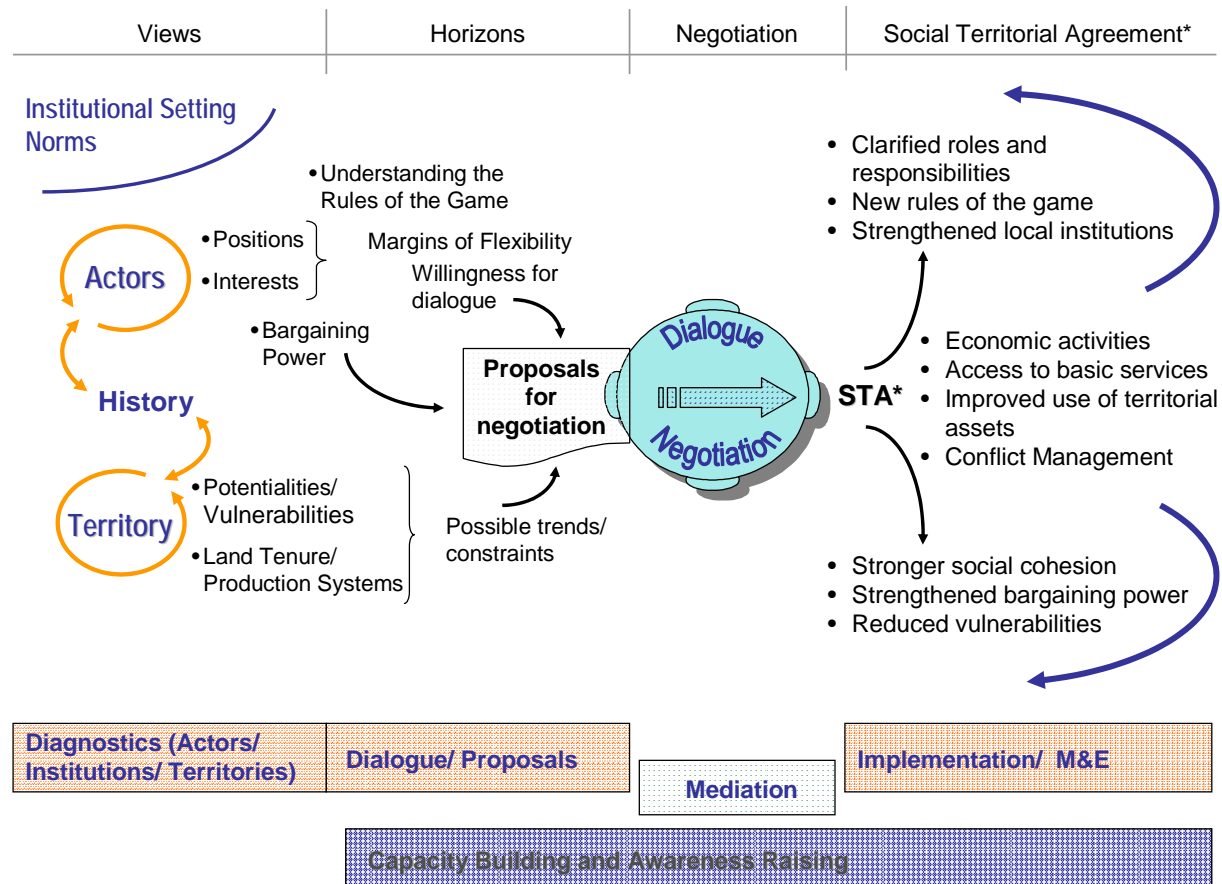


Particularly, this methodological proposal could be a useful tool for analysing the causes of tension arising from competitive access and use of land and natural resources, in order to prevent or manage conflicts.

The approach can be used at different territorial scales and levels depending on the geographic, administrative and/or socio-economic context.

Also, several smaller interventions can feed into a wider process of development.

**Figure 1.- Overall scheme of the NTD process**



## ***2.5 Differences and commonalities with other approaches***

The proposed approach to rural development is based on a systemic vision of the territory with the inbuilt territorial diagnostic being a tool to open dialogue among public and private actors. It has the objective to support a negotiation process for territorial development (towards a Social Territorial Agreement) and to guarantee the enactment of the agreement and the possibility of its renegotiation.

Furthermore, the principles of the PNTD approach are in line with those of other systemic rural development approaches and provide complementary insights into territorial development. In the following paragraphs, several approaches that are at the basis of the present proposal, will be briefly introduced - Liasons Entre Actions de Développement de L'Europe Rural (LEADER)<sup>3</sup>, Sustainable Livelihoods Approach (SLA), Farming Systems (FS), Gestion de Terroirs (GT), Integrated Rural Development (IRD)<sup>4</sup>.- and comparisons will be made with the PNTD approach to better highlight some of its characteristics.

It should be noted that these approaches have been developed to answer to certain changing conditions as they presented themselves in a particular time. One of their main achievements among others was to draw attention to forgotten or underestimated aspects of territorial development. All presented approaches are described here in their “text book version”, and elements that are not explicitly included might nevertheless be drawn on when applying the approaches in the field.

### ***LEADER***

The European Commission's LEADER program, implemented in marginalized areas of the European Union, promotes the creation of Local Action Groups (LAG) designated to propose projects of local development with specific requirements (e. g. area-based, based on a new conception of rurality problems). In this sense the LEADER initiative is project oriented. The members of the LAG come from different sectors (private, public, COs) and they are willing to negotiate the use of the financial resources made available by investors. The agreement of the actors on the strategy for development is only implicit and the actor's sensitization and capacity building process is limited. Furthermore, the risk is that a counter-process results in competition over funds.

The PNTD approach proposes a systemic analysis of the current dynamics and interrelationships between actors and territories. Such an analysis is able to identify and assess the existence of issues of competition on space and resources and the conflicting interests of the different actors, highlighting the initial lack of trust and consensus on territorial development strategies. The Negotiated Territorial Development approach aims at reaching a social territorial agreement. In this sense, the approach suggests a participatory territorial

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<sup>3</sup> <http://www.rural-europe.aeidl.be/>

<sup>4</sup> For an overview of the literature about SLA, GT, FS see FAO “People-centered approaches” LSP Working Paper. September 2003, draft.

diagnostic able to build the preconditions for sustainable interventions, including the maximized use of local resources.

### ***Gestion de Terroirs***

In the “Gestion de Terroirs” (GT) approach, the “*terroir* is regarded as a socially and geographically defined space within which community resources and associated rights are located in order to satisfy their needs”<sup>5</sup>. It focuses on community based natural resources management, empowerment of local communities and their capacity building, and stakeholder involvement in the identification of local priorities, though participatory rural development processes.

Yet, it has experienced relative high start up cost and dependency from outside technical expertise and donor funds for project implementation. Furthermore, it has not always been successful in counteracting local elites taking over control and in including marginal groups in the decision-making processes. The local projects tend to operate in relative autonomy thus macro and micro linkages are not established and policy vacuums have not yet been filled.

The PNTD approach allows for the mobilization of local resources for negotiated territorial development projects through a process that promotes decentralization and the strengthening of financial, administrative and political capacities of the intermediary government level to provide services. This approach also improves organizational capacities of local institutions, and stimulates the pro-active involvement of social actors in the design and implementation of the activities and the mobilization of local resources and control over endogenous factors of development. Finally, the approach allows for a negotiated aggregation of local demands (through a Social Territorial Agreement) and provides inputs for an adaptation or redefinition of national and local policies in order to meet such demands.

### ***Sustainable Livelihoods Approach***

The Sustainable Livelihoods Approach (SLA) considers the Pentagon of Assets (Human, Natural, Financial, Physical and Social capital) available to rural people as a paradigm of any effort to promote sustainable development. The approach focuses on livelihood outcomes instead of project objectives with an emphasis on holistic diagnosis. In practice sectoral entry points were often used. Its focus is mainly on community and households as an entry point for projects without a vertical integration of development strategies.

The PNTD approach consents an integration (both cross-sectoral and vertical) taking directly into account the heterogeneity of social actors and the differentiated strategies to implement territorial based development projects.

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<sup>5</sup> *Ibidem*

### ***Farming Systems***

The Farming Systems approach (FS) focuses on agricultural development as a key element in poverty reduction in both rural and urban areas. It analyzes the functioning of the individual farming system to provide technical answers to productive problems also building human capital.

The PNTD approach goes beyond the classical analysis of the rural space as a productive system to address rural-urban linkages, resulting flows and dynamics and their efficiencies in promoting local development and articulating with national and international markets. The bottom up and negotiated approach promoted by the NTD represents a consensual decision making process which involves all the actors of the territory in finding solutions for territorial development issues on the bases of socio-political considerations rather more than purely technical or economical concerns.

### ***Integrated Rural Development***

Finally, Integrated Rural Development (IRD) is a multi-sectoral approach to rural development with projects tending to be production oriented, large scale and top-down interventions. The notions of local capacity building and institutional sustainability were not given much importance in IRD projects.

This and all of the above mentioned people-centered approaches focus more on the outcome than on the process when evaluating the interventions carried out.

The PNTD approach is a learning process that enables the formulation and realization of bottom up initiatives. Taking into account policies and practices, the NTD approach addresses the question of how local actors can be empowered to use available assets for their territorial development projects.

## **3 The Participatory and Negotiated Territorial Development Approach (PNTD)**

In this chapter the four phases of the PNTD approach will be described in more detail, and important issues will be highlighted and illustrated with concrete examples from field experiences. In addition, some boxes presenting in-depth descriptions of key points will be directly written by SDA officers and inserted when agreed with them.

### **Phase 1: Views – Understanding the actors and the territory as a social product**

The objective of this phase is to carry out a diagnostic process of the actual situation by taking into account the actors concerned and the territory as a whole system. The systemic vision implies a vertical and horizontal dimension of assessment. This process involves qualifying

the territory and conducting an analysis of actors and institutions to understand the issues at stake and their causes and interdependencies. Using participatory tools and methods ensures that the process implementation is stimulating for social dialogue.

The historical analysis of the territorial system is essential for a coherent understanding of actors' global visions and livelihood strategies and for formulating possible scenarios of evolution of the main issues under discussion (e.g. right and access to resources, land use and management, relationships within the whole productive chain).

### ***Information on the required intervention***

Before assessing the actor's positions and interests, and the potentialities and vulnerabilities of the territory, it is very important to identify the explicit or implicit reasons for the request of external support and their implications with regard to the modalities of interventions. Obviously, the requester can only draw a partial image of the problem.

This analytical process is significant because it brings to light certain problems, the existence of which is often well known, but which, for one reason or another, have not been expressed or taken into account (the unsaid, hidden, and disguised issues). The formulation of these problems is important, but the changes that this assessment can produce in the perception by the various stakeholders of the territorial issues, are even more important.

#### **The following questions arise:**

- Why is an intervention needed?
- How to identify and stimulate demands?

### ***The Actors of the territory***

The first step of the diagnostic is the identification of the actors in the territory and the assessment, through a participatory stakeholder analysis of their visions, interests, power relations, and margins of flexibility.

It is fundamental to understand along the diagnostic, the rules of the game that have shaped the relationships among the actors.

#### **The following questions arise:**

- Who are the actors in this territory?
- What are their visions, positions, interests, power relations, margins of flexibility?
- What is the actor's understanding of the rules of the game?

### ***Analysis of the territory***

The PNTD approach allows the actors to position themselves and their territory within the existing political, socio-economic system. The systemic analysis of the territory is a key instrument for the study of a geographical space defined less by boundaries than by existing exchange flows, superimpositions, interferences, trends and dynamics. Qualifying the territory

and its assets will lead to a definition of territorial potentialities or problem areas to focus an intervention.

The actors themselves constitute one of the entry points in identifying critical areas for territorial management and it will be up to them to explain why and how their territorial system has evolved through history and to highlight the potentialities and constraints of their territory.

**The following questions arise:**

- How is the territory delineated?
- What are the potentialities and constraints of the actors' territory?
- What is the impact of the institutional setting on the territorial system?

## **Phase 2: Horizons – Dialogue and proposals**

It is important that the diagnostics produced portray a coherent framework of the territorial situation and its problems. These findings will be used as a means to promote a discussion among the actors. They themselves will complement the analysis with their views of the territory and its functioning and thus validate the findings.

The techniques used throughout the analytical process of the diagnostics have the scope to sensitize the actors on the necessity for dialogue and raise their awareness of the different interests at stake. At this stage concrete capacity building activities can be initiated to support the consolidation of the learning process.

Once the actors have accepted the different views of the situation and the preconditions for dialogue are met (the actors' margins of flexibility, their willingness and ability to dialogue), concrete proposals for development can be elaborated. These proposals should include alternative scenarios that, through the establishment of a common ground, will eventually ease the consensus building process.

### ***Outlining coherent and feasible proposals for territorial development***

The diagnostic results in a coherent assessment of the strengths and weaknesses of the existing territorial setting and of the causes of the problems identified. These results will assist in the formulation of feasible proposals for territorial development.

These proposals for intervention will be the key subjects for discussion among the participants at the negotiation table. From the very start of the process, the efforts should be directed to find ways to (re-)establish dialogue and trust among the actors and to find a common ground to start territorial dialogue.

**The following questions arise:**

- What are the strengths and weaknesses of the existing territorial setting?
- What are the proposals for negotiation in the territory?

- How to guarantee the feasibility of the proposals?
- How to (re-) establish dialogue and trust among the actors?
- What is the common ground to start territorial dialogue?

### ***Accompanying the participatory process and supporting social dialogue***

Supporting the establishment of a continuous collaboration, clear communication and transparent exchange of information among the actors about their territorial development is essential in order to promote actors' sensitisation and joint analysis of local issues. The increased involvement of the actors in the training-action process, especially the weak actors in terms of human capital, is a basic precondition for creating ownership, new capacities and increased bargaining power.

#### **The following questions arise:**

- How can information on the territory and the demand be shared and made public?
- How can a sensitization process be carried out to create ownership and increase bargaining power?
- How to activate a capacity building process?

### **Phase 3: Negotiation process – seeking consensus for the development of the territory**

The previous phases served to reconstruct the complexity of the territorial dynamics, and to recognize the diversity of actors' perspectives. It is essential in this phase that a wide array of actors is represented with proposals for negotiation.

To accommodate or combine different proposals in a compromise, a wide participation of actors has to be guaranteed. Support should be given to also allow weak actors to participate constructively in the negotiation, which implies increasing their bargaining power.

The negotiation process follows rules that the actors agreed upon and that are enforced by a credible third party. In this sense, the dialogue among actors is institutionalized to promote the replication of the process and the sustainability of negotiated territorial development.

The final compromise not only contains the activities to be undertaken but also has to outline clear roles and responsibilities for its implementation.

### ***Ensuring participation of all actors and maintaining the dialogue***

The proposals for territorial development highlight the common ground on which negotiation can start. A basic condition for the negotiation process is to ensure representative participation by all the actors. The empowerment of all the participants to take part in the dialogue and voice their concerns is a first step towards the creation of a consensus. The principles of negotiation should be based on local social norms and values and agreed upon by all parties. All the actors should be convinced that negotiation is the best way to pursue their interests.

**The following questions arise:**

- How to ensure participation of key actors in the negotiation process?
- What capacities and bargaining power do actors need to participate in the negotiation?
- How to initiate the creation of a consensus?

***Negotiating territorial development projects***

A well-trained legitimate mediator who is credible to all parties and has sufficient knowledge of the local sociology is needed for the functioning of the negotiation process. The availability of alternative options to all parties is essential to maintain dialogue. Furthermore, indicators for satisfying solutions have to be developed by the participants and agreed upon unanimously. The negotiation table should be institutionalized to become a sustainable platform for territorial dialogue. The role of these new institutions should be recognized by the local government and should not challenge its jurisdictions.

**The following questions arise:**

- What institutions are needed for the negotiation process?
- What are the roles of the different actors and in particular the local government?
- How to facilitate the creation of a consensus?

**Phase 4: Social Territorial Agreement – influencing the policy environment**

The Social Territorial Agreement (STA) is the result of a participatory process leading to a negotiated agreement on territorial development among a plurality of actors. It includes the diversity of actors' interests that might not otherwise be voiced and integrated in the decision-making processes for rural development.

The process towards the STA renews social ties leading to a co-constructed territorial development project. To implement STA, actors need to valorise existing resources to ensure optimisation of their use. However, technical support might be required to create monitoring and evaluation instruments which enable actors to become skilled at maintaining social dialogue and voicing their needs. These capacities allow them to renegotiate the agreement.

The process results in strengthening capacities of the governance system for the development of horizontal and vertical dialogue and the institutional mechanisms needed therefore. Such processes and mechanisms enable government, private sector and civil society actors to work together over time to make policy changes and take action to promote bottom-up decision making processes.

***Implementation of the agreement***

The agreement reached as a result of the negotiation process should define all the prerequisites (e.g. human, physical, social, and financial resources), the instruments and the roles and responsibilities required for the implementation of a Social Territorial Agreement.

Adequate monitoring and evaluation mechanisms should be put in place to guarantee the actor's ownership on the projects and the sustainability of the negotiated territorial development process.

**The following questions arise:**

- What are the requirements to implement the Social Territorial Agreement?
- What are the instruments, mechanisms, responsibilities needed?
- How to maximize the use of local resources (human, natural, financial, social, physical) before mobilizing external resources?

***Contributing to local, regional and national policies, laws, rules and regulations***

The social territorial agreement should be coherent with the national regulatory and legal system or capable of moulding it in order to meet the conditions for enactment. The key issues for such a harmonization are the creation of micro-macro linkages, the definition of proper roles and the strengthening of mid-level administrations' capacities of functioning as negotiation arenas for territorial development.

Furthermore, the factors that contribute to the ability of the rural poor to use the newly established rules of the game, should be identified and supported. Local actors should be motivated to take advantage of the opportunities created by the negotiated territorial development process.

**The following questions arise:**

- How to support the creation of micro-macro linkages?
- What is the role of intermediate levels and what capacities do they need?
- How to apply the principle of subsidiarity to the development of the territory?
- What (combination of) factors contribute to the ability of the rural poor to use the new rules of the game?
- How to create incentives to motivate local actors to use the opportunities created by the new rules?

## **4 Conclusions**

Commonly, rural development is understood as an overarching concept recognizing that any support activities targeted to improve people's lives in rural areas should have a multi-sectoral and integrated focus.

The objective of this document is not to give yet another answer to preconceived problems but to help insert technical assistance related to agricultural production, activities for local income generation or natural resource access and management into a wider framework of rural development as defined above. Hence, the Participatory and Negotiated Territorial Development (PNTD) approach is an inclusive methodology that combines technical interventions with a holistic vision of territorial development. It supports bottom-up and

participatory decision-making processes and encourages social dialogue and partnerships between the actors within a territory.

Working on the challenges of rural development in an integrated and systemic manner means overcoming the goal oriented focus of classical interventions. It is also about linking local analysis processes (and their outputs, for instance the social territorial agreement) with higher level decision-making bodies in order to ensure the participation of all actors in the process, the effectiveness and sustainability of regional development initiatives and the strengthening of social dialogue.

The negotiation table oriented towards a Social Territorial Agreement (and its implementation) becomes the central pivot to confront the different territorial issues emerging from an actor-based diagnostic. This means moving from a sectoral focus to a systemic approach that takes into account the complexity and inter-dependence of the elements of a territorial system (endogenous and exogenous) and the actors' visions and strategies at play in rural development. Along the process, the actors will have to take conscious responsibility for their projects in order to achieve a sustainable negotiated territorial development.

A key element of the PNTD approach under discussion is the role of "honest broker" played by any external supporter. Those professionals have a technical as well as a facilitating role. They should develop analytical skills and proper action-research attitudes in order to carry out a local analysis of critical issues to build a comprehensive understanding of problems, their relevance and impact as well as future risks connected to them. It is their task to open the discussion, support the organization of participation within the local community and create linkages between the local community and other relevant key players in the area. Finally, the multidisciplinary team promotes dialogue, partnership and concerted action, and supports the different institutional levels for the implementation of the negotiated agreements.

Does this mean we may better deal with rural development issues thanks to this approach? The major innovation of this approach to rural development is the focus on stimulating and supporting dialogue within a territory. Social dialogue, whether in the form of a conflict resolution or an agreement on territorial development projects, is essential to reconstruct the social fabric of a territory, to elaborate synergies within the territorial system and to recognize all the actors as promoters of territorial development, integrating the diversity of their strategies.

The main challenge is to stimulate a learning process supporting rural actors to find sustainable solutions to territorial development issues. It will then not be an easy task to ensure that they attain the capacities and the means to influence the political and institutional regulatory framework and thus, move towards good local governance.

#### **Note**

Paper prepared for the Workshop "Sustainability of agriculture in the enlarged Europe under reformed CAP", organised by the Institute for Prospective Technological Studies, DG JRC European Commission, Seville 23-24 September, 2004.



# Key issues on the policy agenda for sustainable agriculture

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## 1 Introduction

Agriculture in the new Member States (NMSs) has gone through a series of unprecedented “shocks” or changes in the last 15 years, including the dismantling of the old socialist system, the introduction of market economies, and latterly enlargement, which means being a full part of a single market and adopting EU common regulations (*acquis communautaire*). Intense monitoring of the industry is ongoing but it is still too early to verify the economic impacts of all these changes on such issues as trade, investment, and comparative advantage.

It is important to look at the whole food chain and not just farming *per se*. Huge changes of internationalisation, concentration and globalisation are taking place in the retail and processing sectors. Competition within the single market is now much more intense and the benefits of a greater choice of foods available to consumers are already apparent.

One of the effects of the retailing revolution and consumer preferences is a marked drive towards assured quality of food. This trend has been reinforced by the adoption of common regulations that apply to all food producers and which have been supported by both national and EU assistance programmes for this sector. These requirements get passed back to the farm especially in the milk sector. In other enterprises we are likely to see technical changes in what is produced according to expressed market preferences, e.g. fruit varieties, and fat content of meat.

Much academic work on sustainability has been concerned with the development of definitions and monitoring indicators. At the political level there is overriding concern about the ability of the agricultural sectors to compete within a single market and more generally internationally and still to provide an adequate living for the large parts of the population that are dependent on the sector. These social and economic concerns have in many cases overridden concern about soil and water management, pollution and wildlife and the potential of the sector to contribute positively to issues such as global warming.

The cause of sustainability is not assisted by the following interrelated tendencies:

- short term and polarised political agendas which results in “non joined up” thinking and actions,

- inadequate information about many indicators for sustainability,
- inappropriate analysis of sustainability issues,
- hence poor and partial policies and solutions.

## **2 Prioritisation**

The adoption of priorities for sustainability is difficult as the spend of agricultural and rural Ministries as well as the content of political debates show. The Organic movement as yet covers a very small amount of output while the sustainability question applies to the whole industry. Likewise, the focus on special areas while is welcomed does not, for the most part, impact on mainstream agriculture. The competition between objectives such as structural adjustment and sustainability do not seem to be fully appreciated e.g. the relationship between intensity and biodiversity or the interaction between higher crop yields (as a basis for enhanced competitiveness) and the importance of soil management.

The contribution of agriculture to alleviating global warming or indeed to the replenishment of aquifers though improved methods of water retention hardly seems to have been recognised. Point pollution from large livestock units and the management of more diffuse pollution also do not seem to have been sufficiently considered.

## **3 Information**

It is always the case that statistics can only illustrate the questions that are asked. As sustainability is, for the most part, a new subject area then information that is collected at the present time may not address these questions. In particular, evidence on the changing levels of what might be termed the "natural capital stock" such as the state of aquifers, the organic status of soils, species diversity and the extent and exposure to such factors as erosion, drought and flooding is needed.

The statistical basis for production estimates is by and large good but systems have not yet caught up with the realities of the operation of market economies. How good are price reporting systems? Do they reflect fully, accurately and in time the utilities of quality, place and season? How efficient, as measured by marketing margins, are current marketing arrangements? How reliable are trade statistics, given the many informal transactions that take place?

Nor is enough information available concerning the social capital of farm families. Much estimation is required to appreciate their situation especially for off farm earnings, their skills and opportunities, how far they have to travel to get work and the extent of any migration and remittances therefrom. It is also very difficult to obtain information about the rural population since most data is collected by administrative area and not according to direct definitions of rurality.

## 4 Analysis

'One size fits all' is a common assumption. In reality there are what may be termed “two agricultures”, one of small units and one of larger more commercial units. The distinctive features of the two types are that small units depend for a greater part of their livelihood on social payments and off farm employment and hence are directly dependent on rural and general economic prosperity. Larger farms rely more on the sale of agricultural products and hence on farm prices. Small farms use capital much less effectively than large ones but tend not to have as much or indeed any debt. Capital grant schemes and credit subsidies are thus more appropriate to the needs of larger farmers. Measures to foster employment are a greater relevance to the small farm sector. But the arguments are rarely put in these terms as the distinction is often not made.

Estimates are sometimes made of aggregate costs of restoring the fixed capital stock in farming, or for the processing sector, of adopting modern quality standards. Such analyses rarely take into account that restoring old systems to their original or preferred state is rarely the best option. Modernisation invariably involves the redundancy of many existing units and thus saves on investment.

A related issue concerns the availability of capital and credit needs. In most societies the distribution of capital and also debt is highly skewed. The argument that all farmers and food processors need credit based on some average indicator is almost always false.

A similar situation also occurs in the designation of poorer less prosperous regions for special development assistance. It is often the case that there is more variation in individual human welfare within regions than between regions. A regional approach can thus result in poor people living in relatively wealthy regions being neglected.

A final fallacy is that agricultural industry is the main driver of the rural economy. Very rarely is this the case and yet the belief persists and policies are designed and financed accordingly.

## 5 Policies and solutions

*Cross compliance* is the current issue as the conditions that have to be met to receive the single farm payments. Will it work as a composite measure? It seems to be something akin to blackmail rather than a land management contract. Let us hope that land managers will not respond in a minimalist way.

Will *decoupled single payments* alter the way land is farmed and food produced? Other changes are also taking place such as the quality assurances needed by supermarkets and consumers.

Cross compliance distracts from the real importance of several sustainability issues. These need special policies.

It should be remembered that regulation is only one approach – incentives and education are others including tradable permits in some situations if objectives are to be met efficiently.

Policies can only ever be effective if they can be implemented. It is important to design schemes which are feasible to operate (bearing in mind the capacity of Knowledge, Research and Information systems which tend to be under-resourced) and which intended beneficiaries will take up.

There is normally a conflict between the gaining and spending of public support as opposed to achieving the objectives of programmes or policies. An associated point is the tendency to spend public money on ameliorating symptoms rather than to increase the speed and certainty of necessary adjustment.

Normally, in enhancing sustainability there will be a need to emphasize particular issues at any one time and then to alter priorities according to the situation. Judgments over the balance of the various components of sustainability cannot be avoided. These judgments depend on the preferences of many different stakeholders who should in some way be involved in both monitoring and decisions.

## **Note**

Paper prepared for the Workshop “Sustainability of agriculture in the enlarged Europe under reformed CAP”, organised by the Institute for Prospective Technological Studies, DG JRC European Commission, Seville 23-24 September, 2004.

# **Sustainable agriculture and distributional effects of policy intervention: an overview**

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## **Introduction**

The interest in the sustainability of agriculture gains a new impetus from better understanding the role agriculture plays in general economic growth, and as a reflection of the criticisms of the negative externalities of Green Revolution production techniques (such as increased soil pollution, landscape depletion, or deepened rural disparities) (Andreoli and Tellarini 2000; Harris 2001). Farming systems are expected to go under pressure over the next half-century in order to meet society demands (Ruttan 1994). The issue is now to find ways to steer the emergence of ecologically sustainable farming systems, able to ensure sufficient output per capita for an expected 8 billion world population (Harris 2001). At the same time, agricultural policies aiming at steering such development have to also consider the distributional effects of their intervention.

The aim of this paper is to provide the background for the discussion on agricultural sustainability and to relate the distributional effects of agricultural policy with the sustainable agriculture agenda. For this, a brief overview of some relevant aspects related to the concept of agricultural sustainability (definition, aim, and operationalisation) is provided in section 2, while several considerations related to the distributional issues on the sustainability agenda are included in section 3.

## **Some conceptual considerations**

‘Sustainability’ can be thought as the ability of an attribute to maintain itself, i.e. not to decline with the passage of time, given that in a dynamic context, an unsustainable attribute or variable may decline in various ways under the effects of endogenous or exogenous factors (Tisdell, 1996). Agricultural sustainability is often seen as the branch of sustainable development applied to agriculture. A comprehensive review of the meaning and evolution of the sustainability concept is provided in Ruttan (1994). Sustainable development itself was defined as “development which meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development 1987, p. 43). This definition makes the link with the concept of sustainable

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Note: the views expressed here are of the author only and may not in any circumstances be regarded as stating an official position of the European Commission. Comments of Sergio Gomez y Paloma, Tomas Ratinger and Dimitri Nikolov on earlier drafts of this paper are gratefully acknowledged.

agricultural development that emphasises on the dynamics of agricultural systems at farm and regional levels (Bontkes and Keulen 2003).

*The definition of agricultural sustainability depends on the discipline, professional background, or researcher's particular interests (Haberl, Fisher-Kowalski et al. 2004). Moreover, the definition is continuously modified to reflect for example "the increasing concern over agriculturally related environmental problems" (Lockeretz 1988, p. 32). The need of various authors to provide their own definition of sustainability noticed in numerous publications and documents, as well as the large amount of definitions associated to this concept (over 800 published definitions of sustainable agriculture (Francis and Hegyes 1988), and about 40 presented at a single conference event (Doll 1990)) were perceived as symptoms of either semantic or contextual confusions (Lockeretz 1988). Moreover, the diversity of definitions generated a range of views about what are the aims of agricultural sustainability, the list including goals such as (i) achievement of food sufficiency, (ii) ensurance of stewardship of natural resources, (iii) maintenance of social well-being (Peterson and Norman 2001) or community (Lowrance, Hendrix et al. 1986), (iv) sustenance of welfare over time (European Commission, 2001), (v) taking into account consumers' concerns (European Commission 2004), or (vi) better reflecting social objectives. This diversity of views is somehow justified by the fact that "agricultural sustainability tends to be site-specific (i.e. at the field, farm, and community levels)" (Peterson and Norman 2001, p.13; also Byerlee and Murgai 2001), and it is strongly influenced by developments at higher levels (i.e. national policies, globalisation trends, or international markets). However, from an analytical perspective to assume that sustainability is the result of society-nature interaction is, on the one hand, challenging given the need to find connections between several disciplines, while on the other hand, it overcomes the "simplistic idea that sustainability can be achieved by adding a third, 'environmental' dimension to the classical policy goals of improving economic performance and social well-being" (Haberl, Fisher-Kowalski et al. 2004).*

Disagreements about agricultural sustainability emerge from (a) different views about what is to be sustained;<sup>2</sup> (b) the length of time during which the characteristic(s) are to be sustained; (c) adequate thresholds against which to evaluate the current sustainability level and/or to account the eventual reach of agricultural sustainability; (d) methodological issues (Carpenter 1995; Sen, 1992). For example, to the essential question "*what is to be sustained?*", it is clear that where environmental degradation is a cause of main concern, then preservation of soil, water, air and biodiversity quality and role they play in the agricultural production is the answer. Equally, where the level of agricultural income is too low to ensure the continuation

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<sup>2</sup>(a) **Constant consumption** assumption relies on the *weak sustainability* concept that implies perfect substitution in production between natural capital (natural resources) and man-made capital (physical capital). Inter-generational equity or transfers of capital/goods to next generations are not considered in this case; the maintenance of general capacity to reproduce suffices.

(b) **Constant stock of natural resources** places importance on the form of the inter-generational transfer of productive capacity. The *strong sustainability rule* says that natural and man-made capitals are complements in the production process. Irreproducible natural capital acts as limiting factor of production, from where the need to conserved it for production to be sustainable. The strong sustainability concept is defended on grounds that include (a) uncertainty of consequences of depleting non-renewable resources, (b) irreversibility of natural resources depletion, and (c) multiple uses of natural resources.

(c) **Inter-generational equity** does not consider the substitutability or complementarity between natural and human capital. It requires meeting the needs of present without compromising the ability of future generations to meet their need, leaving free field to defining the measure of inter-generational equity to be met, and opens this way the field for testing different criteria and their contribution to sustainability achievement (Hoag, Popp et al. 1998).

of the production process and/or to secure a reasonable standard of living of the farmer and his family, then this should be the first issue to address on the agricultural sustainability agenda.

Consequently, agricultural sustainability was defined either in *techno-economic*, *ecological* (ability/not to support the present level of per capital consumption for a continuously population growth), or *community* (supporting self-reliant stewardship-conscious rural communities) terms (Ruttan 1994). Most definitions, however, seem to converge to three basic views of the dimensions and goals of agricultural sustainability, namely economic efficiency, environmental stability, and intergenerational equity (Pannell and Schilizzi 1999).

In this debate, the farming system is seen as the appropriate level to assess agricultural sustainability in order to provide conclusions relevant for the policy-making process, since the farming system is the level where overall decisions take place, and “the notion of sustainable agriculture require us to consider how farming systems ought to appear if they are part of an economy on a sustainable path” (Peterson and Norman 2001, p.8). Authors like Lynam and Herdt (1989) have seen the sustainability of *farming systems* as the capacity “to maintain output at a level approximately equal or greater than its historical average, with the approximation determined by its historical level of variability”. Conway (1985) noted that “sustainability is the ability of a system to maintain productivity in spite of a major disturbance, such as caused by intensive stress or a large perturbation”.

The emergence of sustainable farming systems is an evolutionary process, implying a time component, sufficient to allow the transition from traditional to modern farming, making that “a sustainable farming system in any country would not be completely traditional or modern but would combine the strengths of each” (Peterson and Norman 2001 p. 20). The factors that determine the type of farming system and influence its productivity and sustainability are generally classified into (a) *exogenous* (e.g. community structures, norms and beliefs; external institutions affecting input and output sides) on which farmers have little influence or control, and (b) *endogenous* (e.g. farm household characteristics, farm internal decision-making structures) (Peterson and Norman 2001). Whether or not a sustainable farming system ultimately emerges depends on the bio-physical conditions as well as the external socio-economic environment that guide the series of choices the farmers/householders make (Peterson and Norman 2001).

### ***1.1 Dimensions of sustainable agriculture***

As already noted, most of the current approaches to understand sustainable agriculture see it as a multi-dimensional concept, with the economic, environmental and social dimensions being the most commonly used for operationalisation. To these three dimensions some authors add a fourth, the institutional one, seen as particularly relevant in the context of transition economies (Sumelius 2000; Hagedorn 2003). This section briefly revises some of the methodological aspects related to each dimension of sustainability from the farm level perspective.

***The economic dimension.*** In the economic and non-economic issues debate about agricultural sustainability, traditional growth-oriented market economists tend to focus more on efficiency-related matters and “to give short shrift to what they believe to be extraneous issues such as concerns about equity” (Carpenter 1995). Particular methodological issues when measuring economic sustainability include the discounting rate to be used, private versus social costs (negative externalities); non-market benefits (positive externalities); economic flexibility; and

income vs. risk preferences. Some of the criticisms of the neoclassical approach to measuring economic sustainability are related to the weight this approach places on using discounting methods (i.e. imposing an explicit choice on the welfare of present and future generation), and the neglect of the need to conserve the natural capital. However, as some authors put it, “if natural capital has a special and unique importance, then neo-classical economic efficiency will not suffice for sustainability” (Harris 2000, p. 9).

For the farm system level, some authors are clear-cut: “if a system doesn’t return enough *income* to let the farmer remain in business, it isn’t sustainable” (Madden, 1987 cited in Lockeretz 1988, p. 29). Sustainability at farming system level would hence imply bringing about *changes in farm practices* that would improve the efficiency in the use of all resources and increase the profitability of the farming enterprise and its overall income level. On short, economic sustainability is a necessary but not sufficient condition for sustainability (Pearce and Turner 1990).

***Environmental dimension.*** The environmental component of sustainability was increasingly recognised over the last recent years, and tends to prevail nowadays in the debate about agricultural sustainability, as a reflection of the negative externalities modern production technologies have on the environment.

In their seminal work, Costanza, d’Arge *et al.* (1997) pointed at the hidden values of the direct and indirect services the ecological systems make to human welfare. However, insufficient understanding of those services, as well as failure to attach them a market value, often forces the ecological systems to the periphery of policy decision-making (Constanza 2000). However, as it cannot be argued that agricultural sustainability aims to maintain the long-term equilibrium of natural systems - given that by their very nature, these systems are self-organising dynamic systems (Haberl, Fisher-Kowalski *et al.* 2004) - it can be stated that from the environmental perspective, agricultural sustainability deals with the long-term maintenance of the productive capacity of the natural resources (Byerlee and Murgai 2001). In this vein, issues such as preservation of biological diversity, farmed landscape, cultural heritage features, protection of land against desertification or erosion, and against natural disasters exacerbated by human intervention (European Commission 2000) belong to the environmental sustainability agenda.

The importance of the interdependence environment - economic performance is now acknowledged, but as the Curry Report (2002) puts it, “though nothing will happen without *profit*, profit itself will not return unless the industry’s environmental problems are addressed”. At the farm level, the perception of environmental problems is more focused on site-specific issues, such as waste and water management. Some authors find that the motivations to engage in pro-environmental activities are low where their main concerns are to solve first financial and social security of their family; where farmers are interested to engage in pro-environmental activities, investment capacity is limited, and the range of farming practices to be modified is rather low (Majewski, Bednarek *et al.* 2002).

***The social dimension of sustainability,*** a dimension “which has more of a cultural flavour or identity” (Peterson and Norman 2001, p. 2) is nowadays not often addressed explicitly in the assessment of agricultural sustainability. Most frequently, difficulties to measure this dimension arise from identifying appropriate quantitative variables, especially when the attempts are to conduct the assessment in the mainstream (neoclassic) economics framework.

Most often, institutional economics, combined with input from other areas (such as sociology) provide the conceptual background for assessing social sustainability. Some attempts to operationalise this dimension rely on variables such as degree of social integration or marginalisation of farmers, or their access to alternative employment opportunities. The perceptions vary also about the different levels where the assessment of social sustainability can be possibly analysed. In attempting to operationalise this dimension, some authors distinguish a cultural and a material component of ‘society’, the later component including the human population and the associated physical infrastructure (Weisz, Fischer-Kowalski *et al.* 2001). These are elements to which proxies can be easier attached during operationalisation.

Moreover, equity considerations are part of the social sustainability debate, and “issues such as equity need to be addressed prior to improving efficiency and sustainability” (Parthasarathy 2002, p. 297). In agriculture, reduction of the share of rural unemployment has potentially high equity effects and could influence through a chain reaction the whole rural economy (Rasul and Thapa 2004). The equity considerations assessing social sustainability can be on the one hand criticised on the grounds that provide an incomplete view of the complexity of this dimension but on the other hand it allows using the neoclassical framework and its apparatus.

The *institutional dimension* of sustainability considers the impact of institutions (such as legal, political, and social systems) on the economic performance of the context where they apply, including the farming system level. Institutional constraints influence the sustainability of farming systems acting mainly on their level of profitability and stability. For example, where a lenient attitude towards monitoring and enforcement of environmental regulations prevail, the expectations would be for a less sustainable agricultural sector (Suchanek, Slangen *et al.* 2001). Brinkerhoff and Goldsmith (1992) definition of institutional sustainability as “the ability of an organization to produce outputs of sufficient value so that it can acquire enough inputs to continue production at a steady or growing rate” is relevant when using the farming system as unit of analysis. The institutional constraints to sustainability of farming systems include aspects such as (a) property rights to land (needed to stimulate investments in improving land quality and maintenance as well as to steer technical change), (b) credit markets (in particular free access and services adjusted to local context such as micro-credit), (c) extension services and education (that would support decision-makers to make informed choices, and provide appropriate management knowledge), (d) infrastructure, (e) access to markets.

## 1.2 Operationalisation issues

Stating the aims of sustainability is easier than defining it (Pretty 1995; Hoag, Popp *et al.* 1998). This perception is justified on the grounds that the provision of a definition for the concept of sustainability calls immediately for its measurement. At the same time, the mixture of positive and normative statements of the definition of sustainability makes difficult its operationalisation (Rigby and Caceres 1997). Advocating for a *system approach* calls for a holistic interpretation of the farm agro-ecosystem, allowing “pedo-climatic features, spatial aspects, impact of alternative production practices and their economic performances to be addressed” (Pacini, Giesen *et al.* 2004 p. 172), and relevant proxies needing to be identified for each of these aspects.

One of the difficulties when *assessing the sustainability of farming systems* reside in the fact that sustainable farming practices themselves are not clearly defined (exception making the

organic farming, for which clear rules and standards exist). The debate on which methodological approach is more suitable confronts the partisans of neoclassic economics that favour the use of quantitative approaches with the supporters of using qualitative and more informal methods to reach relevant research hypotheses (Parthasarathy 2002; Twomlow, O'Neill *et al.* 2002). The challenge to the neoclassic approach to sustainability assessment is the heavy reliance on quantitative methods and the high importance attached to hard data interpreted in strictly positivist and empiricist way, an approach that comes at the cost of “playing down data in the form of people’s perspectives and opinions” that “makes impact assessment exercises the poorer” (Parthasarathy 2002, p. 297).

The preferred measurement technique of agricultural sustainability depends on the relative importance researcher(s) give to one or another of the components of the concept. For example, “biological and physical scientists have tended to focus on biophysical measures of sustainability, such as crop yields on the output side, and indicators of soil and water quality on the input side” (Byerlee and Murgai 2001). The difference of perceptions of the same phenomenon/effect is also maintained when the same aspect of sustainability is considered. When evaluating the efficiency of adopting new technologies, an economist would conclude that ‘progressive’ farmers would benefit more (i.e. reach higher profits), while a soil scientist would note soil deterioration as consequence of adoption (Parthasarathy 2002).

Given the above challenges, most of the measurement methods developed pay special attention to the environmental component, often combined with the economic one. Environmental impacts are location-specific and intrinsically connected with production decisions. This makes *mathematical programming techniques* suitable for the analysis. However, environmental-economic models usually include a limited number of environmental impacts that can lead to misjudgements in the policy making process and conflicts between different governmental programmes or regulations (Pacini, Giesen *et al.* 2004). *System simulation modelling* that integrates a number of models to represent different components of the agroecosystem in a multi- or interdisciplinary fashion, can link either dynamically or through meta-modelling, existing system models (see Belcher, Boehm *et al.* 2004 for a review). *Multi criteria optimisation models* (using linear or non-linear programming techniques) are used in many modelling exercises given the suitability of the approach to the multi-dimensionality character of sustainable agriculture.

**The use of indicators** to measure agricultural sustainability is justified by the multi-dimensional (multi-systemic) structure of the concept as well as a recognition of the impossibility to condense sustainability into a single definition (Pannell and Glenn 2000). The role of indicators is to support the process of decision-making by monitoring certain features/aspects considered essential for gauging sustainability (Pervanchon, Bockstaller *et al.* 2002; Pannell and Glenn 2000). On the policy-makers side, assuming that an overall sustainability indicator can be constructed, some authors consider that it would be used to monitor the success of policy intervention, on the grounds that the only clearly favourable policy is the one “that improves the quantitative indicators in all categories, or at least improves some indicators without reducing others” (Peterson and Norman 2001 p. 17).

The development of *indicators of sustainability* faces different challenges for each of the three components of the concept. For the economic sustainability, the set of indicators can be relatively easy defined but collecting relevant information will be more difficult the higher the level of disaggregation wanted. Meaningful environmental indicators are more difficult to define, and the availability of relevant data may pose additional challenges. The most thorny component of sustainability is however the socio-cultural one, for which both identification

and quantification are difficult, although rural employment is seen as a good proxy (Peterson and Norman 2001).

The criticism to the use of indicators is related to the confusion of *which* indicators should be ideally used, confusion attested by the proliferation of sustainability indicators in the literature. They inevitably conflict with each other and there are no criteria or principles available for selecting among the many possible indicators or weighting them appropriately. It also is not clear how they should be weighted against competing social or economic objectives (Pannell and Schilizzi 1997). Overall, the indicators of sustainability have the disadvantage of requiring a large number of detailed information/data, while failure/difficult understanding of the complex interactions between different indicators generate more problems to their use (Stoorvogel, Antle *et al.* 2004).

However, operationalisation of the agricultural sustainability concept relies heavily on the use of indicators particularly in quantitative assessments. Some authors derive *indicators of sustainability* by first formulating the goals of sustainable agriculture (e.g. protection of resources influenced by farming practices of a given farming system), and then assigning to each goal at least one indicator (e.g. site-specific soil loss potential, nitrate balance, energy input and global warming potential of each cropping practice) (Meyer-Aurich 2004). Pannell and Glenn (2000) note that to be able to evaluate a system's sustainability "one should identify the particular distinct characteristics which are judged to be at the heart of sustainability and evaluate the system in terms of these characteristics".

The large range of operational indicators applied to measure agricultural sustainability includes *environmental indicators* (amounts of fertilisers and pesticides used, irrigation water used, soil nutrient content, depth to the groundwater table, water use efficiency, quality of groundwater for irrigation, and nitrate content of both groundwater and crops); *economic indicators* (crop productivity, net farm income, benefit–cost ratio of production, and per capita food grain production); *social indicators* (food self-sufficiency, equality in food and income distribution among farmers, access to resources and support services, and farmers' knowledge and awareness of resource conservation) (Zhen and Routray 2003). Some examples of *system level indicators* of sustainability include soil quality, greenhouse gas emissions, land rent and land use (Belcher, Boehm *et al.* 2004), crop diversification, soil fertility management, pests and diseases management, use of agro-chemicals (Rasul and Thapa 2004).

### **Sustainability and distributional effects of agricultural policies**

The concerns related to understanding the distributional effects of policy intervention should be seen in the broader context of *intra- and inter-generational equity issues* of the sustainability agenda. The central questions of the equity debate refer at (1) the degree of fairness and inclusiveness with which resources are distributed, opportunities given and decisions made, (2) the distribution of costs and benefits among the members of any system (humans or ecosystem elements), (3) magnitude of distribution (Hardi and Zdan 1997). Significant *social equity* issues include (a) poverty alleviation, (b) employment and income distribution, (c) gender, (d) ethnic and age inclusiveness, (e) access to financial and natural resources, and (f) intergenerational opportunity (UN-DSD 2001).

The strong normative belief is that policy-makers intervention is to correct market distortion and thus could shape the economic and social reality (i.e. safeguard the food supply, and guarantee income respectively) (Huylenbroeck, Lauwers *et al.* 2004). However, policy intervention is not exempted from failures; often the target is missed or new inequalities may

emerge. Most policies would aim to improve one aspect of sustainability at the expense of another one, a situation known by the economists as a “no free lunch” (Peterson and Norman 2001), and the relevant question here is whether the benefits of improvement of one area compensate for the forgone benefits in the other areas. Tangermann (2004) points out that the key distinction in understanding the effects of policy intervention is to distinguish market-distorting policies from those which less interfere with market forces. In this context, the New Institutional Economics approach could be an alternative to gain insights in the policy-induced equity and distribution issues interlinking political, rural and social systems, and markets although this approach is not easy to operationalise/quantify (Huylensbroeck, Lauwers *et al.* 2004).

### **1.3 Some empirical evidence**

Given the multiplicity of variables in terms of which equality can be judged, policy-relevant analysis should clearly (1) define its scope (as straightforwardly Sen (1992) asks “equality of what?”), (2) the way how to measure inequality (distribution), and (3) a conceptual framework of understanding its origin and implication. These three requirements/steps are closely related, each definition influencing the choice of the others two. Moreover, there is a need to maintain transparency and interpretability that the results can be reflected in the policy design.

Article 39 of the Treaty of Rome includes among the main aims provision of a fair standard of living for the agricultural community, envisaged to be achieved by increasing the individual earning of those involved in agriculture. Correspondingly, most of the economic analyses of distributional effects of agricultural policies largely rest in welfare economics, and the associated operationalisation approaches rely on constructing Lorenz curves, calculating Gini coefficients, Theil’s entropy measures or in deploying cumulative distribution function (see Sen and Foster 1997). Most authors put more accent on changes in income sources (production and revenues, calculation of payments) than on the distribution and equality themselves.

Distribution of income along the food chain and between farm tenants and land users are certainly important issues surrounding equity and effects of the agricultural support. Winters (1988) argues and an OECD (1999) study brings empirical evidence that most of the common agricultural policy support capitalised in the value of land, which in turn mean that most of the support is earned by landowners. Happe (2004) shows the effect of various modes of decoupling on farm land prices and thus on the distribution of policy between landowners and tenants. Examination of the agricultural policy support (i.e. direct payments and market price support) between farms grouped according to economic size, type of production and region in selected OECD countries revealed distribution of support following the same pattern as the output distribution, implicitly benefiting large farms the most (OECD 1999). Allanson and Hubbart (1999) using stochastic dominance approach and FADN data for two periods (1990-1991 and 1994-1995) reveal income disparities between farming sectors of the Member States (EU-12), and particularly a “income dominance” of Northern countries (with some exceptions for Netherlands and Denmark). Allanson (2005) measures the redistributive effects of agricultural policy instruments (i.e. direct payments and other grants and subsidies) as the difference between the absolute Gini indices of pre-support and post-support incomes. The results indicate that over the period 1993/94-1999/00 the provision of agricultural policy support in Scotland had only a limited income stabilisation effect.

Overall, evidence from the OECD countries reveals that in 2002, the total support to agriculture was just over US\$318 billion, of which direct producer support (PSE) represented

73.9 %, the rest being shared between general services (17.3 %) and support to poorer consumers (8.9 %) (Tangermann 2004). Moreover, of the total 107 billion euros representing producer support in 2002, 57.1 % came from consumers (resultant of higher prices due to trade protection measures) and 42.9 % were tax transfers (Tangermann 2004).

To conclude this brief review, it is clear that to date the scope of studies on equalities and distributional effects of agricultural policies has been narrowly linked only to income and “income policies”. Obviously, there is an increasing need for broadening the assessment of equality and distribution in the context of the sustainable agriculture concept. Following von Braun (2003), the analysis of distributional effects of “agricultural change” (induced by technological innovations or policies) can be extent and structured in five directions/domains:

- (a) *Land and natural resources property rights and management* that have joint effects for provision of private and public goods. It includes issues such as farm size inequality; initial distribution of land ownership and its attributes; landscape and land use patterns; access to water at low private cost in irrigated agriculture, etc.;
- (b) *Agricultural technology and research (new/biotechnologies)* impinge on productivity of agriculture and food systems and their distributional effects depend on the access of farmers to them, thus in many cases on the existence of policies which assist the adoption of advanced technologies;
- (c) *Agricultural markets and trade*. Competition conditions, security of contracts, market infrastructures and safety nets (securing farmers against price shocks and natural disasters) are the main issues relating to income distribution;
- (d) *Consumer access to health food in sufficient quantity and quality as well as to non-commodity benefits like recreational capacity/quality of agricultural landscape*. While the role of the state to stimulate production of food declines, its role might be critical in introduction of food safety standards, guaranteeing food quality schemes, providing incentives for investments in capacity strengthening to improve food safety standards;
- (e) *Rural public goods*. It refers to the claim to reconnect agriculture with rural development; i.e. redefining and reasserting the socio-economic role of agriculture as a one of the major agents in sustaining rural economies and cultures. It might require redistribution of policy entitlements, changes in institutional arrangements including decentralisation of policies.

More important, the implementation of policies related to sustainability is directly influenced by farmers’ own rationality, i.e. own values, perceptions, ability and willingness to adopt sustainable farming practices shaped under the influence of external factors, as institutions, social relations and signals (Schoon and Grotenhuis 2000). Agricultural policies need to be targeted to specific groups rather than being delivered in one single package of policy instruments. The needs of all interested parties should be reconciled if adoption of sustainable farming practices is to occur. Without support from farming communities it is unlikely that the agricultural sustainability agenda will be successfully implemented. Moreover, knowledge of motivations of farmers that guide their decision making process is important for anticipating their reactions to the implementation of agricultural policy.

## Note

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## **Part II:**

# **Approaches to Policy Modelling**



# CAPRI-DYNASPAT - extension of the CAPRI modelling system and incorporation of New Member States

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## THE CAPRI-DYNASPAT PROJECT

### Aims and background of the project

CAPRI-Dynaspat stands for “Common Agricultural Policy Regional Impact – the Dynamic and Spatial Dimension”, a Specific Targeted Research Project co-funded by DG-RSRCH in the 6<sup>th</sup> EU framework program from 3/2004 until 3/2007<sup>1</sup>. The main objectives of the project according to the project tender and the study contract are as follows:

- “Research is to develop tools and methodologies in order to evaluate ex-ante intervention measures covering all EU Member States ... Research will identify, at the regional level, the effects of EU policies, and in particular the CAP, on income, employment, production structure, production intensity, and land use.”
- “Research will identify, at the regional level, the effects of EU policies, and in particular the CAP, on income, employment, production structure, production intensity, and land use.”
- “A second objective would be to integrate tools for environment and landscape assessment or, where appropriate, elaborate the interface between such tools”.
- “Research should, as much as possible, make use of existing modelling work.”

The main instrument used in CAPRI-Dynaspat is the CAPRI modelling system described shortly in the next chapter<sup>2</sup>. The project introduces such changes and improvements in CAPRI which ease meeting the objectives mentioned above. These features will be described later in some detail, with a focus on implementation for the new Member States. Additionally, as asked for in the objectives, the CAPRI modelling system is applied for impact assessments of

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<sup>1</sup> Many additional information regarding the CAPRI-Dynaspat project beyond was it presented in the paper including preliminary results including presentations and working papers can be found at the project web page: [http://www.agp.uni-bonn.de/agpo/rsrch/dynaspat/dynaspat\\_e.htm](http://www.agp.uni-bonn.de/agpo/rsrch/dynaspat/dynaspat_e.htm)

<sup>2</sup> The reader interested in further detail should refer to the CAPRI web-page ([http://www.agp.uni-bonn.de/agpo/rsrch/capri/capri\\_e.htm](http://www.agp.uni-bonn.de/agpo/rsrch/capri/capri_e.htm)) where an up-to-date full documentation of the model can be found.

EU policies including data base, baseline and scenario work in regular intervals during the project's lifetime.

### **Background: the CAPRI modelling system**

CAPRI, the acronym for “Common Agricultural Policy Regional Impact” is an agricultural sector model linking non-linear mathematical programming models for ca. 250 regions<sup>3</sup> of the EU-25, Norway, Bulgaria and Romania with a global market model for agricultural products. In the regional models, agricultural supply of 39 crop and 19 animal activities covering all agricultural activities defined in national accounts, as well as feed and further input demand, are modelled by maximising market revenues plus premiums minus a non-linear cost function under a limited number of constraints: land availability, policy (quotas and set-aside obligations) and feeding restrictions. The supply component of the model allows for an explicit representation of the different (partially coupled) payment schemes of the CAP, differentiating between production activities and regions. The quadratic cost function is equivalent to the one typically employed in applications of ‘Positive Mathematical Programming’ (PMP; (HOWITT 1995)). Contrary to linear programming models, the non-linear formulation ensures a diversified crop mix and smooth supply response observable at the aggregate level. It implicitly captures changes of marginal costs associated with changing activity levels due to capacity constraints or rotational effects. They also can be considered as a reduced form representation of risk and aggregation errors (Heckelei 2002).

The regional supply models take prices as given. In order to achieve product price endogeneity of the overall system, the supply models are linked to a market model. This market model is a global spatial multi-commodity model based on the ‘Armington assumption’ (Armington 1969). It covers 40 products representing all marketable outputs delivered by the activities included in the regional supply models as well as oils and cakes from oilseeds, sugar and seven types of dairy products (butter, skimmed milk powder, cheese, fresh milk products, cream, concentrated milk and whole milk powder). Distinguishing imports by origin and exports by destination, the Armington assumption allows to model bilateral trade flows between 18 countries or country blocks in the world<sup>4</sup>. These trade flows are affected by a complete set of import tariffs expressed in ad valorem and specific terms, most Tariff Rate Quotas (TRQs) and trade preferences given by the EU, flexible levies for cereals<sup>5</sup> as well as sugar and rice safeguards<sup>6</sup>. Export subsidies and changes in intervention stocks in the EU are modelled endogenously as a function of world and EU market prices, and EU market and administrative prices, respectively. Flexible functions satisfying microeconomic conditions ensure that the models reaction are in line with economic theory and allow for a consistent welfare analysis.

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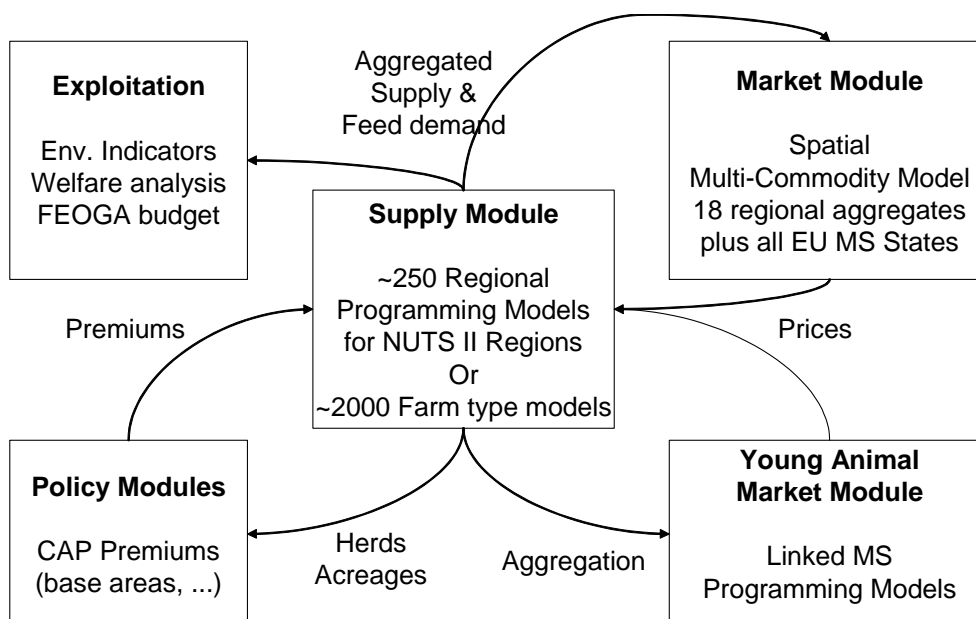
<sup>3</sup> These regions correspond to the NUTS 2 EUROSTAT nomenclature.

<sup>4</sup> Trade blocks in the model are: EU-15, EU-10, Bulgaria & Romania, rest of Europe, USA, Canada, Mexico, MERCOSUR countries, rest of South America, India, China, Japan, rest of Asia, Australia & New Zealand, Mediterranean countries, least developed countries, ACP countries and rest of the world. The EU-15, EU-10, MERCOSUR and Mediterranean countries feature behavioural equations at single country level.

<sup>5</sup> The flexible levy or tariff is equal to 155% of the intervention price minus the c.i.f. (cost, insurance and freight) import price as long as the resulting tariff is below the WTO bound rate.

<sup>6</sup> Data on import tariffs are obtained from the Agricultural Market Access Database ([www.amad.org](http://www.amad.org)) and aggregated to the product and regional coverage of the model. The final tariff is the result of a simple formula: sum of an unweighted arithmetic average (50 %) and an import weighted average (50 %) of all tariff lines related to one product category in the model.

**Diagram: Overview on modules in the CAPRI's economic model**



The supply and the market modules of CAPRI are linked by an iterative procedure which delivers in each iteration prices from the market model to the regional supply models. Those are solved at these fixed prices and the resulting supply and feed quantities are then returned to the market model and a new set of prices is generated. This procedure is repeated until convergence of prices and quantities is achieved. Additionally, in between iterations, CAP payments are adjusted in an additional 'premium module' to comply with value or physical ceilings as notified by the Commission. Linked to the results of the premium module and the market module is a module which calculates the complete first pillar of the FEOGA budget ex-ante<sup>7</sup>. Finally, iterations also ensure that young animal markets at EU level are cleared by a price mechanism which links raising and fattening animal activities (e.g. sows and pigs for fattening).

## Land allocation

In CAPRI, the total agricultural area in each of the NUTS 2 regions is divided into arable and grassland, which are considered fixed resources and are consequently not changed in simulation runs. Crop activities, including set-aside and fallow land, compete with each other for this limited resource, such that land is distributed according to the activities' contributions to the objective function under the explicitly modelled agronomic and economic constraints. The list of crop activities exhausts the whole Utilisable Agricultural Area (UAA) and covers vegetables, fruits, olive oil etc. Nurseries, flowers and a residual activity -mainly pharmaceutical crops and some residual from the Economic Accounts- are trend forecasted

<sup>7</sup> The CAPRI modelling system is maintained, applied and further developed by a network of European researchers co-ordinated by the Institute of Agricultural Policy, University Bonn, and mainly funded by EU research projects or directly by EU Commission services. A reference version of the model along with its documentation, underlying data base and exploitation tools is distributed to the network during yearly training sessions. Further information can be found at: [http://www.agp.uni-bonn.de/agpo/rsrch/capri/capri\\_e.htm](http://www.agp.uni-bonn.de/agpo/rsrch/capri/capri_e.htm)

and kept constant in simulation. Under the old Agenda 2000 policy package, obligatory set-aside is linked through additional constraints to Grandes Cultures. All crop activities are modelled with a high and low yield variant with their own set of input and output coefficients and resulting gross margins. Yields at regional level are hence endogenous and react to changes in market and policy incentives. Even with grass land areas fixed, the model still might change the amount of grass produced by changing intensity.

For all activities, marginal revenues, consisting of market revenues plus premiums per hectare, are equilibrated with marginal costs at the optimal solution, including opportunity costs of exhausted resources. In the case of land, shadow prices are set to rental prices in the base period when available or are derived from the average profitability of the crop rotation. Here, the model specification differs from the typical PMP approach, where shadow values of limiting resources are set arbitrarily in a first step based on an auxiliary restricted linear program (Heckelei et al. 2005). The linear and non-linear cost parameters are calibrated such that observed activity levels satisfy conditions for optimal land allocation given the shadow prices of land and prior information on supply elasticities.

### **Implementation of premium schemes**

The model distinguishes about 25 different premium schemes of the CAP, including the options introduced with the Luxembourg compromise 2003. These schemes differ regarding the payment basis (per hectare, per head, per slaughtered head or per production unit), the list of eligible activities and the type of premium ceilings (expressed either in physical and/or value limits). The rates paid may vary across Member States or even NUTS 2 regions depending e.g. on historic yields or, as in case of the Luxembourg compromise, on premium envelopes based on historic volumes. All premiums are then attributed to specific production activities and may hence be interpreted as activity specific factor subsidies paid either per hectare of land for crop activities or per animal/slaughtered head for animal production activities. So technically, premiums are generally ‘not decoupled’. However, the impact on land allocation depends on the differentiation of premiums between production activities. In the case of a regional flat rate premium, no differential impact on profitability of activities per hectare would be exerted.

The different premiums paid to the activities are proportionally cut if ceilings of the relating scheme are exceeded. If, for example, up to 1000 animals could receive premiums under a certain scheme, and the actual herd size is 2000, every of the 2000 animal receives 50% of the declared premium. Up to an actual herd size of 1000 however, all animal would benefit from the full declared premium. A herd below 1000 animals implies that the budget of the scheme is not exhausted.

Despite its richness in detail, a certain aggregation bias of this approach has to be discussed. First of all, the effect of premium ceilings can only be evaluated at the lowest regional breakdown of the model, currently NUTS 2 regions<sup>8</sup>. Secondly, further farm specific conditions for premium modulation are not implemented, for example regarding stocking densities. In case of stocking density restrictions, we would expect ‘shadow premiums’ attached to fodder area if we solved a (binary) linear programming problem for a single farm ex-post. These shadow premiums would capture the fact that animal premiums are paid (or increased) if a certain fodder area is existent. That effect is mimicked in CAPRI by re-

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<sup>8</sup> A version of farm types inside the NUTS 2 regions is currently in revision and planned to be operational again in autumn 2005.

allocating in a rather ad-hoc manner certain percentages of the animal premiums to fodder producing activities). And thirdly, due to the proportional cut of premiums in case of exceeded ceilings, the model is not able to capture a farm specific ceiling which lets the marginal premium drop to zero. This drawback should be kept in mind when looking at the results of the Luxembourg compromise for such countries where the so-called farm premium was implemented leading to the number of hectares eligible being generally larger than the base area. In this case, we would expect the rent to go rather to the premium entitlement, and not to land. In CAPRI however, the premium paid per ha would be proportionally reduced to satisfy the value ceiling, and would thus affect the land rent.

### **Further components of the system**

Albeit the economic core model is often seen as synonym for the CAPRI system as a whole, the system comprises further equally important components. First of all, the CAPRI data base, along with the concepts, methods and modules to update and maintain it, is key for using the economic model. The CAPRI data base is wherever possible sourced by official and harmonized sources available for all Member States; econometrically based methods allow for mutual consistency of the input data and help to fill gaps. An important feature of the data base at regional level are input and output coefficients which are mutually consistent with basic agricultural statistics and the Economic Accounts for Agriculture, allowing to calculate environmental and income indicator for individual agricultural production activities in a comprehensive and consistent manner.

Further significant modules linked to economic core model deal with post-model analysis, calculating environmental or farm income indicators, the elements of an economic welfare analysis or the FEOGA budget based on the endogenous economic model's results. All these findings can be explored interactively by exploitation tools as maps, graphics or tables which are transparently linked to the system. Consequently, the software underlying the system is a further important and integral component of the system: all numerical parts are written in GAMS, whereas the Data Base Management System and the user interface are realized in Higher Programming Languages. Finally, the system comprises the devoted developers and users of CAPRI. Success of the system depends crucially on the efficient interaction of the different components, and hence on overall system design.

### **Projects around CAPRI**

The first version of the CAPRI systems was developed from 1997-1999 (project EU FAIR3-CT96-1849, [http://www.agp.uni-bonn.de/agpo/rsrch/capri/caprip4\\_e.htm](http://www.agp.uni-bonn.de/agpo/rsrch/capri/caprip4_e.htm)), and first scenario results were presented end of 1999 when the system became operational (Britz, EDT 2000). A follow up project called CAP-STRAT9 ("Common Agricultural Policy Strategy for Regions, Agriculture and Trade", 2001-2004 replaced the rather simple global the net trade model from the first project by a global spatial Multi-Commodity Model, improved the way animals were modeled and contributed scientifically especially to the further development in the field of Positive Mathematical Programming. Equally, the CAPRI system was thoroughly validated during that project and applied for policy impact analysis, and its data base regularly updated. End of 2000 until beginning 2002, a project financed by DG-ENV added new environmental indicators to CAPRI and provided a first prototype of a farm type module (Britz, Helming and Perez 2003).

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<sup>9</sup> [http://www.agp.uni-bonn.de/agpo/rsrch/capstr/capstr\\_e.htm](http://www.agp.uni-bonn.de/agpo/rsrch/capstr/capstr_e.htm); BRITZ, (ED)., 2000.

In 2004, the CAPRI-Dynaspat project started, a so-called “Specific Targeted Research Project” (STREP), which will ensure that each year until 2007 the data base is updated, a baseline produced and policy impact analysis performed, on one hand., and that the model is further developed, on the other hand. An important task of the CAPRI-Dynaspat project is to expand the system to EU25. In parallel, CAPRI’s economic core model will be enhanced by adding a recursive-dynamic simulation mode, and new environmental indicators will be developed relating to landscape and N and C fluxes based on a spatial dis-aggregation of results for NUTS II regions and the consecutive link to bio-physical models. Further, a labor module will be added and a new indicator for non-renewable energy use in agriculture developed.

The projects mentioned so far were all centered on CAPRI. Two other STREPs use CAPRI in a conjunction with other approaches and other tools to analyze possible trade liberalization steps between the EU and its Mediterranean neighbors (EU-MedAgPol10, 2004-2007,) and the EU and the South American countries (EU-MercoPol, 2005-2009). In both projects, the main advantage of using CAPRI is its global trade component and its feedback with the regional modules. Further on, CAPRI provides the agricultural market model in the so-called “Integrated Project”<sup>11</sup> SEAMLESS<sup>12</sup> (“System for Environmental and Agricultural Modelling; Linking European Science and Society”, 2005-2009) which analysis agriculture and its linkages with the environment across scales from global to plot level. In the context of SEAMLESS, the CAPRI farm type module will be further developed and a module for structural change added to the system. Equally, CAPRI will be integrated in the overall modeling framework, which includes linkages to GTAP and bio-economic and bio-physical models. In parallel, CAPRI is used as the agricultural module in SENSOR “(Sustainability Impact Assessment: Tools for Environmental, Social and Economic Effects of Multifunctional Land Use in European Regions”, 2005-2009, <http://www.sensor-ip.org>), another “Integrated Project”, looking at land use across sectors as agriculture, forestry, tourism, energy and transport.

Since end of 2003, DG-JRC in Seville finances a study project based on CAPRI where the farm type module is completely updated and enhanced to analyze different aspects of farm sustainability, at the same time contributing to improved documentation of the CAPRI system and to training activities for Commission Services.

Many different institutions have over the years contributed to projects involving CAPRI, some using own funds for specific analysis as SLI in Lund/Sweden; others acquire additional funds as NILF in Norway/Sweden. One of the strategic objectives for CAPRI is to increase the use of the model at regional and national level in the years ahead by enlarging the CAPRI network and finding new clients for model results, both policy makers and other stake holders. There had been already promising signs from agro-industrial companies in Germany, as well as contacts to several national agricultural ministries.

## **Access to CAPRI**

Resulting from the fact that the major part of funds spent on the development and maintenance of the CAPRI system so far had been provided by DG-RSRCH, the CAPRI

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<sup>10</sup> <http://eumed-agpol.iamm.fr>

<sup>11</sup> Integrated Projects” bring typically more then 30 partners together featuring EU funds above 10 Mio € whereas the STREPs mentioned above are supported with around 1 Mio € for the four to eight partners involved.

<sup>12</sup> <http://www.seamless-ip.org>

system is treated by its developers as far as possible as a public good. Basically, any interested researchers may download CAPRI without a fee. An important cornerstone in that process was the new data policy of EUROSTAT, which opened up its data bases to the public for free. Given the complexity of a system as CAPRI, free access to software, data and documentation are not sufficient for wide-spread use as a formal introduction and training are necessary for successful application and exploitation. The latter are achieved by regular so-called training sessions of several days for the CAPRI users' network. These sessions cover teaching on and presentations of methodological and technical aspects of the CAPRI system, and their application in group work on actual scenarios. During the training sessions, the newest available master version of the system along with the data base, software, documentation and training material is distributed to the participants. In recent years, members from different DGs took part in CAPRI training sessions.

## **POLICY RELEVANCE OF CAPRI-DYNASPAT AND RELEVANCE FOR NEW MEMBER STATES**

The CAPRI modeling system was designed from the beginning as a tool for policy support, mainly directed towards DG-AGRI and DG-ENV, and focusing on ex-ante impact assessment of the different CAP instruments. CAPRI's policy relevance is most clearly visible from the fact that the system is since 2004 operationally installed in DG-AGRI and was recently used to introduce a regional perspective in DG-AGRI's outlook work 2005 (EU-Commission 2005). DG-AGRI initiated the use of CAPRI for an ex-ante impact assessment of the reform proposals in the context of the so-called "Mid Term Review" of Agenda 2000 in 2002 (EU-Commission 2003). The herd size projections stemming from the CAPRI baseline are input to the "Clean Air for Europe" baseline work, and long-term projections involving CAPRI are used by the European Environmental Agency for its "State of the Environment and outlook report 2005". There are many more examples presented below in the section looking at example applications.

What are the reasons of the relatively wide spread use of CAPRI in agricultural policy impact analysis in the EU? First of all, CAPRI allows to present in a rather direct manner the different instruments of the CAP (premiums schemes, quotas, set-aside, market interventions, export subsidies, support to consumers and processors, border protection etc.) thanks its regional breakdown and rather dis-aggregated list of products and activities. Secondly, CAPRI's rather unique transparent link of regional agricultural (or even farm type) models covering all of EU25 and all agricultural activities with a global market model for agricultural products captures the highly interdependent way the instruments of the CAP interact at different scales, in different markets and regions, both inside the EU and at global scale. The combination of these two features renders the system suitable for impact analysis of a wide range of different scenarios. Thirdly, CAPRI allows assessing policy impacts on many different aspects as crop rotations, herds, production, input use, farm income, agricultural prices, demand and trade flow, as well as on consumer welfare, the FEOGA budget and a range of environmental indicators allowing for impact assessment in line with the "multi-functional model" of European Agriculture. Fourthly, CAPRI's data bases are sourced wherever possible of official, harmonized Pan-European data sources, which eases maintenance and updates of the system, and as well as communication with policy makers. Fifthly, transparently linked exploitation tools for maps, graphics and tables allow for an easy and efficient analysis of results. And not at least, CAPRI is based on a scientific sound and innovative concept and applied and developed by a lively network of researchers from almost all EU Member States, many with a long-standing experience in quantitative policy support.

The relevance for the New Member States may be seen from three perspectives. The first one is that of Pan-European coverage as any tool for policy impact analysis at EU level is expected to represent all EU members, and accordingly, CAPRI applications shall cover also the NMS, and their relations with the rest of the Union. The CAPRI-Dynaspat project with its work package integrating the NMS ensures that impacts on and of the NMS are properly taken into account in any impact analysis. That perspective is especially important for stakeholders involved in policy impact analysis at Pan-European level as the EU Commission.

The second perspective refers to the regional and national stake holders, both in the old and new Member States, trying to learn about impacts of the current CAP or its possible future changes on specific regions or markets. They clearly profit from a layout as found in CAPRI where scenarios are analyzed in a coherent way across Member States, regions and markets. Accordingly, results can be easily compared between Member States or regions so that cost and benefits/ effects/ impacts of a policy package can be evaluated for a specific region and Member State in the light of forecasted changes in any other European region or market.. While individual stake holders may quite often lack resources, tools and experience for a comprehensive policy impact analysis, results from CAPRI will most often offer sufficient details for assessments and interpretations from the specific perspective of the stake holder. That argument may hold especially for the NMS where structural changes during the last two decades affected the statistical system and research institutions. Bridging that gap while delivering important inputs for policy analysis requires that researchers and stake-holders gain access to the results of tools as CAPRI, which indeed is a declared aim of CAPRI-Dynaspat.

Compared to the old Member States, tools for policy impact analysis in a market oriented environment and experiences in their application are less common in the New Member States., Thus, the value of new instruments covering the NMS is higher compared to the old Member State, where often regional and national models and tools for agricultural policy impact analysis are available. Thus, the third perspective regarding the policy relevance of CAPRI-Dynaspat for the NMS rests in the capacity of CAPRI (database, baseline, exploitation tools, documentation, and training sessions) to provide stakeholders and analysts in the NMS with a quite powerful instrument for national and regional impact analysis of agricultural and agri-environmental policy instruments.

However, Pan-European harmonized approaches as CAPRI covering the whole of agriculture come at a cost as regional, market or product specificities can only be captured up to a certain detail. Far more detailed data might be available for specific regions, products or processes in agriculture as those found in harmonized Pan-European statistics, and equally, more suitable methodological approaches might be available for (bio-)economic modeling when concentrating on individual regions, products or processes. A promising approach in that field is the integration framework of SEAMLESS project in which various proper to scale model will be linked. That will allow putting the supply response in CAPRI on far more solid and detailed bio-economic base, at least for important farm types.

## **INCLUSION OF NEW MEMBER STATES, ROMANIA AND BULGARIA**

As mentioned above, the inclusion of the New Member States is a deliverable in the context of the CAPRI-Dynaspat project. Indeed, a specific work package tries not only to expand model and data base eastwards, but as well the network of CAPRI users. Since middle of 2004, a first EU27 version is operational, and the latest release of CAPRI distributed end of August 2005 to the CAPRI network captures now EU25 plus Romania and Bulgaria. Norway is since several years included in CAPRI.

The inclusion of the new Member States has posed some new problems. Whereas for the old Member States, long time series for all major data are available, data on the New Member States found in Harmonized Pan-European data sources are scarce and sometimes of questionable quality. Some important time series could be backcasted based on time series from FAOSTAT with comparable definitions. Partners in the different NMS are since 2004 comparing the data available at EUROSTAT with national and regional statistics to locate possible data problems. In parallel, data from other projects are exploited for CAPRI-Dynaspat. Fortunately, many bio-physical coefficients as e.g. requirement contents of feeding stuff used in CAPRI are global and can be thus taken over for the NMS directly. However, there are some crucial data at national and regional level, e.g. stable systems, currently missing for the NMS where assumptions had to be made. The so-far missing FADN data for the NMS have not allowed estimating parameters of input demands, so that average parameters for the old Member States must be used instead.

On top, the construction of the base line or reference run for the NMS is far more demanding compared to the old Member States as the speed of change in agriculture or infrastructure is much faster. Here, CAPRI works closely with Commission services to link the CAPRI baseline as far as possible to the outlook work of DG-AGRI.

## SCENARIOS AND RESULTS

Since it became operational in 1999, CAPRI was applied to a range of policy scenarios covering the most important agricultural reform proposals in the public discussion. The reader is reminded that the system typically deals with ex-ante impact assessment, i.e. with “what-if” questions regarding implementation of policy in the future compared to the current law book.

The first scenarios ever analyzed were related to the so-called “Agenda 2000” reform, decided upon shortly before the first CAPRI project ended (Britz 2000). The scenario results were presented to DG-AGRI and later at conferences (e.g. Britz and Heckelei 2000), and aggregated results were in line to those found by well-established economic modeling systems, however, the unique and quite interesting contribution of CAPRI was the regional perspective of the results. In the following year, researchers based at SLI in Lund, Sweden, applied CAPRI to different options for a CAP milk market reform (Jansson 2002), and results were shown at international conferences as well as to policy makers at national and EU level (e.g. Jansson and Britz 2002). In 2002, a range of possible outcome of the WTO Doha round was analyzed with CAPRI and presented at conferences (e.g. Britz, Wieck and Perez 2003c), following the integration of the improved global market model in the context of the CAP-STRAT project. Recently, CAPRI was again used to look at WTO trade liberalization proposals and results *inter alia* presented at a conference hosted by DG-JRC in Seville in June 2005 (Britz et al. 2005). In some of these applications, not only policy but different exchange rates were analyzed as well.

In 2002, scenario analysis related to the so-called “Mid-Term Review” proposal started, and is ongoing since then. The original work was initiated by DG-AGRI, and these first results were published by DG-AGRI later together with results obtained by other models (Britz, Wieck and Perez 2003a). In 2003, results then based on a revised proposal and later on the final “Luxembourg” compromise were presented at different conferences and workshops (e.g. Britz and Perez 2003; Britz, Wieck and Perez 2003b) or used as input in other projects (e.g. Henning et al. 2004, EPSON project team 2003). The results were regularly updated to keep track of the decisions of the Member States regarding the national implementation of the MTR policy package.

In 2002 and 2003, CAPRI was applied along with other models and tools in a study looking into reform options for the EU sugar market (Henrichsmeyer et al. 2003), which served DG-AGRI as input in the discussion finally leading to the proposals made for a reform of the sugar market in 2004 by Commissioner Fischler and recently by Commissioner Boel. The original results obtained by that study were for the eyes of the client only, but the latest proposal which was as such not comprised in the study has currently be analyzed in the context of PhD study, and results obtained were presented on different conferences (e.g. Adenäuer et al. 2004).

Over the years, there had been many other applications, often in quite innovative fields as Pan-European tradable permits for Green House Gas Emission (Perez 2005) or the evaluation of a Europe wide compulsory insurance scheme against animal diseases (Jansson et al. 2005). The different scenarios analyzed and the results obtained, along with the specific perspectives found in paper and presentations when looking at results, underline that CAPRI is indeed a multi-purpose system to analyze the agricultural and agri-environmental measures for the EU as well as agricultural border protection at global scale. In parallel they hint at the fact that the usage of CAPRI could clearly be further expanded, where proper documentation, training and increased visibility in both scientific journals and the general press are key in gaining new clients and users and enhanced usage of the system.

It is clearly impossible to include results from all the scenarios discussed above. Therefore, illustrative results from a recent analysis of the Luxembourg compromise will be quickly discussed in the following.

### **Selected results as an illustration**

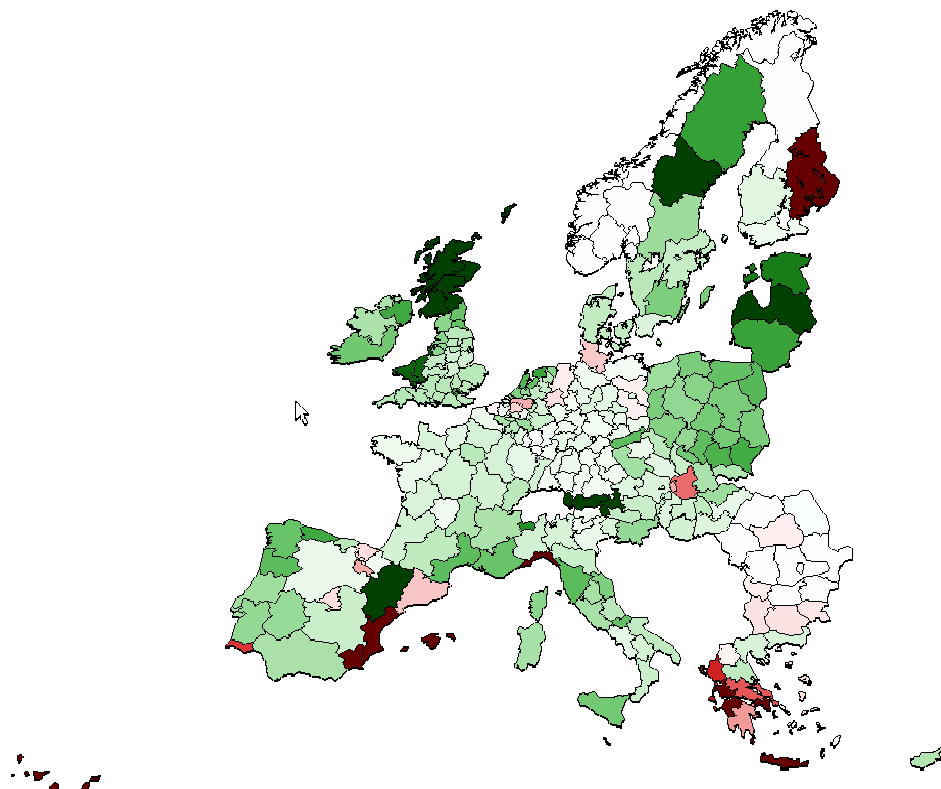
To illustrate typical, selected results from implementing either Agenda 2000 or the 2003/2004 CAP reform package in the year 2012 will be discussed. As theory suggests, decoupling payments should reduce dead weight losses, and indeed, net welfare for the CAP reform package for EU25 is 1.8 Bio € higher compared to Agenda 2000, with gains for the agricultural sector (+1.6 Bio €) and the processing industry (+1 Bio €) and a loss of purchasing power for consumers of around -1.2 Bio € as agricultural prices increase. The tax payer saves about 0.5 Bio € as costly exports with subsidies and market interventions are reduced. The positive effect stems from the fact that agricultural producers can stop producing now where they had under Agenda 2000 part of coupled payments to cover production costs. That can be seen from the fact that agricultural input costs are reduced by -3.6 Bio € whereas the output value of agricultural drops by -2.8 Bio € only.

Main effect in crop production are reduced cereal areas (-1.8 Mio ha or -3.3% less), offset by more fodder production on arable land (+1 Mio ha) and more idling land (+0.9 Mio ha). Areas of all cereals drop, but durum wheat with its rather higher support levels under Agenda drops by -16%, the reduction for the other cereals are in -2-4% range. The change in cereal production of -2.2% is below the change in areas as durum yields are below the average cereal yields. The reduced production quantities of -6.6 Mio t let prices increase by +1.4%, however, the price increase is dampened by reduced feed use of -1.5% or -2.5 Mio t and increased imports of +2.5 Mio t. Increasing prices let EU exports drop by -6 Mio t. In animal production, main effects are reduced number for suckler cows (-3.9%), bulls (-6%) and heifers for fattening (-3%) as well as sheep and goat for fattening (-2%).

The changes in the production patterns decrease negative externalities in agriculture, surpluses of nitrate (-0.6%) and phosphate (-1.3%) are reduced, ammonia (-0.9%) and methane emission (-1.5%) drop so that the emission of CO<sub>2</sub> equivalents from agriculture

decreases by about -1%. In the overall view, that underlines that the latest CAP reform was indeed a step in the right direction. But where are the changes taking place?

The map below shows changes in cereal areas. No change is shown in white, greenish colors indicate reduction whereas regions in red show increase. Bigger reductions are found in marginal areas as in Ireland and Northern U.K, but as well in the Mediterranean and in the new Member States, a clear indication that Single Area Payment scheme was a favorite option for them as it prevented an orientation towards policy supports instead towards market signals.



## **WHAT NEW FEATURES IN CAPRI-DYNASPAT AND HOW TO IMPLEMENT THEM FOR THE NEW MEMBER STATES?**

The new features from CAPRI-Dynaspac can be roughly broken down in three categories. The first one relates to improvements of the economic core modeling system, and captures the new recursive-dynamic simulation mode, and clearly, the expansion to the new Member States. The recursive-dynamic feature will allow impact analysis based on time series of results and capture the effect of a constantly changing policy, social and economic environment of farming by an adjustment cost approach. It will be fully operational for the NMS, but given rather short time series and the strong changes experienced in the last decade in EU10, econometric estimation of the parameters underlying the adjustment cost approach will be far more demanding than for the old ones. Accordingly, we may need to use Bayesian techniques, eventually using results for the old Member States as a priori information.

The second category relates to the labor and energy module. The labor module will develop a Markov-Chain based component to forecast the agricultural labor force, taking into account the age structure of farmers and workers along with relations between agricultural and non-agricultural labor markets. For EU15, the estimation can be based on data from Farm

Structure Surveys available for several years. It is not yet clear what data could be used for the NMS, borrowing parameters may again be the only feasible option. Another part of the labor module relates to the estimation of activity specific labor needs and exploits econometrically the FADN sample. First FADN data for the NMS are now going to be released with the chance to access and exploit these data before the projects end. The energy module is based to a large on rather detailed engineering information, e.g. relating to machinery and building stock. Data gathering has just begun, but there are promising signs that at least for some of the NMS, such data are available.

The third category of new features relates to the spatial dis-aggregation of results for administrative units (about 250 Nuts II regions for EU27 and Norway) to rather small so-called Homogenous Spatial Mapping Units (in total about 25.000 for EU15) (Britz, Kempen and Heckeleei 2005). The dis-aggregation procedures is based on statistical estimations using soil, elevation, climatic and land use data, especially the rather detailed information from the so-called LUCAS surveys. Whereas most data are available both for EU10 and EU15, the first LUCAS survey for the NMS will be take place after the end of the project, so that certain parameters for EU10 regions must be based on those obtained for EU15 regions which similar characteristics regarding e.g. soil and climate.

Summarizing, data availability will in some cases restrict the analysis for the NMS, but all features in CAPRI implemented by the CAPRI-Dynaspat project will be implemented at Pan-European Scale.

## CONCLUSIONS

Are projects as CAPRI-Dynaspat useful to support policy making of the EU-Commission, especially when looking at the NMS? The researchers involved in such projects certainly believe that they are and the paper tried to document it. The policy makers' perspective will be presented in other papers, but from the researcher's perspectives there are several pros to be mentioned. The research funds of the EU commission promote projects which are policy relevant, link European researchers and at the same time evaluated by scientists. More specifically, the instrument "Specific Targeted Research Project" let researchers and decision makers or those preparing the decisions collaborate on specific policy questions.

A first advantage compared to many possible funds or promoted instruments rests in importance put on policy relevance, letting researchers leave their ivory towers and employ existing and develop new knowledge or tools for the benefit of society. A second one is linked to the Pan-European character of these projects, which exploit the richness of the European research scene.

Specifically for the new NMS, it is important that not only results for the new NMS are generated and analyzed, but that researchers from the NMS are involved in the process, both to increase the quality of results and to improve their integration into the European research community. It is equally clear that methods cannot be applied in a uniform way for old and new Member States. Firstly, data limitations for the NMS often require amendments, specifically for econometric applications. Secondly, structural change in NMS follows a speed and pattern often not found in old Member States and thus asks for innovative approaches and solutions.

## Note

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# **Decoupling of direct payments: an application of the AROPAJ model projecting regionally differentiated impacts on the EU-15 farming sector (preliminary results)**

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## **Abstract**

*The objective of this paper is to study the effects of the last CAP reform concerning decoupling of direct payments decided in the framework of the Luxembourg agreement. We present the preliminary results of the AROPAj model part of the GENEDEC FP6 project. Some improvements of this model were necessary to handle the new scheme of agricultural subsidies. Data from the FADN were used to construct farm-groups and to implement the model. Simulation results show a significant shift of the shadow costs of land when subsidies are decoupled.*

**Keywords:** farming systems, modelling, mathematical programming, decoupling, land shadow costs, GENEDEC project.

## **1. Overview of the GENEDEC project, the CAP reform, and entailed models**

**The GENEDEC project**, financed by the European Commission (EC) (call FP6 – STREP 2004-2007), has been designed to assess the socio-economic and environmental impacts of decoupled direct payments as decided in the framework of the Luxembourg agreement on the common agricultural policy (CAP) reform.

The aim of the GENEDEC project is to gain insights into the workability, the efficiency, and the impact of various decoupling scenarios, so as to provide the EC with recommendations and alternative options for further improvement of the CAP. In addition, the project tackles environmental concerns since the modelled farming activities are linked to environmental indicators. In this regard, cross-compliance and second pillar policy measures should be included in the analysis. The study of the possible socio-economic consequences for some territories and for the food chain will complete the upcoming quantitative analysis.

The strength of the GENEDEC project is the coverage of the whole European Union (EU) at various levels of analysis ranging from farm to the Member State level, keeping in mind that the analysis of new Member States depends on the timely availability of data. Most of the models involved in the project are based either on linear programming or positive mathematical programming. These existing models have been developed to handle quotas, premium entitlements, and land markets. Furthermore, models and software have been harmonised to facilitate the comparison of results as well as their aggregation at the sector level or other scales such as regional, state or EU ones.

Linear programming models, and recently and more specifically, mathematical programming models (MP), are popular in agricultural economics, these models being particularly efficient

for assessing the change in agricultural land use in response to the change in policy tools. The large set of models based on MP that are used in GENEDEC will help us to offer to policy-makers the estimation of means and variances for a large series of agricultural economic indicators.

The Mathematical Programming AROPAj model developed at INRA-Grignon has been designated as the “core model” of GENEDEC. This choice is due to the generic and modular characteristics of the model that covers the whole EU and facilitates comparisons as well as cross-validation of the different models applied in GENEDEC.

Other models used in the GENEDEC project are dedicated to specific MSs or regions, and some of them are being extended for extra-national use. These models are FARMIS, from FAL-Braunschweig, PROMAPA from ETSIA-Madrid, and models built by TEAGASC, Parma University as well as the University of Reading. (Details about these models will soon be available on the GENEDEC<sup>1</sup> webpage). The major source of information used in the GENEDEC project is the FADN provided by the DG-AGRI, chosen because the homogeneity of information across all EU member states.

Because GENEDEC project equally aims to deliver results on changing environmental indicators, the geographical link between economic activities and physical data on soils, climate and plant phenology will need to be assessed. However, the AROPAj “core” model is based on NUTS II spatial units which do not have precise geographical references. In order to have a relevant agri-environmental evaluation of the CAP reform, a disaggregation tool that breaks down the administrative level data to a finer scale needs to be developed. Coupling the AROPAj model with an efficient disaggregation<sup>2</sup> procedure would allow for the disaggregation of the policy results to more detailed spatial units than those resulting from the use of NUTS II. This will lead to a more efficient evaluation of environmental policies. The idea behind the disaggregation procedure is to generate plausible disaggregated estimates of the spatial allocation of crops on a very fine scale. This procedure will utilise various information sources such as Land Use/ Cover Area Statistical Survey (LUCAS), Corine Land Cover maps, and information on soil and climate.

The introduction of the decoupled or partially decoupled payments as stipulated in the Luxembourg agreement has to be implemented as of January 2005 or as of January 2007 the latest. Subsidies are computed on a historic basis: the reference years being 2000, 2001 and 2002. The historic cultivated land farm area determines the number of entitlements, and the historic subsidy receipts determine the value of entitlements. Consequently, *ceteris paribus*, each farmer receives the same payment as before the CAP reform. This individual farm entitlement option results in entitlements which vary from one farm to the other. Member States can choose another option for decoupling, namely regionalised payments. In this case, in each region, each farmer receives the same payment for each unit of land farmed. At the beginning, this payment can be differentiated between grassland and arable land as well as supplemented by individual payment during a transition period.

Three kinds of payments are therefore distinguished:

- European coupled payments: these payments remain coupled for all Member States. They concern durum wheat, protein plant, rice, hops, energy crops, and starch potatoes;

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<sup>1</sup> GENEDEC : <http://www.grignon.inra.fr/economie-publique/genedec/>

<sup>2</sup> The amount of literature on spatial disaggregation in agricultural economics is not very big. See Howitt and Reynaud (2003); Kempen *et al.* (2005); You and Wood (2004).

- Re-coupled payments: some payments can be re-coupled according to each Member State option;
- Decoupled payments: milk, set aside, and extensification supports can not be re-coupled.

Mathematical programming models allow the possibility to examine different scenarios and their impact on economic systems when these scenarios are different from the past. The GENEDEC project is using pre-existing modelling tools. However, the tools used need to be improved in order to handle the enlargement of policy tools, geographical area, and up-to-date data concerning the agricultural sector.

The major source of information is the FADN, supplied by the DG-AGRI, a data source selected by taking into account the homogeneous information delivered for all Member States of the EU. The GENEDEC consortium considers the model AROPAj, from INRA, as the “core-model” given its capacity to cover the whole EU. Other models are dedicated first to specific MS or regions, and some of them are being extended for extra-national use. These models are FARMIS, from FAL-Braunschweig, PROMAPA from ETSIA-Madrid, and models built by TEAGASC, Parma University and the University of Reading. All these models will soon be documented on the web-page dedicated to GENEDEC.<sup>3</sup>

## 2 The AROPAj model

### 2.1 Farm design

The AROPAj model is based on farm-groups. It consists of a set of independent, mixed integer and linear-programming models. Each model describes the annual supply choice of a given 'farm-group' (denoted by  $k$ ), representative of the behaviour of  $\nu_k$ , real farmers. Farm-group representation has the advantage of accounting-in the wide diversity of technical constraints faced by European farmers. Each farm-group  $k$  is assumed to choose the supply level and the input demand ( $x_k$ ) in order to maximize total gross margin ( $\Pi_k$ ). In its most general expression, the generic model for farm-group  $k$  can be written as follows:

$$\begin{aligned} \max_{x_k} \Pi_k(x_k) &= g_k \cdot x_k \\ \text{s.t. } A_k \cdot x_k &\leq z_k \\ x_k &\geq 0 \end{aligned}$$

where  $x_k$  is the  $n$ -vector of producing activities for farm type  $k$ , and  $g_k$  is the  $n$ -vector of gross-margins.  $A_k$  is the  $m \times n$  - matrix of input-output coefficients and  $z_k$  is the  $m$ -vector of the right-hand side parameters (capacities). Together,  $A_k$  and  $z_k$  define the  $m$  constraints faced by farm type  $k$ .

The components of  $x_k$  include the area under each crop, animal numbers in each animal category, milk and meat production, as well as the quantity of purchased animal feeding. The gross margin  $g_k$  contains series of elements corresponding to each producing activity, which for crops gives per-hectare revenue (yield times price) plus, when relevant, support received, minus per-hectare variable costs. As the emphasis is put on the farm-type level, each farm-group is assumed to be price-taker. Thirty-two crops are allowed for in the model,

<sup>3</sup> GENEDEC: <http://www.grignon.inra.fr/economie-publique/genedec/>

representing most of the European agricultural land use related to arable land and pastures. Crop production can be sold at market price or used for animal feeding purposes (feed grains, forage, and pastures). As for livestock, thirty-one animal categories are represented in the model (27 for cattle as well as sheep, goats, swine, and poultry) .

The technically feasible production set is bounded by the constraints defined by  $A_k$  and  $z_k$  . A detailed presentation of the constraints is given by De Cara, Houzé and Jayet (2005), and on the webpage "[miraje](#)".<sup>4</sup> A short presentation is also given by Bamière *et al.* (2005). For a fast understanding of the preliminary results given at the end of this paper, it should be noted that the quasi-fix animal numbers are allowed to vary by  $\pm 15\%$  of the initial animal numbers in the corresponding animal categories.

The last important set of constraints concerns the restrictions imposed by the CAP policy instruments. Set-aside requirements, as well as milk and sugar beet quotas fall in this category. Mandatory and voluntary set-asides are accounted for, each type of set-aside being treated as a producing activity associated with the corresponding payments. The different types of sugar beet quotas (A, B, and C) are also included.

Many of the CAP policy instruments included in the model involve the use of binary or integer variables whenever producers have to face mutually exclusive 'discrete' choices.

The primary source of data is the Farm Accounting Data Network (FADN). For the version denoted by "V1\_2002" covering the EU-15, the 1997 FADN provides accounting data (revenues, variable costs, prices, yields, crop areas, animal numbers, support received, and types of farming) for a sample of slightly less than 60,000 surveyed farmers. Approximately 50,000 sample farms are included in the model, representing more than 2.5 million European (full-time) farmers. Data are available at a regional level (101 regions in the EU-15). The FADN regions are presented on the website [http://europa.eu.int/comm/agriculture/rca/regioncodes\\_en.cfm](http://europa.eu.int/comm/agriculture/rca/regioncodes_en.cfm) and differ slightly from the NUTS 2 level regions (the details of which are given on the following website [http://europa.eu.int/comm/eurostat/ramon/nuts/home\\_regions\\_en.html](http://europa.eu.int/comm/eurostat/ramon/nuts/home_regions_en.html)). Because of the annual nature of the model, sample farms defined as "*Specialist horticulture*" and "*Specialist permanent crops*" are excluded (types of farming 2 and 3 in the FADN classification). The analysis is thus restricted to the remaining population of the farmers representing annual crop and livestock farmers. This restriction is important to keep in mind when analysing the results, since the excluded farms may represent a significant share of total agricultural area for some regions.

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<sup>4</sup> MIRAJE: <http://www.grignon.inra.fr/economie-publique/MIRAJE/model/detail.htm>

## 2.2 Typology and construction of farm-groups

The last automatic data-processing step developed in the construction of AROPAj, namely typology, leads to the outcome of the classification and construction of the farm-groups. The new typology, related to FADN-2002, results in 1074 farm-groups covering the whole EU-15.<sup>5</sup> The classification of farms into farm-groups is important for many reasons. First of all, it takes into account the diversity of farming systems at the regional level better than models that rely on regional aggregates. Farm-group results can still be aggregated at the regional level, but the region itself is not modelled as one single 'big' farm. Consequently, models based on the farm-group approach are less subject to aggregation bias. Second, mixed farming systems being explicitly modelled, the farm-group approach better reflects the existence of fairly diversified agriculture.

The objective of the classification is to group the observed farms into farm-groups within each FADN region according to three criteria:

1. the average altitude (*Alt*) , by 3 elevation classes: <300 m, 300-600 m and > 600 m;
2. the type of farming (*FT*), by 14 types of farming activities proposed in the FADN; and
3. the economic size unit (*Size*), based on the potential total standard gross margin.

To ensure confidentiality, as well as the robustness of the estimations, the minimum number of observed farms constituting a farm-group has been constrained<sup>6</sup> to at least 15. However, to reduce aggregation bias it is necessary to have as high a number as possible of farm-groups in each FADN region.

The construction of farm-groups was conducted in two steps:

1. the first classification was carried out to create clusters based on *Altitude* and *FT*;
2. the second classification was based on *Size* breaking down the clusters created in the first step.

In the first classification we have introduced a hierarchy between the *Altitude* and *FT* variables requiring them to be transformed. The idea is to create a more precise distinction between the *FT* values in order to take into account the similarities and differences between the farming activities within each type. The transformation also allows for the taking into account the relative importance of *FT* and *Altitude* in the construction of clusters.

The transformation of each variable is presented in Table 1 and Table 2.

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<sup>5</sup> The construction of the farm-groups for FADN-2002 is performed by cluster analysis using the FASTCLUS procedure of SAS.

<sup>6</sup> Note that each observed individual farm in the FADN sample is associated with a FADN weight indicating its representativeness of the regional population. The weight of each individual farm that is included in a farm-group is aggregated with the others in the same group and used to extrapolate the results at the regional level.

**Table 1** Transformation of the *Altitude* variable

Elevation class	Altitude
0-300 m	10
300-600 m	20
more than 600 m	30

**Table 2** Transformation of the *type of farming* variable

Initial <i>FT</i>	<i>FT transformation</i>
14	2014
6	3006
81	4081
411	5411
412	6412
43	7043
42	8042
71	9071
44	10044
82	11082
72	12072
5	13005

The second classification is based on *Size*. The observed *economic size* shows a wide statistical dispersion. Thus, a classification according to *Size* would not be very accurate. Therefore, it was transformed into a discrete variable (“sizec”) as shown in Table 3.

**Table 3** Transformation of the *Size* variable

Size	Sizec
<7	1
[7,15]	2
[15,23]	3
[23,32]	4
[32,50]	5
[50,72]	6
[72,100]	7
>100	8

**Table 4** Land endowment estimated using FADN data

Member States	V1 (million ha)		V2 (million ha)		Variation (%)
<b>Belgium</b>	belg	1,355	belg	1,432	<b>5,7</b>
<b>Denmark</b>	dani	2,349	dani	2,437	<b>3,7</b>
<b>Germany</b>	deut	14,736	deu1	6,946	<b>-0,1</b>
			deu2	7,782	
<b>Greece</b>	ella	1,418	ella	1,220	<b>-14,0</b>
<b>Spain</b>	espa	11,816	esp1	6,729	<b>-4,1</b>
			esp2	4,601	
<b>France</b>	fra1	14,886	fra1	15,500	<b>7,2</b>
	fra2	8,086	fra2	8,542	
<b>U.K.</b>	gbre	11,360	gbre	11,647	<b>2,5</b>
<b>Ireland</b>	irla	4,014	irla	3,198	<b>-20,3</b>
<b>Italy</b>	ita1	3,881	ita1	2,430	<b>-9,0</b>
	ita2	4,414	ita2	2,768	
			ita3	2,355	
<b>Luxemburg</b>	luxe	0,104	luxe	0,130	<b>25,1</b>
<b>Netherlands</b>	nede	1,867	nede	1,511	<b>-19,1</b>
<b>Austria</b>	osto	1,882	osto	1,788	<b>-5,0</b>
<b>Portugal</b>	port	2,253	port	1,990	<b>-11,7</b>
<b>Finland</b>	suom	1,765	suom	1,889	<b>7,0</b>
<b>Sweden</b>	sver	3,228	sver	2,639	<b>-18,2</b>
<b>UE-15</b>		<b>89,415</b>		<b>87,532</b>	<b>-2,1</b>

**Table 5** Farm numbers estimated using FADN data

Member States	V1 (1000 farms)		V2 (1000 farms)		(%)
<b>Belgium</b>	belg	36,494	belg	33,770	<b>-7,5</b>
<b>Denmark</b>	dani	48,232	dani	43,591	<b>-9,6</b>
<b>Germany</b>	deut	255,510	deu1	121,701	<b>-19,8</b>
			deu2	83,241	
<b>Greece</b>	ella	273,391	ella	198,101	<b>-27,5</b>
<b>Spain</b>	espa	302,058	esp1	200,539	<b>9,2</b>
			esp2	129,420	
<b>France</b>	fra1	184,019	fra1	179,372	<b>-3,4</b>
	fra2	136,173	fra2	134,533	
<b>U.K.</b>	gbre	123,538	gbre	118,225	<b>-4,3</b>
<b>Ireland</b>	irla	128,737	irla	76,910	<b>-40,3</b>
<b>Italy</b>	ita1	250,229	ita1	114,999	<b>-37,3</b>
	ita2	346,347	ita2	125,588	
			ita3	133,362	
<b>Luxemburg</b>	luxe	1,523	luxe	1,640	<b>7,7</b>
<b>Netherlands</b>	nede	65,351	nede	51,296	<b>-21,5</b>
<b>Austria</b>	osto	79,280	osto	74,090	<b>-6,5</b>
<b>Portugal</b>	port	208,832	port	78,979	<b>-62,2</b>
<b>Finland</b>	suom	49,294	suom	42,887	<b>-13,0</b>
<b>Sweden</b>	sver	38,021	sver	39,000	<b>2,6</b>
<b>UE-15</b>		<b>2527,029</b>		<b>1981,244</b>	<b>-21,6</b>

The method of classification used here belongs to the family of non-hierarchical methods (partitioning) which produce a partition with a fixed number of classes. The objective is to gather the observations for each FADN region into farm-groups (clusters) with farms of the same class as similar as possible and classes quite separate from each other according to *FT*, *Alt* and *Size* variables. The statistical procedure involves at least four steps:

1. First of all, the choice of the number of groups  $k$  and the observations called *cluster seeds*.
2. Then, clusters are formed by assigning each observation to the cluster with the nearest seed.
3. After all observations are assigned, cluster seeds are replaced by the cluster means.
4. The previous step is repeated until the changes in the cluster seeds near zero.
5. Final clusters are constructed by assigning each observation to the nearest seed.

### 2.3. Parameter estimation

Parameters and baseline levels of variables that are systematically estimated using FADN data include variable costs and output prices, area and area shares for each crop, animal numbers, and support received. The estimation procedure is conducted at the farm-group level and uses the extrapolation factors provided by the FADN.

Tables 4 and 5 show the evolution of land and farm number related to the sub-sector covered by the model. Land does not include the activities not covered by AROPAj (namely a few industrial crops and activities characterizing the farm-types excluded by the farm-group construction).

**Table 6** Comparison between FADN and calibrated AROPAj

Land use (million ha)	V1		V2	
	FADN 1997	AROPAj	FADN 2002	AROPAj (partial)
<i>Durum wheat</i>	2,490	2,661	2,897	2,920
<i>Soft wheat</i>	13,117	12,774	13,613	12,095
<i>Barleys</i>	12,084	10,793	10,600	9,285
<i>Oat</i>	1,476	2,026	1,560	1,981
<i>Others cereals</i>	0,807	1,691	1,083	1,992
<i>Rye</i>	1,324	2,087	1,020	1,565
<i>Rice</i>	0,334	0,215	0,353	0,145
<i>Grain maize</i>	3,537	4,566	3,790	4,638
<i>Sugar beet</i>	2,064	2,056	1,925	1,970
<i>Rapeseed</i>	2,665	2,077	2,805	1,780
<i>Sunflower</i>	2,013	0,784	1,385	0,958
<i>Soya</i>	0,389	0,187	0,216	0,122
<i>Other protein crops</i>	0,137	0,272	0,051	0,140
<i>Dry legumes</i>	1,345	3,265		
<i>Fallows</i>		0,390		0,405
<i>Subsidised set aside</i>		5,788		6,115
<i>Estimated set aside</i>	5,178		6,409	
<i>Potatoes</i>	1,058	2,867	1,108	2,656
<i>Forage peas</i>	0,800	0,629	0,801	0,464
<i>Forage beet</i>	0,143	0,130	0,083	0,061
<i>Silage maize</i>	3,990	3,439	3,688	4,668
<i>Other protein forage</i>	6,772	4,194	7,511	4,431
<i>Permanent pastures</i>	24,083	24,501	24,099	25,638
<i>Other pastures</i>	3,609	2,019	2,535	1,585
<b>TOTAL</b>	<b>89,415</b>	<b>89,410</b>	<b>87,532</b>	<b>85,615</b>

#### 2.4. Parameter re-estimation for the calibration of farm-group models

The last step entails the calibration of a subset of the parameters. Calibration is used when information is lacking or is insufficiently reliable. The subset of calibrated parameters includes some of the parameters defining animal feeding requirements, lifetime of certain cattle categories, grassland yields, and maximal crop area shares. The calibration uses a combination of Monte-Carlo and gradient methods in order to minimize the difference between the observation data for each farm-group  $k$ ,  $x_k^0$ , and the optimal solution  $x_k^*$ . The calibration based on FADN-1997 and FADN-2002 highlights the capacity of the MP normative approach (normative in the sense of physical realism and rational economic behaviour) to produce results close to the “reality” built-in in the FADN data (see table 6).

#### 2.5. Implementation of policy tools in AROPAj

The evaluation of the effects of the new CAP reform ought to require only a minor modification in the AROPAj model. However, the new version of AROPAj has required, preliminarily, to re-write most of the command language instructions used to implement the maximization programmes with a new software (GAMS). The possibility of multiple

combinations of policy tools has been retained so that the major part of CAP tools is inserted into the model. For a large part, modules dedicated to CAP require binary variables that increase substantively the running time. However, the used software renders the model user friendly.

### **3 Implementation of the CAP Reform by Member States**

#### *3.1 How should Member States compute decoupled aid?*

The CAP reform provides MS with two options for decoupling: a historic, individual scheme or a regional scheme. For both options, the basis for decoupled payments is the average of subsidy receipts for the 3-year period, 2000, 2001 and 2002, for crops, beef and sheep payments. However, the method of computation depends on the scheme.

In the historic scheme, the area of the reference period determines the number of entitlements (SPE). The value of the single farm payment (SFP) is computed as the average of subsidy receipts divided by the number of SPE. The hectares taken into account for the reference period refer to cereals, oil crops, protein crops, linseed, rice, grain legumes, starch potatoes, dry fodder, seeds and animal forage land. For set aside land, entitlements are computed on the average area.

The other option for decoupling is the regional scheme. In this case, the value of the entitlement is the same per hectare, computed as an average of each region. The MS having chosen this option have adopted a hybrid model for a transition period to mitigate revenue reductions for farmers. The hybrid models are either static or dynamic, and in both cases they combine SFP payments with a pure regionalisation model. The static models do not modify the given combination over time whereas the dynamic ones evolve towards a pure regionalisation model.

#### *3.2. Total or partial decoupling, options for partial re-coupling*

For crops, the intervention price remains unchanged. Apart from full decoupling, the options are to either retain up to 25% of the arable crop payments in the coupled form (apart from set aside payment) (the choice of France and Spain), or retain up to 40% of the durum wheat payment in coupled form.

Full decoupling of beef production is one of a number of options that are available at the Member State level. The other two options are to: either retain up to 100% of the suckler cow premium, 100% of the slaughter premium for calves and 40% of the slaughter premium for non calves (the choice of Belgium, Spain, France, Netherlands, Austria and Portugal), or retain up to 75% of the special beef premium and 100% of the slaughter premium (the choice of Denmark and Sweden)..

For sheep, apart from full decoupling, the option available is to continue up to 50% of the ewe premium (the choice of Denmark, Spain and France).

Introduced by the Agenda 2000 CAP reform, the new dairy payment can be part of the single farm payment.

**Table7 Member States decoupling choices**

Decoupling scheme		Full decoupling	Partial decoupling*
Historic		Ireland, Scotland, Wales	Austria, Belgium, France, Greece, Italy, Netherlands, Portugal, Spain
Hybrid	Static	Luxembourg	Denmark, Northern Ireland
	Dynamic	Germany, England	Finland

(\*) Not taken into account: cotton, hops, tobacco.

### 3.3. Technical implementation in AROPAj and expected results

Mathematical programming models make it possible to compute SFP and SPE as well as compare farmers' gross margins before and after the reform.

The computation of individual or regional decoupled payments in the AROPAj model is based on the results obtained using the Agenda 2000 policy as input. In the model, the single year of simulation is representative of the three year reference period. The prior AROPAj supports have been broken down according to different items related to possible decoupling combinations:

1. basic support for cereals, oilseeds and proteins;
2. specific support for durum wheat and specific support for proteins;
3. set-aside support;
4. extensification support related to livestock;
5. support for milk;
6. support for ovine, goats, and generally for "small" herds;
7. support for suckler cows;
8. support for male bovine; and,
9. other supports, possibly excluded from decoupling (taxes, sugar regime, etc.).

The decoupling reform as modelled with AROPAj is subject to the structure of the model, based on FADN regions and farm groups. Thus, it is possible to compute single farm payment for each farm group, or unique regional entitlement.

**Table 8** Synthetic economic results on national average farming systems

Member States	Farm number ('000)	Gross Margin/farm (k€)	FEOGA / farm (k€)	FEOGA / ha (k€/ha)
belg	36,5	27,4	13,1	0,353
dani	48,2	39,2	17,0	0,348
deut	255,5	79,5	19,4	0,337
ella	273,4	8,5	3,0	0,578
espa	302,1	23,6	9,0	0,230
fran	320,2	55,1	22,9	0,319
gbre	123,5	80,2	26,5	0,288
irla	128,7	19,5	9,1	0,291
ital	596,6	17,3	4,8	0,347
luxe	1,5	52,4	14,5	0,213
nede	65,4	59,8	14,0	0,489
osto	79,3	21,7	7,7	0,325
port	208,8	7,6	2,7	0,248
suom	49,3	29,4	8,0	0,225
sver	38,0	56,7	17,2	0,203
<b>EU</b>	<b>2527,0</b>	<b>33,2</b>	<b>10,9</b>	<b>0,309</b>

Some supports from the Agenda 2000 policy are currently not in the model, mainly owing to the general lack of data. For example, the FADN does not supply information about product destination, and it does not distinguish between seed crops and consumption crops. Consequently, neither does the model. Nevertheless, the total European budget devoted to agricultural policy is well represented.

The regionalisation option can be implemented without any difficulty in the AROPAj model in the cases where the regions in that option correspond to FADN regions upon which the AROPAj model is based (that is the case for Germany). Otherwise, some hypotheses are necessary about which part of a FADN region a farm-group belongs to (that is the case for England).

Two runs of the model are necessary to take into account decoupling. The first one makes possible to compute decoupled payments. The second one makes possible to measure the effects of the CAP reform on productions and revenues. Whereas the re-coupled payments had an influence on farmers' decisions in the model, the introduction of the computed decoupled payments does not modify the options chosen by farmers within the model.

The results shown in Table 8 are based on the "V1\_2001" version of AROPAj using the FADN-1997 data. The CAP reference is Agenda 2000, and parameters varied according to the simulations (mainly concerning livestock adjustment when its maximum variation did not exceed +/- 15%). The table contrasts the average gross margins per farm and average subsidies per farm and per hectare for 15 MS of the EU. These numbers, showing the situation before the Luxemburg reform, serve as a benchmark for the analysis in section 4.

#### 4 Preliminary results

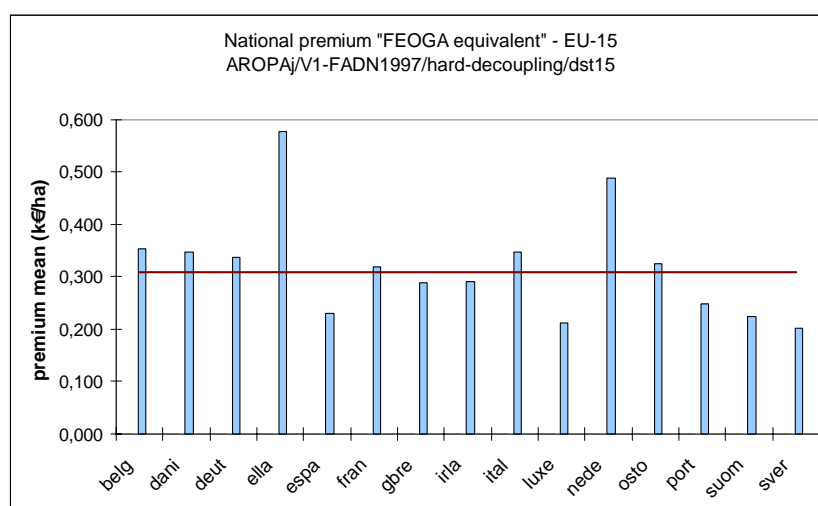
The results shown below are in accordance with a seminal work carried out by Jayet and Labonne realised in 2003, before the Luxembourg agreement, and published in 2005. This

work as well as the analysis given here are based on a complete de-coupling (also called “hard-decoupling”) so that all the land owned by the producer is eligible for the single payment (uniform payment per hectare), any which could be the use of land. Note that quota regimes (sugar, milk) have remained unchanged.

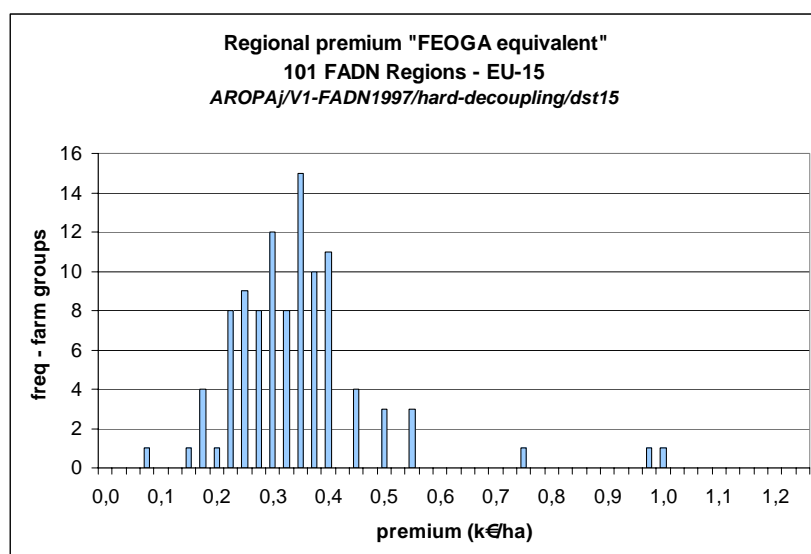
After some changes in parameters, some types of results expected from this kind of modelling are given. These results focus on the single payments computed at different scales and on the shadow costs of the land. These shadow costs are the dual values related to the land endowment constraints in the farm-group models, theoretically comparable to the yearly rental values. the V1 version of AROPAj has been the preliminary one used.

The results reflect the assumption of an unchanged agricultural budget. First, the average premium computed at the EU scale would be around 300€/ha, with a large variance at the Member States level, Regions, and farm groups (see histograms on figures 1, 2, and 3). Obviously, the base of the spectrum increases when the geographical unit decreases. At any given scale the differences are significant.

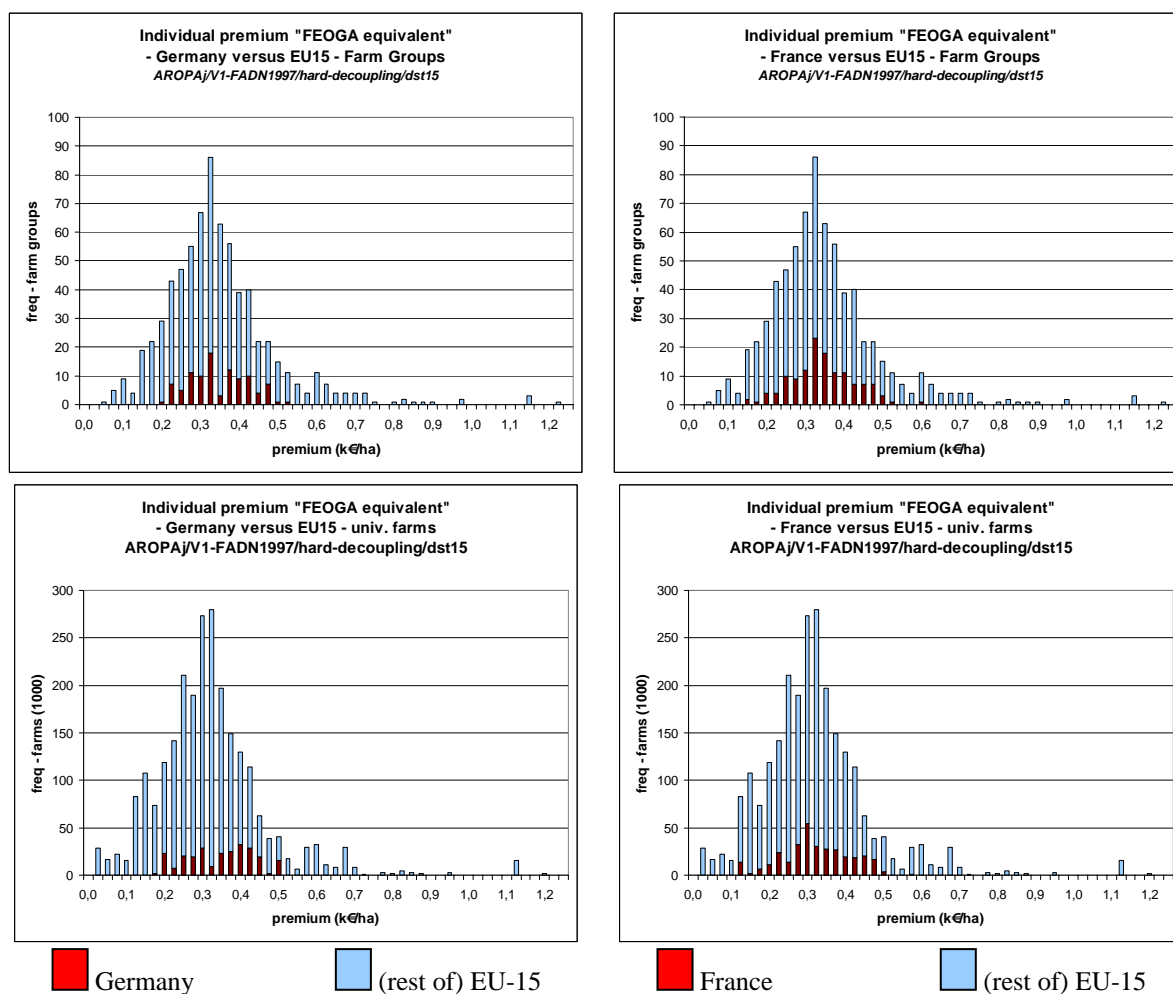
**Figure 1** National premiums under the unchanged FEOGA expenditure



**Figure 2** Regional premiums under the unchanged FEOGA expenditure



**Figure 3** Farm-group premiums per ha when the regional support is unchanged : comparisons for Germany and France, with or without FADN weights



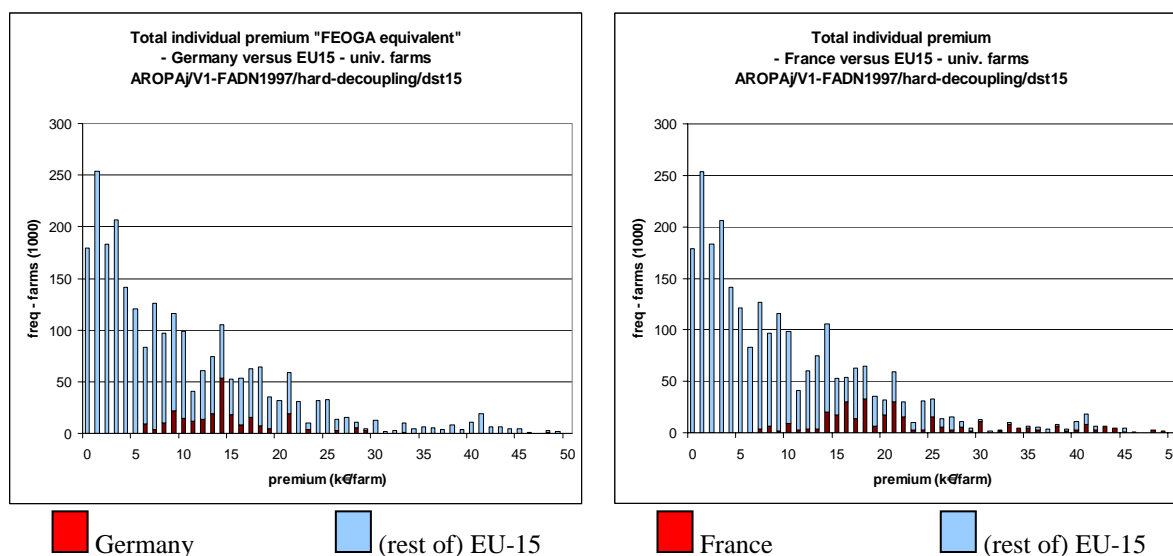
In addition, some figures show the change in land use, according to large groups of land activities (see table 9). A further analysis will be needed to indicate how substantial the

change could be at different scales and for different places. This will be carried out within the framework of the GENEDEC programme. The other key-point easily observed below is the differentiated distribution of premiums, comparing France and Germany, which is more apparent on the histograms based on FADN weights related to farm-groups (figure 3). The variance of premiums per hectare is larger for German farmers than for French ones. This would be quite the reverse if we analysed the distribution of premiums per farm.

**Table 9** Change in acreage between Agenda 2000 and “de-coupling”

acreage	Agenda 2000	hard-decoupling	variation (kha)	variation (%)
cereals ("straw")	36661,9	34987,4	-1674,5	-4,6
rice	214,2	214,9	0,7	0,3
oilseeds & proteins	6461,8	6794,9	333,1	5,2
sugarbeets	2067,7	2363,5	295,8	14,3
subsidized set-aside	5173,0	0,0	-5173,0	-100,0
potatoes	2873,3	2870,6	-2,7	-0,1
fallow	830,6	6072,7	5216,9	628,1
forage	8890,3	6911,8	-1953,3	-22,0
meadows	26241,9	29198,8	2956,9	11,3
<b>TOTAL Agr. Area</b>	<b>89414,5</b>	<b>89414,5</b>	<b>0,0</b>	<b>0,0</b>

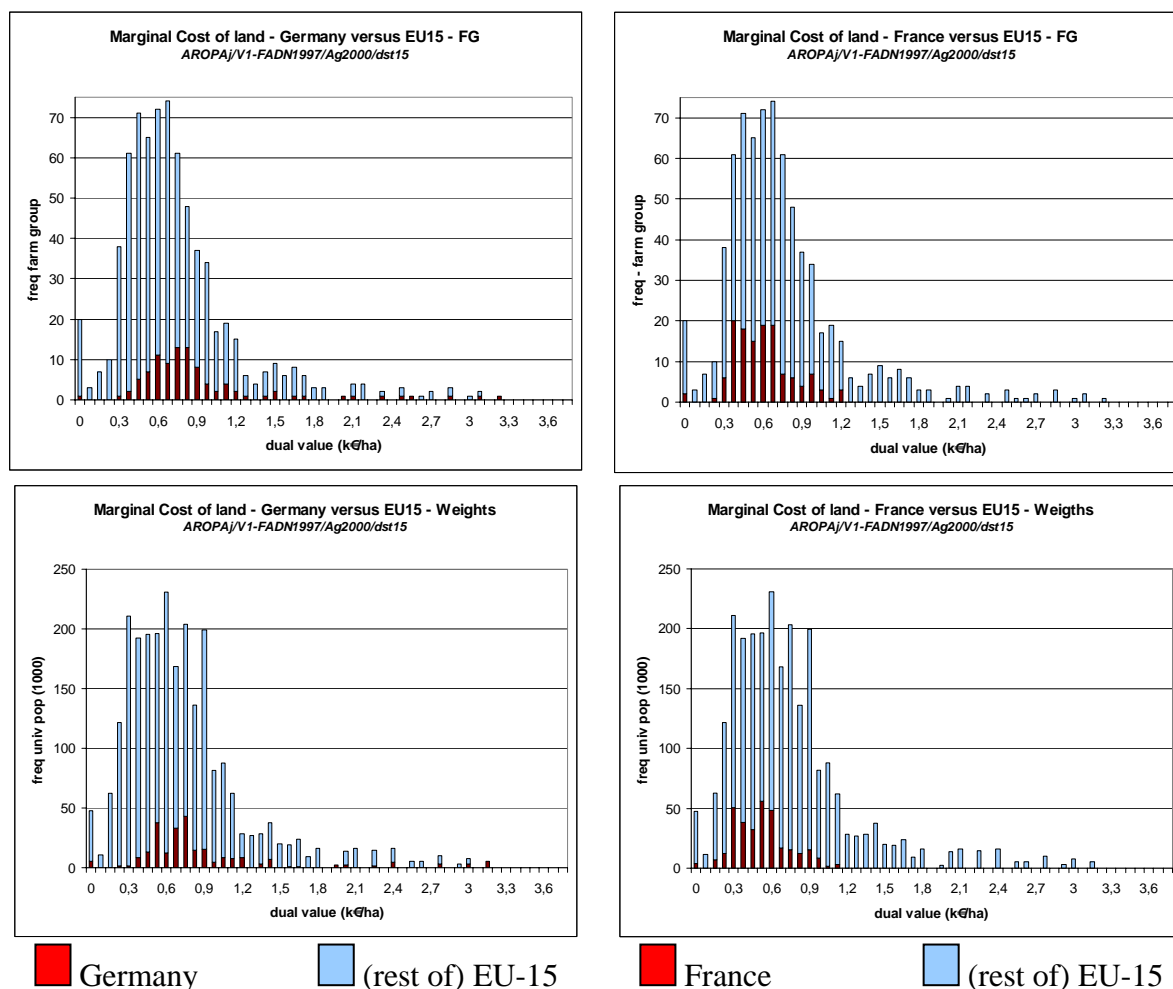
**Figure 4.** Farm-group premiums per farm when the regional support is unchanged: comparisons for Germany and France, with FADN weights



The shadow costs of land shown below give the economic value of the land taking into account direct support (by the construction of the model). The distribution of values for farm-groups (and farms through the FADN weights) is shown in the histograms (figures 5 and 6).

The mean of the marginal values of the land is greater for German farmers than for French farmers, and the variance is greater for France than for Germany. These results were obtained by using the V1 (figure 5) and V2 (figure 6) versions of AROPAj. Even if the V2 version has not been finalised (36 farm-groups should be re-calibrated), the results appear to be quite robust.

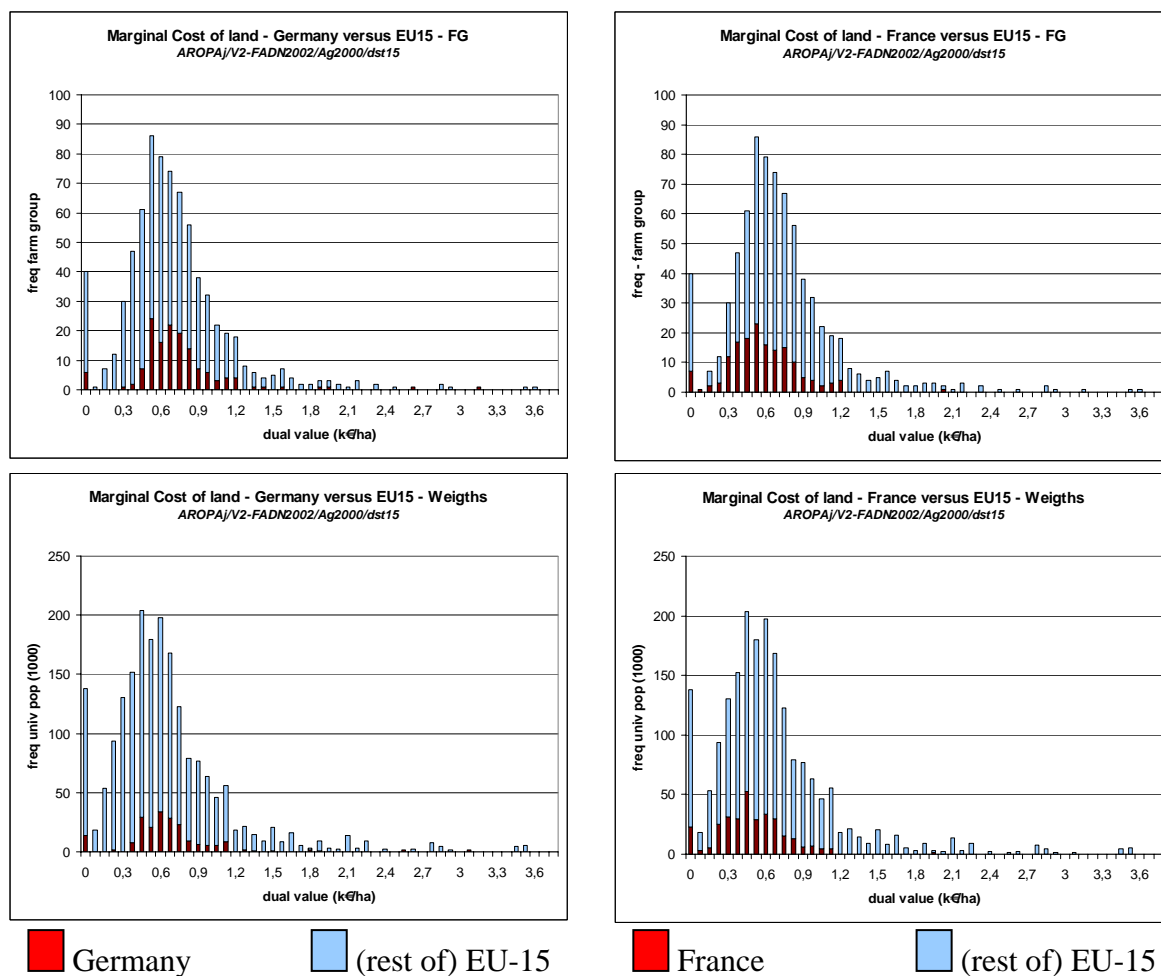
**Figure 5** Shadow costs of land – Agenda 2000: comparisons for Germany and France, with or without FADN weights V1 Version



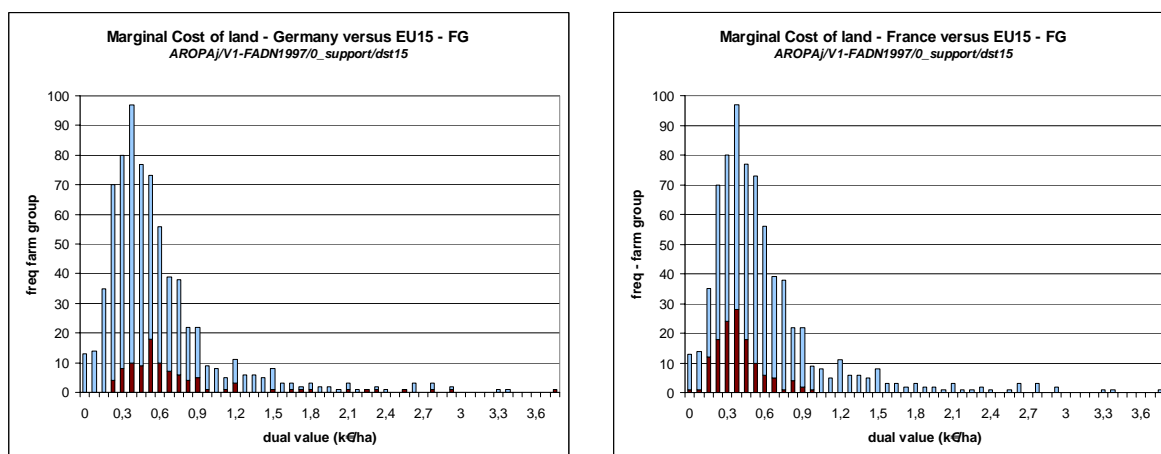
Finally, we turned our attention to shadow costs of the land under the de-coupling scenario. The V1 version of AROPAj has been used. In order to estimate the marginal cost independently of the support, the impacts of de-coupling have been simulated in the case when the single payment is suppressed (equal to 0). When the SPF is related to the land, the shadow cost depends additively on the SPF.

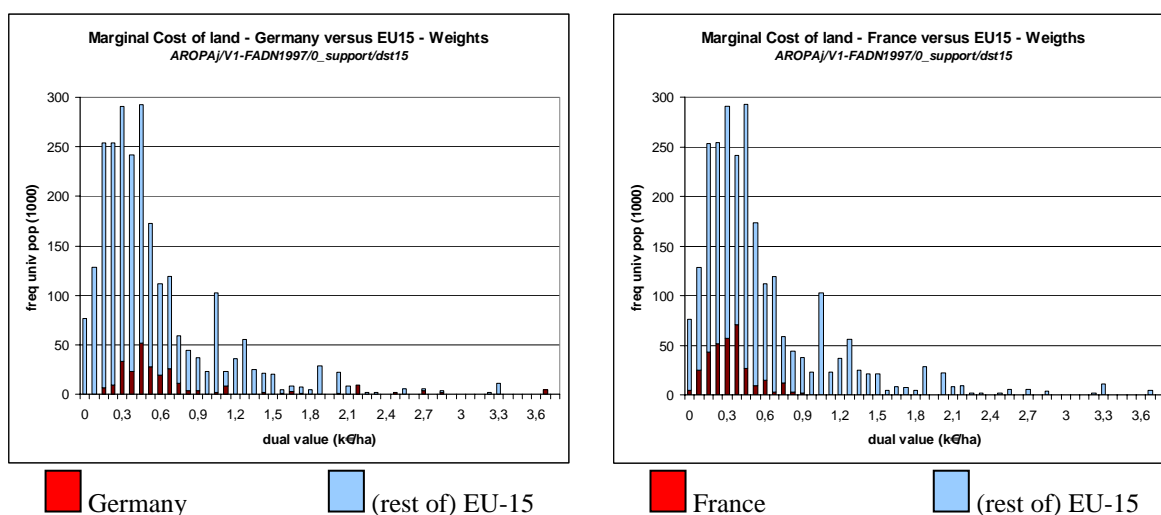
A significant change in the distribution is evident, with a clear concentration of the shadow costs of the land, and, more importantly, a shift toward lower values. One clear outcome is that the change in the CAP would imply a significant change in the land market (rent or purchase).

**Figure 6** Shadow costs of land – Agenda 2000: comparisons for Germany and France, with or without FADN weights V2 Version



**Figure 7** Shadow costs of land – No support (SPS equal to 0): comparisons for Germany and France, with or without FADN weights V1 Version





## 5. Extensions and improvements

### 5.1 Inclusion of New Member States

In 2004, farmers in New Member States (NMS) were entitled to a payment of 25% of the UE-15 rate, rising to 100% in 2013 of the then applicable rate. The NMS had the choice of applying the EU's scheme for agricultural support from the date of accession or opting for a simplified area payment scheme (SAPS). Most of NMS opted for the simplified scheme. The simplified area payment scheme lasts for 3 years (extendable to 5), after which the regionalised SPS will apply. The SAPS is a simplified scheme, motivated by the concern that the NMS would have neither the necessary data nor administrative capacity to implement the old scheme when first entering the EU.

The basic idea of the insertion of the NMS in the decoupling scheme is that the NMS's entitlement (based on the base areas, reference yields, quotas, etc., written into the Accession treaty) would be paid at a uniform rate per hectare of agricultural land.

The extension of AROPAj to NMS will be straightforward; once there will be available FADN data for NMS and hopefully in the same format as for the EU-15. These data will be downloaded in the model and all processing steps will be applied. For other extensions (like coupling AROPAj with a crop model in order to compute the optimal yields and fertilizer input) developed around the economic model, it could be more difficult to directly apply the process previously developed for the EU-15. Nevertheless, these difficulties should be attenuated with extended data bases devoted to physical indicators, and a lot of data does pre-exist (on soil, climate, and phenology).

### 5.2 Measuring environmental impacts

Some environmental impacts will be easily analysed deploying the "response functions" which models the relationship between the yield the N-input, for each crop and each farm group. This approach is now being tested for three FADN regions in France (see Bamière *et al.*, 2005 for a preliminary presentation).

A new module dedicated to nitrogen balance, taking into account nitrogen inputs from purchased industrial fertilisers and manure is now related to yield functions provided by

coupling with a crop model. We intend to develop and incorporate response functions for other pollutants. That requires a larger multi-disciplinary approach which is being backed by GENEDEC and other research programmes. Let us note that GENEDEC will focus on indicators related to nitrogen and atmospheric pollutants (N<sub>2</sub>O, NH<sub>3</sub>).

Our ambition is to make available results with up and down scaling in order to provide policy makers with information that is at ones related to land or related to farm-group at different scales. INSEA also a FP6 project will produce the first study of this kind, following results provided by national research on the environment and mainly devoted to the estimation of marginal cost of greenhouse gas abatement (De Cara *et al.*, 2005).

## Note

Paper prepared for the Workshop “*Implementing the CAP reform in the new Member States: impact on the sustainability of Farming Systems*” jointly organised by the Directorates-General Agriculture, Research and Technological Development and Joint Research Centre/Institute for Prospective Technological Studies, Seville, 6-7 October 2005.

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# Key issues related to the application of cross-compliance in old and new Member States

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## Abstract

*Cross-compliance has increasingly been used to integrate environmental considerations into the CAP. From 2005 it became compulsory for all Member States to ensure that recipients of direct payments adhered to Statutory Management Requirements (SMRs, stemming from 19 EU regulations and directives) and kept their whole agricultural holding in 'Good Agricultural and Environmental Condition' (GAEC) to be defined by Member States (or regional authorities). The potential for cross-compliance to enhance implementation of EU environmental legislation and reach a large area of farmland seems good, although there are some questions remaining over whether it will reach the agricultural land at most risk of environmental damage or with highest nature value. In addition farmers could react in several ways to exempt themselves or some area of their holding from cross-compliance conditions. Member States (or regional authorities) have taken a variety of approaches to setting cross-compliance standards, some of which seem minimal and vague. There is scope for the SMRs and GAEC to cover more environmental issues. Better guidance at EU level and increased communication could enhance implementation of cross-compliance. Self-audits and co-operation with private assurance schemes should be explored to save duplication of administrative efforts.*

## 1 CROSS-COMPLIANCE CONCERTED ACTION

The project 'EU Cross-compliance' was funded by the European Commission's RTD programme, 'Quality of Life and Management of Living Resources' for the period 2003-2005. Total project funds amounted to €450k. The project included a series of six pan-European stakeholder meetings, national reports on Good Farming Practice from most Member States and publication of four issues of a newsletter. All outputs can be found on the internet at <http://www.ieep.org.uk/projectMiniSites/crosscompliance/index.php>

The project was co-ordinated by the Institute for European Environmental Policy (IEEP), in co-operation with the German Federal Agricultural Research Centre (FAL), Dutch Centre for Agriculture and Environment (CLM), Spanish Universidad Politecnica de Madrid (UPM), Czech Institute for Structural Policy (IREAS) and Danish Royal Veterinary and Agricultural University (KVL) with input from the Agricultural University of Athens (AUA), Lithuanian Institute of Agrarian Economics (LIAE) and Italian Istituto Nazionale di Economia Agraria (INEA).

## 2 POLICY BACKGROUND

With pressure to integrate environmental concerns into agriculture, 'cross-compliance' is a policy tool being increasingly used to improve the environmental impacts of farm management. Cross-compliance in the context of the Common Agricultural Policy (CAP) sets environmental and other standards (registration and identification of animals, animal welfare and animal, human and plant health) that farmers must adhere to in order to receive subsidies. A discussion about the relevance

of cross-compliance to European agricultural policy emerged during the 1990s, along with a growing commitment within the European Commission (EC) to integrate environmental considerations into agricultural policy.

The introduction of 'direct payments' for some Common Market Regimes (CMOs) was a major element of the 1992 'MacSharry' reforms of the CAP. This prompted a debate on the wider purpose of agricultural support policies and the importance of farmers meeting their environmental, farm animal welfare and other responsibilities. The MacSharry reforms introduced modest environmental cross-compliance on certain elements of the CAP, such as the management of compulsory set-aside in arable cropping. Member States also had the option to attach environmental conditions to CMOs (beef and suckler cow premia from 1993 and sheep and goat premia from 1994).

The 'Agenda 2000' reform of the CAP established the concept of Pillar One ('direct payments') and Pillar Two ('rural development payments') and introduced further options for the application of cross-compliance. All direct payments could be subject to cross-compliance under Article 3 of the Common Rules Regulation (1259/1999). Member States tended to focus voluntary cross-compliance on relatively specific farm management activities. In the Netherlands, for example, cross-compliance applied only to pesticide use in starch potato crops and maize. In France, farmers claiming premia for irrigated maize were obliged to obtain appropriate permits in relation to water abstraction. In Denmark an explicit link was made between eligibility for certain direct payments and compliance with a pollution control measure requiring appropriate field management along the banks of streams and rivers (Petersen and Shaw 2000). There are, however, examples of countries that included a wider range of environmental conditions, such as Greece.

Since 2000 'usual good farming practice' (GFP) under the Second Pillar of the CAP has been compulsory on the whole farm for recipients of agri-environment and Less Favoured Area payments. All Member States have been obliged to define GFP and specify verifiable standards in their Rural Development Plans. In 2001 the Small Farmers' Scheme (Regulation 1244/2001) introduced the concept of 'Good Agricultural Condition' (GAC), and required farmers receiving decoupled payments under this scheme to keep their entire holding in GAC, to be defined at Member State level.

The twelve pre-accession Member States had to define GFP in their rural development plans for 2000-2006 for funding under the Special Accession Programme for Agriculture and Rural Development ('SAPARD', Regulation 1268/1999). The ten Member States that joined the EU in 2004 have to ensure land receiving First Pillar payments through the Single Area Payment Scheme (Regulation 583/2004) is 'maintained in good agricultural condition compatible with the protection of the environment' (Accession Treaty, 23.9.2003, Article 47).

The 2003 Mid Term Review (MTR) of the CAP made cross-compliance a compulsory measure, applying to all direct payments (via the 'Single Farm Payment') from 2005. Member States must now set farming standards in relation to 19 European Union (EU) regulations and directives (Statutory Management Requirements or SMRs), define Good Agricultural and Environmental Conditions (GAECs) and ensure

compliance with those standards and conditions, as defined by the Member States, on farms receiving CAP subsidies. Conservation of permanent pasture and provision of a farm advisory service must also be carried out by Member States.

**Table 1** Statutory Management Conditions in Annex III of Regulation 1782/2003

<b>A. Applicable from 1.1.2005</b>		
<i>Environment</i>		
1.	Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds (OJ L 103, 25.4.1979, p. 1)	Articles 3, 4(1), (2), (4), 5, 7 and 8
2.	Council Directive 80/68/EEC of 17 December 1979 on the protection of groundwater against pollution caused by certain dangerous substances (OJ L 20, 26.1.1980, p. 43)	Articles 4 and 5
3.	Council Directive 86/278/EEC of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture (OJ L 181, 4.7.1986, p. 6)	Article 3
4.	Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (OJ L 375, 31.12.1991, p. 1)	Articles 4 and 5
5.	Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna (OJ L 206, 22.7.1992, p. 7)	Articles 6, 13, 15, and 22(b)
<i>Public and animal health</i>		
<i>Identification and registration of animals</i>		
6.	Council Directive 92/102/EEC of 27 November 1992 on identification and registration of animals (OJ L 355, 5.12.1992, p. 32)	Articles 3, 4 and 5
7.	Commission Regulation (EC) No 2629/97 of 29 December 1997 laying down detailed rules for the implementation of Council Regulation (EC) No 820/97 as regards eartags, holding registers and passports in the framework of the system for the identification and registration of bovine animals (OJ L 354, 30.12.1997, p. 19)	Articles 6 and 8
8.	Regulation (EC) No 1760/2000 of the European Parliament and of the Council of 17 July 2000 establishing a system for the identification and registration of bovine animals and regarding the labelling of beef and beef products and repealing Council Regulation (EC) No 820/97 (OJ L 204, 11.8.2000, p. 1)	Articles 4 and 7

**Table 2** Good Agricultural and Environmental Conditions in Annex IV of Regulation 1278/2003

Issue	Standards
<i>Soil erosion:</i> Protect soil through appropriate measures	<ul style="list-style-type: none"> <li>— Minimum soil cover</li> <li>— Minimum land management reflecting site-specific conditions</li> <li>— Retain terraces</li> </ul>
<i>Soil organic matter:</i> Maintain soil organic matter levels through appropriate practices	<ul style="list-style-type: none"> <li>— Standards for crop rotations where applicable</li> <li>— Arable stubble management</li> </ul>
<i>Soil structure:</i> Maintain soil structure through appropriate measures	<ul style="list-style-type: none"> <li>— Appropriate machinery use</li> </ul>
<i>Minimum level of maintenance:</i> Ensure a minimum level of maintenance and avoid the deterioration of habitats	<ul style="list-style-type: none"> <li>— Minimum livestock stocking rates or/and appropriate regimes</li> <li>— Protection of permanent pasture</li> <li>— Retention of landscape features</li> <li>— Avoiding the encroachment of</li> </ul>

### 3 POLICY RELEVANCE

Cross-compliance within the Mid Term Review of the CAP has contributed to justification for de-coupling of the First Pillar. It is unlikely that it would ever be acceptable again for land managers to receive direct payments without conditions being attached. The future for some sort of cross-compliance remains fairly secure as long as direct payments continue, although the details are open for debate, and the importance of direct payments may be reduced in future. The new legitimacy for direct payments through cross-compliance might, at least in the nearer future, hamper the reallocation of funds in favour of more targeted rural development measures, i.e. the transfer of funds from the First to Second Pillar, so called modulation. That said, the scope for increasing Second Pillar funds might also be limited in the current budgetary climate, so cross-compliance on direct payments may become an important mechanism for delivering environmental benefits in agriculture.

In New Member States the policy is particularly relevant since it applies to a large proportion of farmland (all land registered and receiving SAPS). The potential effect of GAEC on farmland is major, especially during the transition period. In addition GAEC provides a valuable opportunity to combat land abandonment.

### 4 IMPLEMENTATION IN NEW MEMBER STATES

New Member States have taken varied approaches to defining GAECs for SAPS recipients. The table below shows a summary of coverage of issues.

**Table 3** GAEC of New Member States (after Camrova *et al.* 2004)

Country	Category	Standards
Czech Republic	<i>Soil erosion</i>	<ul style="list-style-type: none"> <li>• The protection of landscape features helping to avoid soil erosion by wind and water (hedgerows, terraces, valley lines, wind-break stripes and contour field paths with drains).</li> </ul>
Estonia	<i>Minimum level of maintenance</i>	<ul style="list-style-type: none"> <li>• Farmer has to grow crop, which has to be established by 15 June or keep the land under black fallow.</li> <li>• Grassland has to be mown once and the hay has to be collected or the land has to be grazed before 31 July.</li> <li>• Land which has been abandoned should also be sown by 15 June or kept under black fallow or mechanical weed treatment should be done.</li> </ul>
Hungary	<i>Soil erosion</i>	<ul style="list-style-type: none"> <li>• Ensure a minimum soil cover before spring sown crops in areas exposed to erosion.</li> <li>• Contour tillage in areas susceptible to erosion.</li> <li>• Preservation of terraces.</li> <li>• Growing row crops on plots where the angle of slope is higher than 12% is prohibited.</li> <li>• Preserving uncultivated green spaces (plot edges, hedges, etc.) that act as natural soil protection features.</li> </ul>
	<i>Soil organic matter</i>	<ul style="list-style-type: none"> <li>• Using crop rotation with regard to the agro-ecological features of the region.</li> <li>• Using stubble ploughing and stubble management after harvest.</li> <li>• Stubble burning is prohibited, except on order of the plant health authority.</li> </ul>
	<i>Soil structure</i>	<ul style="list-style-type: none"> <li>• Using appropriate machinery and practices according to the cultivation category of the land.</li> <li>• Using periodical deep tillage.</li> </ul>
	<i>Minimum level of maintenance</i>	<ul style="list-style-type: none"> <li>• Keeping arable lands tilled, ensuring weed free status of the plot.</li> <li>• The appearance and spread of undesired herbs and ligneous plants in agricultural areas must be prevented.</li> <li>• Utilisation of grassland types accordingly with mowing or grazing, and at least one clearing mowing must be carried out every year.</li> </ul>
	<i>Biodiversity</i>	<ul style="list-style-type: none"> <li>• Preserving the natural landscape elements.</li> <li>• Preservation of the natural grasslands must be ensured.</li> <li>• Grazing must be adapted to the natural production capacity of the grassland.</li> </ul>
Latvia	<i>Soil organic matter</i>	<ul style="list-style-type: none"> <li>• Plants or plant and stubble remains are worked into soil with the purpose of fertility maintenance of the land.</li> </ul>
	<i>Minimum level of maintenance</i>	<ul style="list-style-type: none"> <li>• Agricultural land is cultivated and crops are grown in accordance with agricultural practices, and agricultural land is free from invasive plant species (<i>Heracleum sosnowsky</i>) and bushes.</li> <li>• Land amelioration systems being in charge of the farmer are properly maintained, ensuring regulation of the soil moisture regime.</li> <li>• Grasslands and meadows are used for grazing of animals or feed production – grazing lands and meadows are grazed or meadows are mowed for the first time no later than 1 August and grass is gathered without delay.</li> </ul>

Lithuania	<i>Minimum level of maintenance</i>	<ul style="list-style-type: none"> <li>• Arable land shall be planted with agricultural plants or be left as green or black fallow. Black fallow shall be cultivated periodically in order to free it from weeds and to improve the quality of the soil.</li> <li>• Meadows and pastures as well as perennial grasslands and pastures shall be maintained in good condition, used for grazing animals or/and the hay shall be harvested at least once a year (before 1<sup>st</sup> August).</li> <li>• Hay or green mass shall be cut and removed from the field before 1 August. Hay, straw and remnant plants may be mowed at the edge of the field.</li> <li>• Arable land, meadows, pastures as well as perennial grasslands and pastures shall be free from trees and bushes, except in the case of the area of detached trees and bushes or a group of trees and bushes which is excluded from the eligible area.</li> <li>• Agricultural land shall be free from remnant herbs (hard herb plants - wormwood, thistle and others). The presence of detached weed or herb clusters in the field shall not be considered as non -compliance.</li> </ul>
	<i>Soil organic matter</i>	<ul style="list-style-type: none"> <li>• It is forbidden to burn hay or straw in the field.</li> </ul>
Poland	<i>Minimum level of maintenance</i>	<ul style="list-style-type: none"> <li>• Crop cultivation or fallow - for arable land.</li> <li>• Grass mowing once a year in vegetation period - for grasslands.</li> <li>• Grazing in grass vegetation period - for pastures.</li> <li>• Agricultural land should not be covered by trees and shrubs except: trees and shrubs protected under the Nature Protection Law, those which are important for water and soil protection, trees and shrubs which do not influence agricultural production on this land.</li> </ul>
	<i>Soil erosion</i>	<ul style="list-style-type: none"> <li>• Agricultural land on slopes with 20° slant - farmer should retain terraces.</li> <li>• Agricultural land on slopes with 20° slant - farmer should retain soil cover or mulching.</li> <li>• In agricultural land on slopes with 20° slant crop cultivation with the ridge along the slope is forbidden.</li> <li>• In agricultural land on slopes with 20° slant, keeping land under black fallow is forbidden.</li> </ul>
	<i>Soil organic matter</i>	<ul style="list-style-type: none"> <li>• Arable land should not be kept as fallow land longer than 5 years (meadows and pastures can be cultivated in rotation).</li> <li>• It is forbidden to burn meadows, pastures and stubble.</li> </ul>
Slovakia	<i>Soil erosion</i>	<ul style="list-style-type: none"> <li>• Save the soil by suitable measures to stop the physical soil degradation by wind and water erosion.</li> <li>• Secure basic care of agricultural land by destroying weeds and preventing invasion of trees and other shrubs on the agricultural parcel</li> </ul> <p><i>Control of standards</i></p> <ul style="list-style-type: none"> <li>- planting a special agricultural and protective green - visual control (photos)</li> <li>- relief contour line agri-technology – visual control (photos)</li> <li>- crop rotation with protective effect – control of crop/parcel book documentation</li> <li>- mulch crop combined with non-ploughing technology - visual control (photos)</li> </ul> <p>non-ploughing technology - visual control (photos)</p>

	<i>Soil organic matter</i>	<ul style="list-style-type: none"> <li>• Realise good after-harvest stubble treatment, to stop spreading of diseases, weed and pests.</li> <li>• Use the agricultural land by suitable way, without endangering ecological stability of the land.</li> </ul> <p><i>Control of standards</i></p> <ul style="list-style-type: none"> <li>- has at least 10% perennial forage crops - control of crop/parcel documentation, e.g. Land Parcels Identification System (LPIS), parcel – book</li> </ul> <p>not to crop in monoculture on the same parcel more than 3 years– potato, sunflower and sugar beet - control of crop/parcel documentation ,e.g. LPIS, parcel – book</p>
	<i>Soil structure</i>	<ul style="list-style-type: none"> <li>• Keep the soil structure in good condition by using a suitable farming method</li> </ul>
	<i>Minimum level of maintenance</i>	<ul style="list-style-type: none"> <li>• To conserve the landscape, when possible.</li> <li>• To conserve meadows and pastures by cutting and grazing. Cutting must be done at least once a year. Pastures which can be entered by machines must have under-grazed parts cut at least once a year.</li> </ul> <p><i>Control of standards</i></p> <ul style="list-style-type: none"> <li>- visual controls</li> </ul>
Slovenia		Considering that Slovenia has implemented standard system of direct payment it has no GAEC standard yet.

## **5 ISSUES IN NEW MEMBER STATES**

### *Scrub and tree growth/abandonment*

Conflicts are apparent between the benefits of spontaneous landscape restoration or maintenance of some landscape features such as scrub and solitary trees and the need to prevent abandonment of farmland. In CEECs some intensively maintained countryside (fields, meadows) is partly covered by bushes and trees. Bushes and solitary trees can be very important for biodiversity and also play an important anti-erosion and microclimatic role. In some countries (e.g. the Czech Republic) standards (and therefore eligibility for subsidies) are formulated to prevent scrub growth. In the Czech Land Parcels Information System (LPIS), farmers have to exclude every single tree in order to define their eligible land. As a result some farmers have cut trees and bushes to simplify their paperwork. There is a clearly a need to establish a balance between keeping valuable trees and bushes and clearing abandoned land and a flexible approach is needed.

### *Good agricultural or environmental condition*

A Latvian standard demonstrates well the conflicts between good agricultural and environmental condition. Land drainage systems are to be properly maintained, ensuring regulation of the soil moisture regime. However, degradation of wetlands due to agricultural intensification is a serious recent problem influencing biodiversity and worsening water quality. Additionally, wetlands could be a rich source for fodder or energetic biomass. This standard illustrates the dilemma in CEECs over whether to promote good agricultural or environmental condition. The purpose of decoupling is not yet fully understood; agricultural production remains a priority rather than dealing with water quality, erosion, climatic change and biodiversity issues.

### *Mowing and biodiversity*

The timing and frequency of mowing and harvest is one of the most influential factors for grassland biodiversity. The regions most endangered by abandonment are often the most biodiversity rich. On the one hand, most herb-rich grasslands demand early mowing; on the other hand many insects and birds require late mowing. As a result, standards should take into account regional and biotope differences.

## **6 PROJECT CONCLUSIONS**

### *Enforcement of legislation*

Cross-compliance should contribute to further integration of environmental objectives into the CAP. To date, insufficient application of EU environmental legislation has been a problem in many areas of the EU (particularly for the Nitrates Directive, see EC 2005). Cross-compliance is expected to strengthen the application and enforcement of environmental standards in agriculture, as poor enforcement can lead to potentially significant penalties for Member States (disallowance of CAP funds) and farmers (withdrawal of direct payments plus a risk of extra penalties stemming from national legislation).

However, the incentives to comply with cross-compliance standards will be highest for farmers that receive the most direct payments, yet these are unevenly distributed between farms and may decrease in importance in the long run. The farms that receive

the least direct payments may also be those with higher nature value (due to being in extensive, less productive areas). In addition, farms not receiving direct payments will not be subject to cross-compliance, although they will still have to comply with EU and national legislation since this is the legal baseline and applies to all farmers, not just those receiving direct payments. This means that important sectors (such as vegetables, vines and fruit, and to some extent poultry and pig farming) that can be associated with severe environmental impacts could be exempt from cross-compliance standards.

Some farmers that are eligible for direct payments may also decide that the costs of cross-compliance are too high and will choose to forgo their direct payments in order to be freed from their obligation to meet cross-compliance standards. Even if farmers opt out they are obliged to abide by national and EU environmental legislation. However it is uncertain whether farmers that opt-out of direct payments will receive less compliance checking. In most Member States the compliance checking authority would deny that this could occur, but in practice with the risk of disallowance of Pillar One funds from the European Commission the Member State may choose to focus compliance checks on recipients of direct payments.

Opting out at farm level is presently not a realistic option for most farms, but could become more attractive if direct payments decrease in future. In the next few years other forms of opting out will become more crucial, such as the legal separation of parts of the holding. For instance a farm could be legally split so that areas without direct payment rights (such as pig or poultry production) would not be subject to cross-compliance (which should apply to a whole farm, whether all of it is eligible for direct payments or not) and single plots with additional, statutory requirements (such as uncultivated, marginal land with a high management cost or Natura 2000 sites) might be separated from the main area and abandoned.

#### *Environmental outcomes*

Only a few concrete farm level SMRs have been legally defined at farm level by the European Commission. GAEC according to Annex IV leaves considerable scope for variation in national definitions, especially regarding soil protection and management requirements for uncultivated land. Considerable subsidiarity is available to Member States with definition of cross-compliance standards. Many Member States appear to have been tempted to define very light standards for cross-compliance to minimise administrative costs and disallowance risks (Swales & Farmer 2004). In Finland, for instance, rules intended to conserve permanent pasture (mowing, grazing or otherwise clearing vegetation is required) appear modest and vague and could lead to mixed environmental outcomes depending on which method the farmer adopts, how frequently it is undertaken and at what time of year. More guidance on these issues could secure improved environmental benefits. As a counter measure to the minimal approach that many Member States seem to have taken a higher baseline could be introduced at EU level. However, if cross-compliance is raised much above legal minima a position could be reached where the boundary between Pillar One and Pillar Two payments, such as agri-environment incentive schemes, became blurred. This could jeopardise agri-environment schemes that offer incentive payments to farmers for particular activities which are calculated according to the income foregone. If agri-environment schemes are trying to promote the same activities that are legally

required, or something only marginally more ambitious, the income foregone will be reduced and so will the incentive payments. The uptake of agri-environment schemes in these circumstances might therefore be restricted.

At present Annex IV covers selected environmental issues (such as soil) that are complementary to those covered in Annex III. There is, however, a strong case for water and irrigation issues to be incorporated, in line with the requirements of the Water Framework Directive. Pesticide use, air pollution and waste could also be incorporated (the latter is a particular issue in Central and Eastern European Countries). The proposed European Agriculture Fund for Rural Development (EAFRD, governing Pillar Two rural development payments) would require recipients of selected payments to apply cross-compliance as set out in Annexes III and IV. The EAFRD also states in Article 37 that: ‘farmers and other land managers undertaking agri-environment commitments shall respect minimum requirements for fertiliser and plant protection product use. Article 37 was included to ensure that some issues that were previously covered by standards in the previous Rural Development Regulation (‘Good Farming Practice’ or GFP in Regulation 1257/1999) would not be lost. Article 37 could also usefully apply to Pillar One payments.

#### *Administrative demands*

The potentially high administrative demands of effective implementation of cross-compliance could be a limiting factor. Member States are required to check five per cent of holdings for compliance with SMRs and GAECs using nationally or regionally defined indicators. However, Member States must walk a line between picking too few requirements or indicators (therefore failing to implement SMRs in an adequate way) and specifying too many (creating an administratively unworkable system). Member States must also choose whether to use ‘hard’ standards or ‘soft’ measures. Hard standards (i.e. documentation showing that pesticide spraying equipment has been serviced regularly) are easier to verify and unambiguous (either valid paperwork exists or it does not) and therefore unlikely to cause disputes and appeals but may fail to capture the real purpose of the SMR which is to deliver environmental benefits (well serviced pesticide sprayers need to be handled appropriately as well as serviced to minimise applications). In comparison ‘soft’ measures (such as timing of hedge-cutting or methods of mowing) are more related to environmental outcomes (such as protection for nesting birds or maintenance of feeding sites for over-wintering birds) and perhaps more useful but are much more difficult to verify on the ground without appropriate expertise, data and effort. For instance stocking density limits are useful for promoting sward mixtures that support high biodiversity, but stocking rates are difficult to determine when stock is not present and it would be very difficult for all control visits to occur at a time when stock was evenly spread throughout the grazing area.

#### *Competitiveness*

At present it seems that Member States vary considerably in their approach to selecting verifiable measures, which could lead to inconsistent implementation and an uneven playing field. Standards vary between countries and regions, affecting cross-border producer costs. There is also expected to be an affect on the competitiveness of EU products in the world market since cross-compliance conditions within the EU are relatively demanding compared to the rest of the world. Competitiveness of European agriculture and the impacts of cross-compliance is the subject of a new three-year

study funded by DG Research under the Sixth Framework Programme (see Ecologic 2005).

### *Cost efficiency*

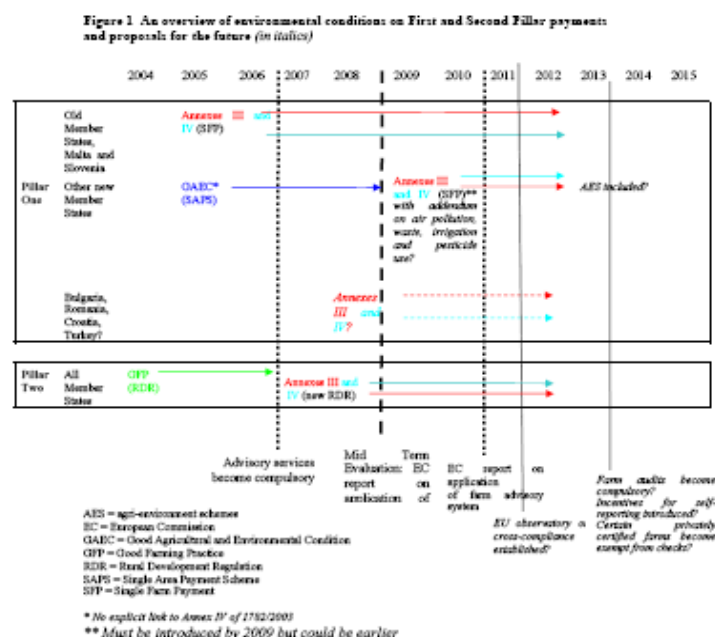
The big question is whether the administrative costs of cross-compliance are justified by the environmental outcomes. The administrative demands of cross-compliance (design of verifiable conditions, compliance checking, monitoring etc.) are likely to be significant. It has been estimated that in the UK the cost of developing information materials for farmers on cross-compliance is £50K-£70K (€71K to €100K) for each guidebook (cited in Varela-Ortega & Calatrava 2004). In relation to control costs, the time required for cross-compliance controls visits (which must be carried out on one per cent of recipients of the Single Farm Payment) is estimated to be 60-80 hours per farm in the Netherlands and 2-3 days per farm in Sweden (cited in Varela-Ortega and Calatrava 2004). Controls and penalties should be balanced with an approach aiming to create trust and co-operation amongst farmers to maximise compliance. Self-auditing by farmers could be explored as a method of reducing the number of farm visits and promoting trust and co-operation.

Co-operation with private assurance schemes could also be promoted in an effort to reduce administrative costs. Many private assurance schemes operate in the EU as independent certification organisations, setting their own production standards (in relation to the environment, animal welfare and other issues) and marketing their own label. Further public/private co-operation on standard setting, enforcement, advice, inspection and sanctions could contribute to increased efficiency and effectiveness in both the public and private sector through sharing experiences and lessons learned. Since many private assurance schemes involve the checking of standards similar to those in the SMRs there could also be an opportunity to share responsibility for some compliance checking, or farmers could be given an exemption from cross-compliance checking if certified by one of a selection of farm assurance schemes. There is a question, however, over whether private initiatives should act as the 'police' for standards in agriculture. Private assurance schemes often get most of their income from their certified farming members, so it is not in their interest to set standards that were too demanding.

## **7 PROJECT RECOMMENDATIONS**

Realising improvements to the current system should obviously be a priority for the European Commission, Member States and farmers. A shortcoming of the current cross-compliance arrangements is that transparency is rather low and there are no comprehensive reporting requirements for Member States. Thus, evaluation of cross-compliance and assessment of its effects will be difficult. Furthermore, information exchange about the approaches chosen in Member States and experience with implementation, although both helpful and desirable for planning further improvements, is not occurring sufficiently. Such an exchange could also help to develop 'good administrative practice' in the area of definition and enforcement of standards in agriculture.

Figure 1 provides an overview of the evolution of cross-compliance in the First and Second Pillar with some key milestones and sets out some suggestions for future options.



## 8 FUTURE RESEARCH

A Specific Support Action 'Cross-compliance Network' is being supported under the Sixth Framework Programme by DG Research (starting in November 2005 for 14 months). IEEP is leading a consortium of nine research institutes from across the EU (eight of which were the same partners as the previous project). Research issues to be addressed in the background papers and discussed at the seminars include: approaches to implementing compulsory cross-compliance, administrative arrangements for implementation of cross-compliance, design of verifiable standards and their environmental relevance, the relationship between rural development and cross-compliance, approaches to farm advisory systems, the likely effects of cross-compliance on farm management and land use, the impacts of cross-compliance on costs for administrators and farmers, using cross-compliance to discourage land abandonment, methods of realising co-operation with private certification schemes, the likely effects of cross-compliance on agriculture and the environment and the effects of cross-compliance on competitiveness. In these background papers research on cross-compliance to date will be consolidated and priorities for future research will be identified. A summary paper will be compiled to prepare stakeholders invited to a concluding workshop in Brussels at which they will rank research priorities during break-out groups. In addition to these meetings a dedicated web page will be established to maximise communication amongst those analysing, gathering information on or interested in cross-compliance to promote the exchange of information and synergy between activities. Three conference bulletins will also be distributed to over 400 stakeholders to promote an exchange of information amongst stakeholders and publicise the project.

## **Note**

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# Implementation and farmers' participation in agri-environmental schemes: an institutional perspective

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# 1 Brief presentation of ITAES

Agricultural production affects the environment in many ways, generating negative and positive effects. Neither reduction of negative externalities nor simulation of positive ones can be achieved at a satisfactory level on the basis of market activities; there is therefore a need for agri-environmental programmes. They are often considered as a means to both support farm income and comply with WTO provisions. Indeed, there is a shift from price support towards Agro-Environmental Schemes (AESs). However, the results of such schemes have proved difficult to predict, and sometimes difficult to understand in retrospect.

AESs are policy schemes based on a voluntary approach. Contracts are offered to farmers to change their practices or improve their environmental impacts. The eligibility of farms and farmland may be restricted according to farm characteristics, land use or location. According to EU regulations (2078/92 and then 1257/99) the payment is based on the forgone profit or the additional costs of compliance with contract terms. Different territorial levels are involved according to the different tasks of design and implementation. This is obvious for AESs which are co-financed by the EU. Different types of organisations interact: governments, associations and farms. Therefore institutional arrangements and transaction costs are key issues in the success of AESs.

"Integrated Tools to design and implement Agro Environmental Schemes", or ITAES, is a Research Project of the EU Sixth Framework Programme. It mobilises 600 person-months over three full years (2004-2006). The team of partners from nine countries has been assembled to develop an integrated framework for the assessment of AESs, integrating biophysical and socio-economic indicators to support and justify the actions of policy-makers. Farmers' behaviour and institutional arrangements are scrutinised to identify cost-effective schemes.

ITAES identifies the following key-factors of the "reliability and predictability of AESs":

- Technological factors relating farming practices and environmental impacts: Importance of the targeting, reaching a critical mass, and the use of knowledge about them.
- Behavioural factors relating incentives to farmers' participation and compliance levels.
- Institutional factors expressing the social demand and the way in which they are tuned to adjust the provision of environmental services.

The project aims two entangled objectives:

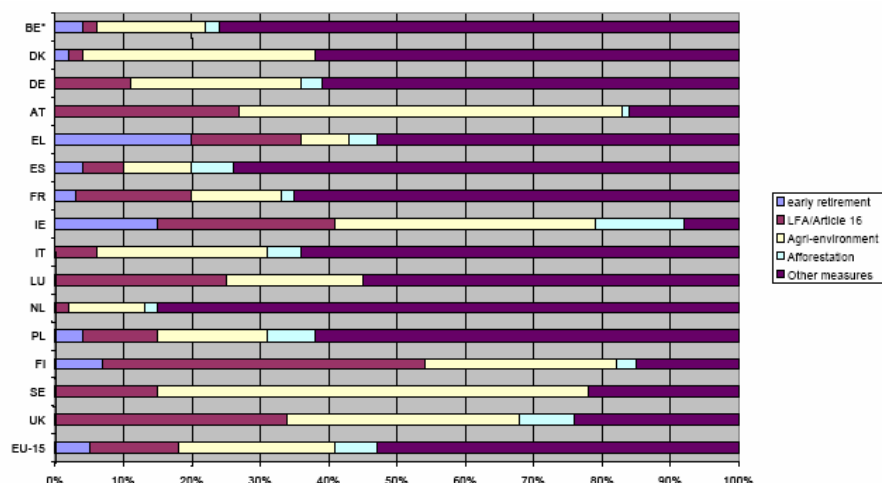
- Build an integrated tool to analyse the interaction between the institutional process and the environmental outcome,
- Build an integrated tool to analyse and simulate farmers' environmental supply, which depends on a range of different governance mechanisms.

## 2 Policy relevance and relevance for New Member States

### 2.1 *Rural development expenditures in EU-15*

AESs consume 50% of the EU-15 budget expenditures devoted to the CAP second pillar; it was 30% of corresponding expenditures in the early nineties. Taking into account the national co-funding expenditures, AESs represent a quarter of total public support of the second pillar.

However, this share differs a lot from a member state to another (Graph 1). Significantly, it is higher than 50% in Austria and Sweden. These countries entered the EU in 1995. Apart from environmental aspects, they use AESs to compensate the former farm support which was ruled out by EU integration. Finland did the same in combination with LFA payments: 95% of Finnish farms participate in AESs.



**Graph 1. Total public support of EU-15 countries for the 2<sup>nd</sup> pillar of the Common Agricultural Policy (2000-2006) (EC, 2005)**

## 2.2 Introduction of AESs in New Member States

The Phare programme was set up in 1989 to support Poland and Hungary. It became after December 1994, the financial instrument of the pre-accession strategy leading ultimately to the accession to the EU. In the initial stages of the transition, the programme focused on providing know-how and technical assistance. Then there was a shift towards investment aid in a number of areas, including the environment. After publication of Agenda 2000, Phare was redirected towards preparing the candidate countries for accession. Two priorities were defined:

- Helping the administrations to acquire the capacity to implement the Community acquis,
- Helping the candidate countries to adjust and develop their industries and basic infrastructures up to Community standards in a number of areas, including the environment.

Two pre-accession funds, ISPA (Regulation 1267/99) and SAPARD (Regulation 1268/99) were established. SAPARD is an agricultural and rural development instrument which enables the EU to assist the restructuring of the farm and rural sectors of the candidate countries (except Malta and Cyprus who benefit specific funds). On 1 May 2004 the new Member States ceased to be eligible for SAPARD funding. SAPARD will continue to operate in Bulgaria and Romania.

Chapter VII of the Accession Treaty completed by Regulations 27/04 and 141/04 defines for the period 2004-2006 a special rural development regime for these accession countries. This regime is mainly based on a new Temporary Rural Development Instrument to support the accompanying measures. New Members States will also have access to the measures available

in the EU-15, but with the important addition of an entirely new scheme for semi-subsistence farms. Moreover, the ceiling for EU contributions is higher than usual at 80%.

For the new Member States, 10 RDPs and 9 Objective 1 programmes will be added for the programming period 2004-2006. For the implementation of the RDPs a new transitional financial instrument has been created under Guarantee section with differentiated appropriations. LEADER + will not have a separate programme, but can be integrated as a measure in the mainstream programmes under special transitional provisions in the Accession Treaty (Commission of the European Communities (2004).

### **2.3 Comparison between former and new Members**

The division of the total agricultural budget available from EU funds to the ten acceding countries (EU-10) shows the emphasis put on the second pillar compared to the former members (EU-15). Although the overall support of agricultural support per hectare is considerably lower in the new members than in the EU-15, available budgets for the rural development plans are comparable (Table 1). Under certain conditions the new Members can divert up to 20% of their rural development allocation to increase direct payment under the first pillar.

**Table 1** CAP budget in the EU-10 and the EU-15

	<b>EU-10<sup>1</sup></b>	<b>EU-15<sup>2</sup></b>
1 <sup>st</sup> pillar spending (million €)	1560.3	38712.6
2 <sup>nd</sup> pillar spending (million €)	1703.3	6855.1
1 <sup>st</sup> pillar spending per ha (€)	40.7	300.8
2 <sup>nd</sup> pillar spending per ha (€)	44.5	53.3

Source: EEA (2004). 1: average figures 2004-2006. 2: average figures 2000-2002.

All measures included in the RDR are very relevant to rural development in accession countries, although they face far deeper socio-economic problems than most regions in the former EU. Rural unemployment and hidden agricultural unemployment is a central challenge for rural development mainly where there are high levels of agricultural employment, especially in Latvia, Lithuania and Poland. Diversification of farms, development of green tourism and environmental protection should offer new job opportunities. But given the scale of the problem, they should only contribute to a reduction of this excess labour. The decrease in rural unemployment will mostly result from the ageing of rural population and people's retirement.

New members have drafted national rural development plans for the 3-year period (2004-2006) based on experience gained from the implementation of the pre-accession SAPARD fund. Agri-environmental schemes are the only obligatory measures over the EU. Although, agri-environmental schemes have been proposed in all accession countries either nationally or in the SAPARD framework, new Members have a limited practice with respect to their implementation.

CAP budget distribution for the new members gives scope for considerable higher relative spending on agri-environmental measures than in the EU-15, although these measures will

compete with a number of other measures for a limited funding. In a number of cases, governments are likely to prioritise schemes directly targeting socio-economic issues such as the semi-subsistence aid or directed towards less-favoured areas. Otherwise, given the complexity of EU procedures there is a risk that the new Members would not be able to spend the total allocated EU budget.

### **3 ITAES Background and methodology**

#### **3.1 *Past research outcomes***

The first generation of agri-environmental schemes (AESs) was based on contractual agreements between the state and farmers who received premiums in return for certain environmental services. The rationale for this was to provide incentives to farmers for a voluntary limitation of farming practices which have a negative influence upon water resources, wildlife and landscape. This policy orientation implicitly acknowledges that farmers benefit from presumptive property rights on the environment. Indeed, through these schemes the taxpayer purchases the public goods provided by farming. Other policies, e.g. cross compliance, could achieve the same environmental benefits, provided that the legal boundaries and reference points defining positive and negative externalities were different (Gatto and Merlo, 1999).

According to the subsidiarity principle, the design of individual programmes was left to the member states or regional authorities. This normally ensures the tailoring of contracts to local conditions and concerns. It is therefore not surprising that, within a common framework, the schemes applied varied greatly from country to country according to local conditions. This diversity is also influenced by the particular historical and social context of member states, and by the culture and traditions of the relevant institutions.

Despite a huge diversity between and within countries, a number of studies, based on the maximisation of farmers utility, have shown that the participation in AESs depends on farm characteristics and the preferences of farm households. Uptake by farmers depends in the first place on the economic incentive offered: the higher the compensation payment, the greater a farmer's willingness-to-accept the required constraints of the scheme. The success of such schemes is strongly dependent upon social context. Indeed farmers are more likely to participate if they know someone who already participates. This a clear indication that networking matters (Dupraz et al., 2003).

Other characteristics of the farm, including size, labour requirements and enterprise type are also significant explanatory factors of farmers' enrolment in agri-environment schemes. For instance, farmers who have woodland on their holdings are more likely to join landscape maintenance schemes, while those with the largest farms are more likely to select extensification programmes. Uptake is also higher among better educated and informed farmers and among those with a positive attitude towards the environment (Morris and Potter, 1995). This indicates that education, information and extension are all important in explaining participation and that these influencing these factors can gradually shift farmers' behaviour (Dupraz et al, 2002).

Positive cost complementarities between different environmental outputs have been estimated (Bonnieux *et al.*, 2001). For an individual farmer cost complementarities may make it profitable to participate in several schemes simultaneously. For a given scheme, the difference between the premium offered and the marginal cost of compliance, depends upon

participation in other schemes. Participation is positively correlated with the level of compensation offered and is conditioned by involvement in other schemes. Cost complementarities may therefore lead to an increase in participation rates, encouraging the provision of environmental goods. Enabling farmers to participate in all available schemes may result in an increase in both private and public benefits. Due to the phenomenon of asymmetric information, farmers tend to capture the majority of the benefits provided by cost complementarities. Therefore, the fine tuning of agri-environment policy is likely to result in a sharing of benefits between farmers and the general public. Theoretically compensation payments can be minimised by a better targeting of policies through tighter specifications of prescriptions, in particular when there is a strong jointness between environmental goods. Complex schemes, however, always involve an increase in administrative costs.

Farmers are highly diverse, and the institutions responsible for the implementation of agri-environment policy may not always hold the relevant information about those of their characteristics that influence participation. Contracts incur direct public costs in compensating farmers, plus information costs. Research effort has been devoted to contract design based on the principle-agent model which takes into account the asymmetry of information between the regulator and the farmer, whereby the regulator is unable to observe precisely the farmer's compliance costs (Moxey *et al.*, 1999).

The total costs of AESs include the compensation given to farmers and transaction costs. The first component is a monetary transfer to ensure the provision of public goods. The second is associated with several processes and are borne by the public agency and the eligible farmers. Public transaction costs include the design and notification of contracts, the promotion of agri-environment policy, implementation, monitoring, and the enforcement of farmer compliance. Empirical evidence demonstrates that these costs can amount to a significant proportion of total public expenditures. Although the success of AESs requires a minimal level of administrative costs, there are opportunities to reduce them. In a sample of British AESs, significant size economies, with regard to the numbers of contractors per scheme, were observed, as well as a significant effect of scheme age in exerting downwards-pressure on administrative costs. These economies derive from the set-up costs of schemes (e.g. design, overhead costs of the implementation agency). The effect of the age of the scheme is related to the administrative learning curve and to economies made over time from fine-tuning procedures (Falconer *et al.*, 2001).

### **3.2 *Scientific and technological objectives***

AESs have developed across the EU since the 1980s in order to encourage the provision of environmental goods, following concerns that agricultural support has led to rising levels of land use intensity, threatening widely-valued characteristics of the countryside. The economic justification for these policies has two principal rationales: first, the existence of externalities, both positive and negative; and second, the public good nature of the targeted environmental goods (such as biological diversity or landscape), the consumption of which is neither rival nor excludable at low cost. Thus, environmental goods are unlikely to be provided through the market at their socially-optimal levels, and existing cost-benefit analyses of AESs have indicated positive net social welfare outcomes (see Hanley *et al.*, 1999). Basically AESs are designed and implemented to ensure that the environmental goods supplied by farmers meets social demand. This objective necessarily includes several interrelated tasks: the expression of this social demand at more or less decentralised levels, the knowledge acquisition of the agri-environmental technology and the design of appropriate policy tools and institutional settings.

The strength and the precision of the social demand function certainly influence both the commitment of public authorities in rewarding actual environmental efforts and farmers' attitudes towards AESs. In contrast the French grassland premium has minimal conservation goals and offers a low level of compensation. This certainly helps the survival of extensive cattle farms in less favoured areas and most of its beneficiaries consider it an additional compensation payment. Although the grassland premium scheme was very successful in terms of farmers' uptake, the incentive it offered was not high enough to prevent further decline in grassland area. In this example, supporting the incomes of a broad category of farmers appears to be a more important, and better targeted, objective than conservation. The Rural Development Regulation (RDR) strengthens the role of AESs as they are, to a large extent, elaborated at decentralised territorial levels. Within this new policy context, local governance structures get greater opportunities and responsibilities. Implementation of the RDR may suffer from inadequate governance structures, especially at the local levels. In many cases, they fail to integrate farmers' individual projects in an integrated rural approach. As a result the resulting contracts reflect the opportunistic behaviour of the farmers who benefit from environmental payments imposing relatively few constraints. Moreover few national and regional institutions, especially agricultural organisations and administrations, are able to capitalize on the experience of the previous AESs.

Targeting specific groups of farmers and taking into account their expectations and limitations can increase the efficiency of a given policy. This suggests that eligibility rules based on farm-related characteristics will result in a higher uptake than rules based on geographical designation. However for a particular area, e.g. a river basin, the aggregate provision of environmental goods depends on the density and location of participating farmers. So, for a valid assessment of AESs there is a need to examine the resulting benefits and set them against the costs of schemes.

Given the non-separability of the provision of some types of public goods, such as landscape, the efficiency of voluntary measures is questionable because it is very expensive to make all farmers comply with protection rules. A first possibility is to offer a very high level of compensation within a standard contract to convince the last farmer to participate. This, in effect, passes rents to other farmers. A second route is to negotiate individual contracts in order to adjust them to farmers' characteristics. This leads to an increase in public transaction costs, particularly negotiation costs. Clearly, there is a trade-off between compensation payments and transaction costs.

As mentioned previously, the administrative structure and tradition of countries is a major influence on the efficiency of AES. However the various facets of implementation, including application procedures, control and enforcement can be assigned to either centralised or decentralised public agencies or even to the private sector. Clarifying institutional responsibilities is important because environmental problems cut across sector boundaries and involve many different agencies and lobbies. In order to minimise opportunities for conflict and to ensure effective co-operation among actors, it is crucial to clearly define institutional responsibilities. Institutional choice is important for the success of a policy and should therefore be based on a careful analysis of costs and effects. It is true that in a given context institutional arrangements cannot be drastically modified but there is some room for making adjustments which may lead to significant changes in the long run.

### 3.3 Research structure

**Table 2** synthetic presentation of ITAES

	Horizontal tasks		Analysis of specific issues		
			Regional level	Scheme level	Farm level
Institutional settings and outcomes of AESs in case-studies	State of the art and methods – 9 country reports on AESs and relevant literature [WP 2, INRA-ESR, Rennes, France, each partner]		Complete description of the case studies [WP 3, INRA-ESR, Rennes, France, each partner] Analysis of institutional arrangements of AESs [WP 4, Humboldt University of Berlin, Germany] Assessment of environmental impacts of AESs [WP 5, TEAGASC, Dublin, Ireland]		
Governance structures and farmers' behaviour	Survey of eligible farmers through standardised questionnaires [WP 8, INRA-ESR, Rennes, France, each partner]		Analysis of private transaction costs through follow-up of farmers, and surveys [WP 6, Ghent University, Belgium] Farmers' preferences about the governance attributes of AESs [WP 7, University of Newcastle-upon-Tyne, UK] The design of agro environmental contracts and farmers' strategic behaviour [WP 9, Wageningen University, Netherlands]		
Integrated analysis of institutions, farmers' behaviour and environmental impacts			Multi-Criteria analysis and recommendations [WP 10, UNIPADU-CONTRAGAF, Padua and Bologna, Italy]		

This project is based on a comparison of nine case-study regions among which success stories and failures will be identified and analysed. Work packages WP3, WP4 and WP10 study the interactions between the institutional and political process of design and both the participation and environmental outcomes of AESs. The way in which social demand is expressed within the design of AESs also determines certain characteristics of their implementation and evaluation. The material provided by previous relevant publications and the RDR mid-term review will be fully used, in the different participant countries (WP2).

Implementation and evaluation of AESs depends on the knowledge of the agri-environmental technology. Compared to food and fibre whose production functions are rather streamlined and well known, the production functions of environmental benefits are often uncertain and site specific. In many cases, farmers fail to master the joint production of environmental benefits any more successfully than the regulation agencies responsible for the implementation of AESs. The distribution of information among institutions, farmers and other stakeholders deeply affects the governance structures of AESs, the related transaction costs and outcomes. The dynamics of information improvement and distribution depends on the design of agri-environmental contracts and the technical support farmers are offered. For instance, farmers' innovation and learning by doing processes are expected to be more intensive when the contracts reward the actual provision of environmental benefits rather than adherence to agricultural practice restrictions. The *ex ante* and *ex post* evaluations of the environmental impact of AESs are often incomplete or they are carried out with different disciplinary frameworks and are not comparable with each other. WP5 aims to construct and test an innovative assessment method, based on a set of selected indicators. This will enable the comparison of AESs targeting similar environmental objectives across the case-study regions. The measurement of public and private transaction costs is another common weakness of AES design and evaluation. The lack of *ex ante* evaluation of administrative costs may jeopardize the success of a scheme, beginning with the farmers' uptake, if the allocated administrative resources are revealed to be inadequate. In France the low and slow uptake of the contrats territoriaux d'exploitation (CTEs) is partly due to observed

administrative bottlenecks related to the design and administration of these individualised contracts. CTEs are multipurpose farming territorial contracts based on a whole-farm approach. They encompass agri-environmental payments and investment aids within a single contract between the farmer and the state. This example illustrates the classical trade-off between precision and transaction costs, and contrasts with the grassland premium. Moreover the average size of the farms that have taken up a CTE is significantly higher than the French average, while the size of the farms involved in previous AESs was lower. This suggests that CTEs are characterised by fixed private transaction costs which are high at the farm level and build entry barriers. This project pays considerable attention to the transaction cost issue since it does not only influence economic efficiency but also uptake and environmental effectiveness. The case-studies of WP3 will gather available information on administrative costs at the level of individual schemes and the region. Administrative costs are analysed within WP4 which compares how the tasks of designing and implementing AESs are allocated and carried out by different institutions.

Based on English and Welsh Environmentally Sensitive Areas, Table 3 illustrates the interactions, when a State Agency is responsible for the design and the implementation of contracts.

**Table 3** Categories of Transaction Costs Incurred in the Implementation of Voluntary Schemes Based on Compensated Management Agreements and Cost Incidence

Main Category	Sub-Category	State agency costs		Participant costs	
		Fixed at the level of the scheme	Variable with no. of participants	Fixed at the farm level	Variable, e.g., with hectares entered
Information	- surveying of the designated area	√			
	- designation of area and designing management prescriptions	√			
	- re-design / re-notification of prescriptions	√			
Contracting	- promotion of scheme to farmers	√	√	√	
	- negotiation between organisation and farmer		√	√	√
	- administration of contract (including making payments to farmers)		√	√	
Policing	- enforcement of farmer compliance		√	√	√
Evaluation	- environmental monitoring and scheme evaluation	√			

Source: Falconer et al., 2001

In fact, it is often the case that several institutions and stakeholders are involved in designing and implementing AESs, resulting in multiple partnerships. These interactions between public and private transaction costs are particularly under-researched. This issue is also interesting for policy makers and farmers' associations. It deals with the design of contractual arrangements, institutional settings and the implementation procedures of AESs. This is why several work packages attempt to fill this gap. Farmer behaviour is studied by WP6 using existing research results concerning farmers' participation in AESs. Here microeconomic and econometric models integrating private transaction costs will be developed and tested. Empirical evidence will be extracted from a survey of farmers in case-study regions (WP8). The survey questionnaire also aims to elicit farmers' preferences about the attributes of AES governance structures. These attributes include contract specification, institutional settings

and enforcement procedures. In different scenarios, alternative contracts targeting the same environmental outcomes as existing contracts will be offered to farmers. These contingent contracts may differ in length and in recording practices, and may be more or less individualised. Payments may be calculated on the basis of observed environmental outcomes rather than of restrictions of agricultural practices. The institutional settings may differ in the nature and number of the implementation agencies (environmental organisation or agricultural institution). Enforcement procedures may differ in the balance between technical support and control, with different levels of sanctions. WP7 develops elicitation methods and the analysis of farmers' preferences. In close collaboration with preceding WPs, WP9 develops theoretical and empirical simulation models taking into account the strategic behaviour of farmers regarding different contractual arrangements, different scheme management attributes and eligibility rules. For instance eligibility may require some minimum level of participation in a designated area, in order to reach a critical mass of environmentally friendly practices. Strategic behaviours, based on asymmetric information and cartel building may deeply affect the uptake and the costs of AESs. The likelihood of such behaviour depends on agri-environmental technology aspects as well as institutional context and contract design.

The final objective of the ITAES is the integration of the three main tools which are presented above: institutional analysis, environmental appraisal and microeconomic analysis. Technically this is the challenge of WP10.

## **4 Preliminary results and comments**

### ***4.1 Institutional innovation in New Member States***

Implementing the CAP in NMS, generally implementing the *acquis communautaire*, leads to institutional innovation. This is particularly true for AESs where the subsidiary principle applies widely. The comparison between Finland and Czech Republic show that the same story repeats itself in a certain extend: A dramatic change in the policy mix applied to the farm sector imposes the AESs as an important tool to support farm income. Horizontal schemes with basic measures and relatively high incentives benefit to most farmers. Their design and implementation involve new collaboration between the Ministries of Agriculture and Environment and introduction of new tools to monitor and enforce the policy schemes.

When new Members joined the EU in 1995, they had to put the *acquis communautaire* into effect at the national level. This has created a shift in agri-environmental policy as illustrated by the Finnish case. Indeed, Finland experienced an original way to deal with the interface between farming and the environment. Before entering the EU, agricultural policy was jointly designed by agricultural administration and farmers' union, this co-decision process being justified by the concept of 'agricultural policy community'. Farmers were acknowledged as the best guardians of the countryside so the philosophy was to entrust them with the protection of the environment.

Several policy measures, including a set-aside scheme, fertiliser taxes and an afforestation scheme, were likely to have produced environmental effects although they were primarily aimed at different objectives. A voluntary set-aside scheme was implemented to reduce over-production. But it was changed into a compulsory scheme in 1991, then farmers had to set-aside at least 15% of their cultivated area. Moreover, they had the opportunity to make an agreement on plant-cover for set-aside area, and an additional compensation was offered to them. A tax on nitrogen fertiliser was collected from 1976 to 1994 as a means to raise funds

for export subsidies. In 1990 an environmental tax on phosphorus fertiliser was also introduced. Both fertiliser taxes were abolished in order to comply with EU legislation and therefore facilitate Finland's membership.

Increasing public concern about detrimental impact of farming on the environment combined with scientific evidence showing agriculture as a serious polluter boosted the design of the first national environmental programme for rural areas approved in 1992. According to this programme environmental issues in rural areas must be considered at the central governmental level, with both the Ministry of Agriculture and Forestry and the Ministry of the Environment in charge. This is a significant change in policy orientation with a shift from the traditional Finnish concept of 'agricultural policy community'.

Despite the implementation of pre-accession schemes, a dramatic change in public policy result from the last enlargement of the EU to Central and Eastern European countries. Related to agri-environmental programmes, this point is illustrated with the Czech Republic case.

From 1954 to 1963, nature policy mainly relied on the designation of areas for landscape protection in the Czech Republic. New concerns emerged in the 1980s and a particular attention was paid to organic farming. An organic scheme was applied from 1990 to 1993 with a support from the Ministry of Agriculture. In 1994, there was a shift of emphasis with the first agri-environmental launched by the Ministry of Agriculture which offered subsidies for applying a series of specific measures. Unfortunately, this programme suffered a number of drawbacks. First of all, eligible farmers were only offered a one-year firm subsidy, with its renewability being subject to budget variations. Secondly, there was no clear and precise specification of the required actions. Finally, weak or missing monitoring and sanctioning mechanisms undermined the enforceability of this programme. In 1999, the installation of the Czech Republic agrarian policy for the 1999-2003 pre-accession period was launched. It put emphasis on agri-environmental issues. A Government decree in 2000, intended to harmonise the second Pillar measures. It embedded less-favoured areas and agri-environmental schemes into a single legislation. Proposed agri-environmental measures included both measures taken from the former programme and new measures. The contract lengths is still short but the package of measures should be available over several years.

The national programme governance was exclusively in the hands of the Ministry of Agriculture. Programme design was at national level while regional offices were responsible of implementation tasks (contracting, monitoring and enforcement). In addition the Ministry of the Environment and its agencies were involved to a very limited extent. A major change which has been associated with the SAPARD programme, was the introduction of a system of evaluation and public control from the 'pre-beginning' to the 'post-end' of projects. A proper specification of monitoring procedures, *ex ante*, mid-term and *ex post* evaluation was henceforth required. This orientation was later strengthened with the preparation of the Horizontal Rural Development Plan. For the SAPARD administration, a temporary system (SAPARD Agency) governed by a Managing Authority at the Ministry of Agriculture was set up. On January 1, 2004 it was moved into a new organisation, the State Agricultural Intervention Fund (SAIF) which complies with EU legislation. This is the only contracting and paying agency for all the CAP support programmes in the Czech Republic.

In SAPARD, the introduction of five-year contracts had an important implication for the farmer choosing a production plan. In contrast to the previous simple and horizontal schemes, the new ones were targeted at pilot areas and were area-specific. Experts from the Ministry of the Environment and from its landscape and nature protection administration (LAPLA) played

an essential part in designing areas and required actions. Otherwise for the national Agricultural Environmental Programme, tasks related to scheme promotion, information, dissemination and technical support are dependent on personal activities of officers of local agricultural agencies of the Ministry of Agriculture. In an effort to favour a public-private partnership in promoting programmes' implementation, both public officers and private advisers were trained by the Ministry of Agriculture.

Thus there was an important change in the governance of agri-environmental policy with a shift from a narrow agricultural perspective to a broader perspective involving environmental interest. Co-operation with the Ministry of the Environment and its conservation agencies should improve the designation of conservation goals and lead to a better targeting of individual sub-measures. In addition, the establishment of the SAIF should contribute to a better policy control and enforcement. Finally, setting up steering and monitoring committees, and involving independent referees in the evaluation process are likely to empower public control over support programmes and to have a potential to strengthen the learning by doing process. One of the main obstacle to high uptake by farmers is the unfinished process of setting agreements between farmers and land owners (in some cases owner was not even known). The second important obstacle was a significant administrative burden on farmers. The SAPARD programme introduced a public discussion but there were no serious comments from the farming community. In pilot areas, for farmers even involved in prescription design (in some areas they have been part of the initial working group) some key misunderstanding remained. Especially confusing is the fact that the farmer could not be supported for nature protection (by extensification of farming) in the places with strict prohibition of use of fertilisers and pesticides. This was the main source of confusion during the implementation period. The same factor caused lower enthusiasm among LAPLA staff in some areas because a significant part of the nature protection issues (land abandonment, etc.) is situated in the most protected localities and therefore it could not be solved by this measure. In general there was quite wide acceptance of the AES by farmers and by the public in these areas.

Since 2004, the horizontal rural development plan (HRDP) is mainly based on pre-existing horizontal measures launched in 2000 (grassland maintenance, organic farming support and conversion from arable to grassland), with the growing of catch crop in addition. Total public expenditures of AESs has tripled with EU accession. The uptake is quite unbalanced between the different measures. Farmers positively react for area paid AESs, like grassland maintenance or growing of catch crops. 800 thousand hectares of permanent grassland from 950 thousand potential have been applied in to this schemes – practically all Czech grassland is under AES now. The derived extensification of farming practices in such a large scale may be in contradiction with the national policy goal of maintaining employment in agriculture. It seems that some really big farm holders (10 – 20 thousand hectares) are receiving so heavy subsidies, that it is not relevant to re-invest them to agriculture, but they are willing to invest this money to other parts of the economy. Large farms have basic problems to apply for landscape diversification schemes, because there is a relationship to numerous land owners and it is administratively complicated for the big farm management.

#### ***4.2 Participation in AESs and transaction costs***

Whatever the measure, the calculation of AES contract remuneration is based on the assessment of the forgone profit or the additional cost related to the implementation of contract prescriptions. When this assessment is correct the uptake should be rather predictable. This is not true in most cases. An assumption to be tested in ITAES is that private transaction costs are not taken into account while they are not negligible and may deeply

affect participation in AESs. A number of tools are used to measure these private transaction costs and their impact on participation. The survey of farmers collects a number of variables to assess the determinants of private transaction costs which are related to farmer characteristics and situations: information level, involvement in professional networks, trust in administration, relationships with extension services. The questionnaire of the survey also includes a choice experiment part which elicits the value of alternative contract attributes, like the contract length, the flexibility of contract prescriptions, the additional administrative burden of the possibility of choosing the land to be contracted. While the choice experiment elicits transaction costs perceived by contractors and non contractors respectively, a one-year follow-up of more than one hundred farmers is undertaken in order to record actual transaction costs born by contractors.

The following preliminary results are obtained in Basse-Normandie (NUTS 2 region of France) using a sample of 326 farmers, among which 52% are contractors. Contractors were voluntarily over represented. Like in Czech Republic, the extensive management of grassland and the winter coverage of arable land are the two most contracted measures. However less than 10% of eligible area is under contract.

The choice experiment was designed to value five governance attributes of the contract including the payment per hectare which is needed to calculate the monetary value of other attributes. Every respondent had to make four successive choices between two fictive contracts which on differs in some levels of the attributes; technical prescriptions are unchanged across alternative contracts and are based on a real agro-environmental measure of reference. A sixth attribute corresponds to the situations where the respondents preferred the reference (real) contract rather than any proposed alternative (fictive) contracts. Assuming a random utility model, the answers are processed by a multinomial logit. The design of the sets of choices ensure that the assumption of independence of irrelevant alternatives is respected. All attributes are significant (Quinio, 2005). Table 4 illustrates the results in term of willingness to accept (WTA) a specified change in the attribute level. It expressed in percentage of the reference measure payment. The WTA is the minimal increase in the annual payment per hectare which maintains the farmer's utility, given the specified change.

**Table 4** Choice experiment results in Basse-Normandie (France)

Change in governance attribute level	Willingness to accept	
	Contractors	Non Contractors
Contract length increases from 5 to 10 years.	19%	20%
The pieces of land which are contracted are imposed by the AES agency rather than chosen by the contractor.	11,2%	10,8%
The technical prescriptions are partially adaptable at the farm level rather than fixed (flexible rather then rigid contracts).	-11,1%	-4,8%
The paper work increases from 45 to 90 minutes per month	5,4%	2,8%
Status Quo (the real measure is preferred)	4,0%	8,5%

Source: Quinio (2005) based on ITAES survey.

The respondents would accept an increase in the contract length from 5 to 10 years, meaning they would maintain their participation level in the AES, for a 20% increase of the payment. An 11% increase would be necessary to impose which pieces of land are to enter the AES.

The results show that the contractors marginally value flexible contracts and the paper work twice as much as non contractors. These differences probably come from the experience of the contractors who resent more the paper work and the prescription rigidity than non contractors. The status quo estimated values show that both contractors and non contractors reject the existing contract. Consistently, the respondents who did not actually signed this contract have a willingness to accept higher than contractors.

This results only give a partial picture of private transaction costs. For instance, AES attributes related to control procedures and sanction levels are not values. However they prove that governance attributes significantly affect the farmers' attitude with the expected signs.

Using the ITAES survey data base, synthetic continuous variables were built with the correspondence analysis on relevant subsets of qualitative questions respectively related to

- the farmer's knowledge about AESs,
- his involvement professional organisations,
- the frequency of his relationships with extension services,
- how difficult he perceives the relationships with administrative bodies,
- his trust in administrations.

The unit of the synthetic continuous variables is arbitrary and does not represent anything, but their range represents the variability of the sample for the corresponding items. Preliminary results show that all those synthetic variables, except the trust in administrations, are highly significant to explain the probability of participation in AESs (Granval, 2005). In particular a 10% increase in farmer's knowledge about AESs or in the frequency of relationships with extension services has an higher effect than a 10% increase in the contract payment. A 10% increase in organisation involvement or in easiness of relationships with administration has an effect as large as a 10% increase in the contract payment. These results have to be confirmed and certainly reflect the well known complexity of French schemes. However they show that private transaction costs are far from being negligible. They are contracting barriers which select contractors and AES land without any *a priori* environmental relevance.

## **5 Policy orientations and environmental effectiveness**

The importance of AESs highly depends on the national constraints and strategies about farm income support. Nevertheless the AESs introduce new actors, like the Ministry of Environment and NGOs, in the design process of agricultural policy schemes. EU regulations also introduce better governance principals, such as control, scheme monitoring & evaluation in old as well as in new member States. The compliance with better governance principals may increase public and private transaction costs. This is an incentive for member States to design large scale and simple schemes, in contradiction with an increasing role of local initiative which is promoted by the proposal of the next rural development regulation, based on the "leader" approach.

For AESs, the environmental effectiveness remains questionable. Even in Finland where 93% of farmland are under contract it is difficult to say if the actual decrease in nitrate and phosphorus runoffs are due to AESs or to the decrease in agricultural prices. In addition no impact on lake eutrophication has been measured yet. The situation is probably worse for schemes with numerous different measures, low uptake rate and geographic dispersal of lands under contract. In most cases the cause-and-effect relationships between the prescribed farming practices and the stated environmental objectives are not documented. This is certainly a field where exchanges of experience and knowledge accumulation should be

enhanced. This is a big challenge in a framework where bottom-up approach and decentralisation prevail.

## Note

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# Tools for spatial impact assessment of multifunctional land use

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## Abstract

*The principle of multifunctionality considers simultaneously a variety of social, economic and environmental goods and services related to land use. It is thus a key to sustainable development of land and rural areas. Land use policies seek to support the economic competitiveness and sustainable development of rural areas. For an efficient Impact Assessment policy makers require tools for assessment of anticipated policy impacts on a wide range of sustainability issues across European regions. The European Union funded Integrated Project **SENSOR** develops ex-ante Sustainability Impact Assessment Tools (SIAT) to support decision making on policies related to multifunctional land use in European regions. SENSOR directly responds to the European sustainability objectives as applied to land use and rural development.*

*This paper provides an overview on the analytical approach in SENSOR and documents preliminary results. This includes the identification of end user needs for SIAT and the development of a first SIAT prototype. Methodological frameworks for scenario development and land use modelling including indicator analysis and web-based data management were established. Surveys of European sensitive areas and a regional spatial reference framework for socio-economic and environmental assessment were drafted.*

## 1 Introduction: Project objectives, scientific and policy context

The **SENSOR** project aims at delivering ex-ante *Sustainability Impact Assessment Tools* (SIAT) to support decision making on policies related to multifunctional land use in European regions. This responds directly to European sustainability objectives (EC 2001) as applied to land use and regional development as well as to better regulation and policy targeting.

**Sustainability Impact Assessment** (SIA) seeks to identify possible economic, environmental and social effects of a policy agreement and its consequences with respect to sustainable development before and during negotiations. This is manifested in the Commission's Communication on Impact Assessment (EC 2002) which introduced an internal process of impact assessment for major policy proposals in all policy areas. This new Integrated Impact Assessment process is thought to streamline, substitute and integrate all existing separate impact assessment mechanism, including sustainability impact assessment.

The EC responded with this systematic process to its Goteborg commitment to implement Sustainable Development and to establish an instrument for impact assessment and to its commitments on the Laeken council (EU Better Regulation Action Plan (EC 2002)) to implement

better regulation principles including a regulatory impact assessment mechanism (Tamborra 2002). The EU strategy for Sustainable development was revised in December 2005 (EC 2005) and further renewed. The actual EU Sustainable Development Strategy (EU 10917/06) as adopted by the European Council in June 2006 reinforces explicitly the importance of high quality Impact Assessment as a tool for better policy making. It outlines that all EU institutions should ensure that major policy decisions are based on proposals which underwent an Impact Assessment anticipating in a balanced way the social, environmental and economic dimensions of sustainable development. The document additionally strengthens the importance of collaboration with partners outside the EU to meet the long standing commitment to global sustainable development (Council of the EU, DG1, 10917/06 EU SDS 2006).

The two main drivers behind the impact assessment procedure of the European Commission are the EU Sustainable Development Strategy focusing on the assessment of policy impacts on the economic, social and environmental dimension including trade offs, and the better regulation agenda stating initiatives to promote effective and efficient regulation in parts to also fulfil the Lisbon objectives of a competitive European economy (Franz and Kirkpatrick 2006).

The implementation of impact assessment procedures involves a variety of methods including stakeholder inclusive approaches and quantitative modelling. Regarding the latter, a lack of adequate integrated and operational tools has been identified (Tamborra 2002). Current tools are mostly designed for ex-post analysis or, if ex-ante, are often restricted to qualitative information and/or addressing isolated aspects of economic, social or environmental impacts. Existing ex-ante tools, which are frequently applied for policy design, are strongly biased towards economic costs and benefits, with a minor focus on social and environmental sustainability issues (Bartolomeo *et al.* 2004). The EU research project SENSOR was designed to develop ex-ante impact assessment tools for the specific case of multifunctional land use, which integrates quantitative tools and qualitative information towards a scenario based indicator assessment model.

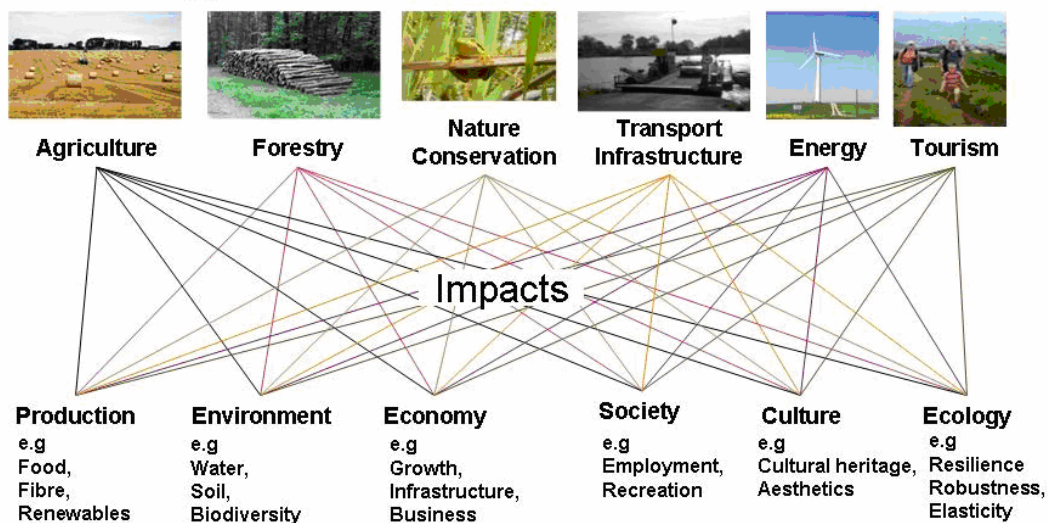
During the last decade, the concept of **multifunctionality** has evolved as one key concept to implement sustainable development in the area of agriculture and land use (Wiggering *et al.* 2003; Durand and Van Huylenbroek 2003; Cairol *et al.* 2005). The underlying rationale for multifunctional land use is to consider social, economic, and environmental effects of any land use action simultaneously and interactively, to include those of commodity production and those of negative and/or positive externalities. These effects are linked to “functions” or “goods and services” in the landscape context, which cover aspects of production, regulation, habitat and information (Costanza *et al.* 1997; De Groot *et al.* 2002). The multifunctionality of any land use action then lies in the degree to which it affects these functions, and hence the delivery of value to society (Figure 1). Societal values themselves are subject to change, for instance as a result of advancing scientific knowledge or in response to cultural change. Technological supply of consumer goods bears no simple relationship to human betterment (Jackson and Marks 1999; Burgess 2000) so that societal values are ephemeral and need to be examined in context rather than assumed. Option and bequest values need also to be considered although not (yet) being explicitly addressed by society. Thus, multifunctionality is not an absolute term describing the outcomes of any land use in a specific bio-geo-physical setting, but is rather a description of the relation between functional performance of land use on the one hand and societal demands for these functions on the other hand (Barkmann *et al.* 2004; Potschin and Haynes-Young 2005). As a result, multifunctionality is dynamic in space and time according to the bio-geo-physical and socio-economic settings as well as to the demands of society. Consequently, sustainability of land use can only be defined in a specific space and time scale. The SENSOR approach is based on this multifunctionality concept.

SENSOR integrates three key assessment streams: (1) European-wide, indicator-based driving force and impact analysis of land use policy scenarios; (2) region specific problem, risk and threshold assessment making use of spatial reference systems and participatory processes; and (3) case study based, exemplary sensitive area studies in mountains, islands, coastal zones, post-industrialised areas using detailed information on specific sustainability issues. Data management systems and institutional analysis approaches complement these assessment streams.

SENSOR provides protocols for the assessment of policy options affecting land use at regional scale (NUTS2/3) for European member states and based on pan-European existing data. The assessment results are incorporated into the SIAT with a modular structure to allow for different combinations of applications regarding land use sectors and/or sustainability issues and ranging from purely indicator-driven, top-down impact assessment to fully participatory approaches of sustainability target identification and risk assessment.

SENSOR considers policy instruments that affect land use in relation to six economic sectors: agriculture; forestry; tourism; nature conservation; transport and energy infrastructure. The list of regional sustainability issues addressed include spatially explicit environmental functions (abiotic and biotic resources including soil, water, air, biodiversity), societal functions (social welfare, gender equity and migration, cultural heritage, recreation, aesthetic issues) and economic functions (employment, growth). In Fig. 1 land use sectors and impact issues addressed in SENSOR are illustrated. Externality valuation and the analysis of interrelating effects of different land use sectors are also included.

## Land use types



## Land use functions

König et al. 2006

**Figure 1:** Land use sectors and impact issues in SENSOR

## 2. Analytical approaches and first results

### 2.1 European land use scenarios and impact assessment

This component deals with a European scale analysis of future scenarios for general socio-economic trends and specific land use policies. These scenarios are translated into possible land use changes, of which the impact on sustainability issues is analysed with indicator based methods. The objectives of this component are:

- To develop methods to analyse the performance of policy scenarios on land use change and their outcome on sustainability issues for European regions;
- To test these methods using a series of baseline and policy scenarios, and
- To provide protocols for future policy analysis and integration of methods into the SIAT.

Three scientific tasks have a prominent position: firstly, the integration of macroeconomic and sectoral modelling in the framework from scenarios to land use projections; secondly, the inclusion of multifunctional aspects of land use and management in the analyses and projections; and thirdly, the use of these projections to forecast impacts on social, economic and environmental indicators.

The analysis consists of three steps: (1) scenario development of land use driving forces, (2) model-based translation of driving force scenarios into land use scenarios, and (3) impact assessment of land use changes on sustainability issues. Progress on each of these three steps is described herein.

In step 1 (scenario development of land use driving forces) three baseline scenarios were constructed based on the state-of-the-art literature: one – called the reference scenario - based on the extrapolation of existing trends (or on most likely developments, where simple extrapolation is considered unlikely), one high-growth, and one low-growth version. In the scenario storylines, five drivers are considered, namely demographic change, the participation rate in the labour force, world economic growth, the world oil price, and expenditure on research and development. Three additional drivers, namely policies, institutions and cultural preferences are kept constant in the baseline scenarios, but are to be considered through policy scenarios and sectoral analyses, respectively.

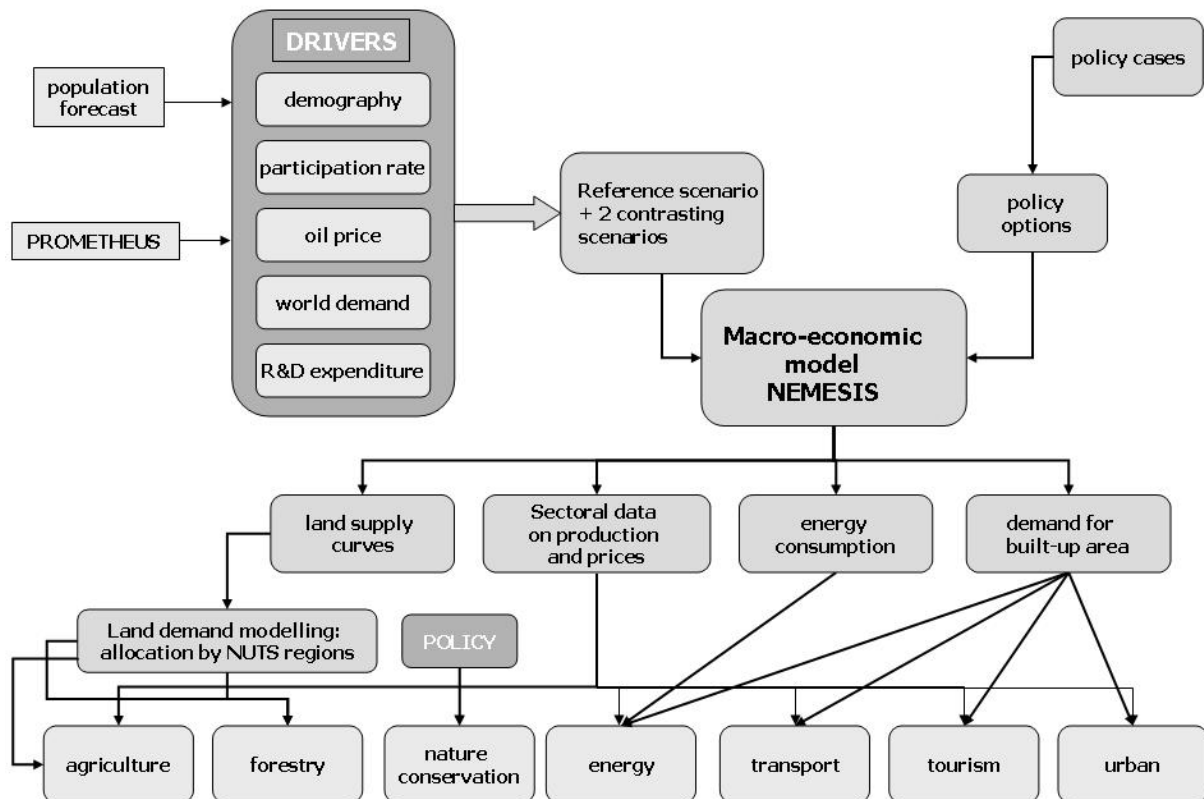
These scenario assumptions serve as input for macro-economic forecasts, which are made with the model NEMESIS (Fougeyrollas *et al.* 2001). This model needs to be adapted for the EU-25 countries and for the six sectors studied in SENSOR.

The baseline scenarios serve as counterfactuals to assess the impact of policies. In order to define the latter, policy scenarios must also be constructed. This will be done by identifying a number of policy cases, covering the spectrum of the six sectors (but one case may affect several sectors). Each of these policy cases will represent a theme around a particular policy objective, and will contain one or more policy instruments. In the application of these instruments, several policy options are possible, and these policy options define the policy scenarios. On the basis of the outcomes of these scenarios, the end user can construct his own scenarios with variations on the same instruments. A three-dimensional matrix is employed, consisting of policy objectives, land-use sectors and policy instruments, around which the policy scenarios will be designed.

In step 2 (model-based translation of driving force scenarios into land use scenarios) a series of sectoral models and knowledge rules is employed to break down the scenario based economic forecasts into scenarios of land use distributional changes at regional scale. On the one hand, this task involves the interaction of a number of sectoral analyses. On the other hand, a spatial disaggregation of information and land use projections from national to

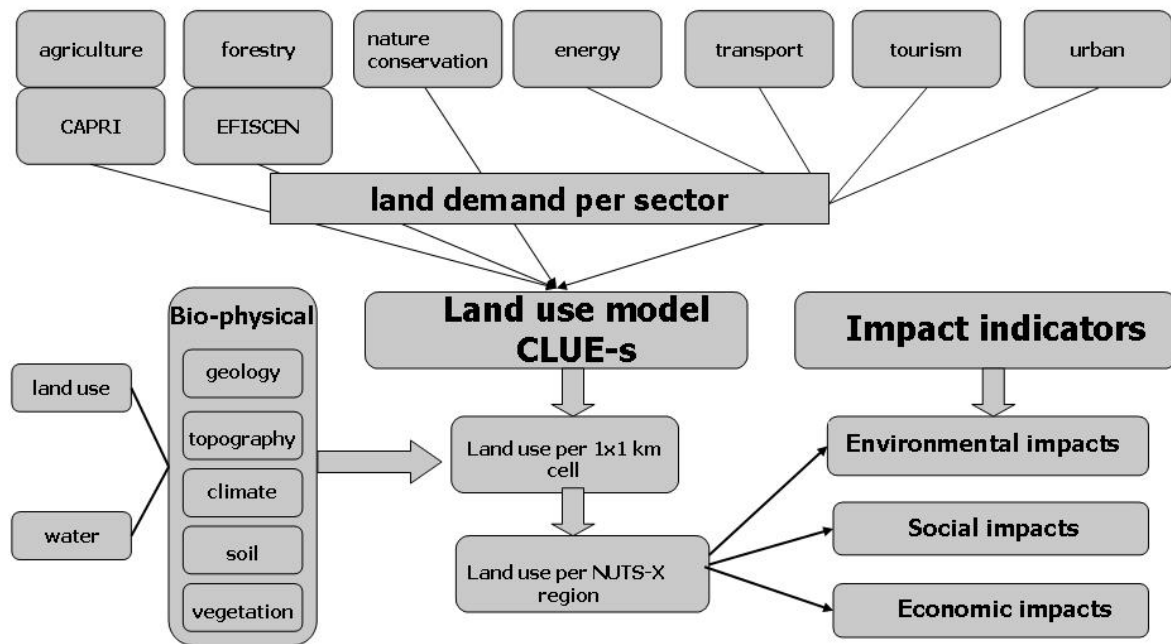
regional level is required. For environmental assessments, a one km<sup>2</sup> grid resolution of land use simulation will also be conducted with the CLUE-S model (Verburg *et al.* 2002).

Regarding the sectoral analyses, only two of the six sectors (agriculture and forestry) can be analysed with quantitative models, namely CAPRI (Heckeley and Britz 2001) for agriculture and EFISCEN (Karjalainen *et al.* 2003) for forestry. Knowledge based rules are employed for the cases tourism, transport and energy infrastructure to translate socio-economic trend scenarios into projections of land use changes. The nature sector will be treated as policy-driven so far as land demand is concerned.



**Figure 2: Scenarios and macro-modelling in SENSOR**

Step 3 (impact assessment of land use changes on sustainability issues) consists partly of identifying sustainability indicators and linking them with scenario outcomes, and partly of designing an accounting framework for externalities. These tasks have only been conceptualised and initiated during the first year of the project. The conceptual design is illustrated in Figure 3 below. A framework for indicator identification has been developed. It takes a starting point the EU Impact assessment Guideline (EC 2005) and the existing indicator sets and frameworks. The guidelines describe the IA process in 6 steps from “identifying the policy problem” to “monitoring and evaluation”, of which step 4 “analysing policy impacts” is related to SIAT. The annex to the guidelines includes a list of about ten relevant sustainability issues for each of the three sustainability dimensions. It was agreed to work with this framework, while keeping in mind that changes in various elements of the framework e.g. the impact issues are foreseen at a later stage in the project. The framework has served its purpose of harmonising the indicator work within the SENSOR project. It is available at [www.sensor-ip.eu](http://www.sensor-ip.eu).



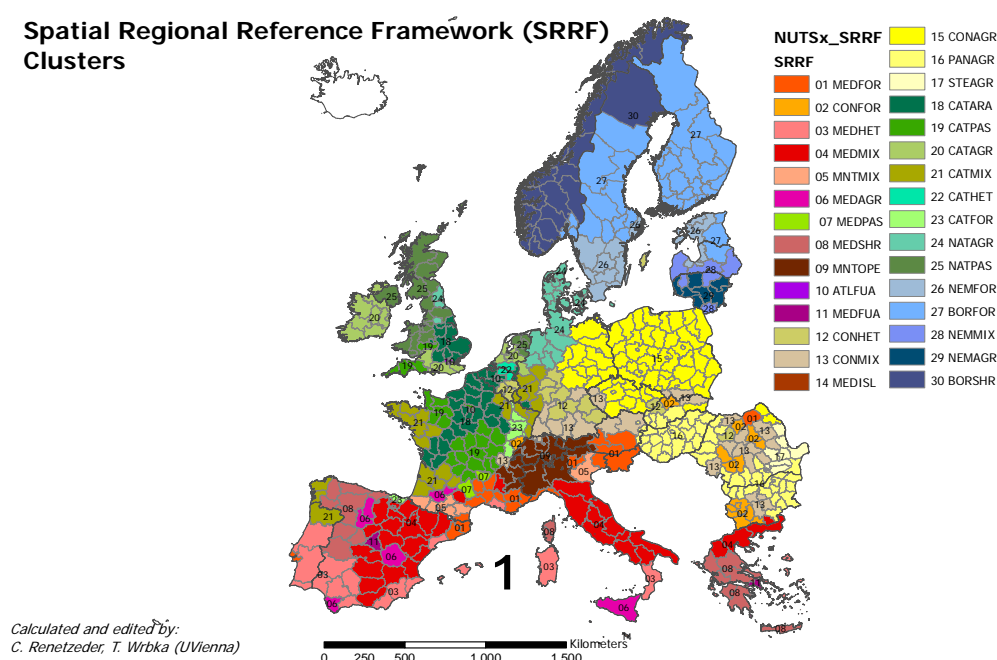
**Figure 3:** Indicator based land use impact assessment in SENSOR

## 2.2 Regional sustainability problems, risks and thresholds

This component is designed to assess regional dimensions of the indicator-based impact assessments (see section 3.1) by developing and making use of a *Spatial Regional Reference Framework* (SRRF). The framework provides both scientists and stakeholders with region-specific information on rurality, urban structure, socio-economic profiles and landscape character information for (1) each of the EU's administrative units (475 so-called NUTS-X regions, a spatially homogenised combination of NUTS 2 and 3 regions) and for 30 relatively homogenous clusters of these regions. The assessment of thresholds and risks for regional impact issues is to be based on the identification and regional specific analysis of environmental and socio-economic 'land use functions'. Since politically established targets and scientifically supported thresholds are rather limited, the research explores various techniques of assessing different degrees of risk for regional sustainability in relation to land use functions and other criteria. This assessment will result in the identification of Sustainability Problem Regions, namely such European regions where existing thresholds are expected to be passed. Researchers develop and improve their methodologies in about 8 concrete (pre-selected) Test Regions, in which the threshold and risks assessment is going to be re-evaluated and verified with the help of stakeholders.

Regarding the development of the Spatial Regional Reference Framework (SRRF), a literature and data review had been conducted at the European level, which resulted in a methodology for selection and adequate levels of aggregation as well in the selection of input maps (shape-files on population density and functional urban areas). Based on this selection, a

clustering of regions on the basis of social, economic and environmental information was performed, resulting in a prototype map of the SRRF. One of the key functions of the clustering of regions was the reduction of spatial and contextual complexity, hence to reduce the high number of administrative units and to find ways for scientifically adequate aggregation levels. One important consideration was the split between relatively constant geophysical aspects and dynamic social and economic aspects. Based on this approach, a clustering was performed, which integrates geophysical conditions (climate, topography, parent material) with indicators on the social and economic state of regions (population density in 2003, population annual change rate 1998-2003, activity rate, GDP index, unemployment rate, Functional Urban Areas with > 500000 inhabitants). Information on these parameters were derived from Mücher *et al.* (2003) and from the ESPON data base ([www.espon.eu](http://www.espon.eu)). The result is a cluster map which combines EU administrative units into 30 cluster regions grouped by attributes related to rurality/urbanity and geophysical characteristics (Figure 4).



**Figure 4:** Result of a clustering of 475 European NUTS2/3 regions in 30 cluster based on geophysical and socio-economic state parameters (Renetzeder *et al.*, 2006).

### 23.3 SIAT integration and end user tools

The SIAT lays emphasis on simulating future scenarios. Thus, the procedure on how to define a scenario and how to solve the stepwise simulation run represents the heart of the tool.

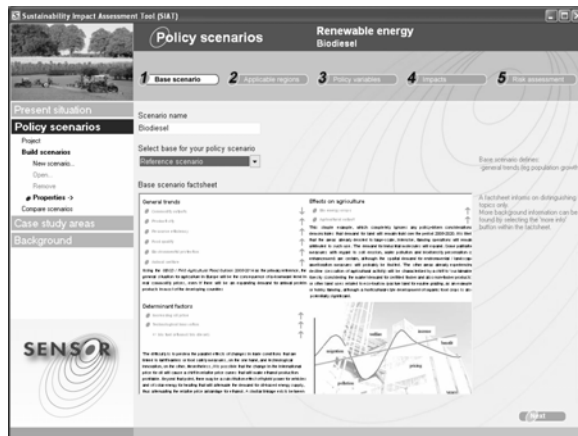
The presentation sheets (Figure 5-8) are derived from the first prototype and show the procedure on the basis of a “bio-diesel scenario”. This scenario example consists of subsidies for bio-diesel production. The case shows that only those regions with a well developed infrastructure and good agricultural production conditions will gain in bio diesel production and therefore benefit from those subsidies. Less favourable regions will only gain in case of

extremely high levels of subsidies.

A complete scenario comprises five steps: (1) base scenario, (2) applicable regions, (3) policy variables, (4) impacts and (5) risk assessment.

### *Step 1, base scenario*

The first step (1) defines the macroeconomic reference scenarios to compare results of different policy scenarios. The results of these reference scenarios are projected to the same target year 2015 and 2025 of the policy scenario runs. SIAT distinguishes the reference scenarios: “business as usual”, high-growth and low-growth (see section 3.1).



**Figure 5:** Screenshot of step 1 (base scenario) in the SIAT prototype

### *Step 2, Applicable regions*

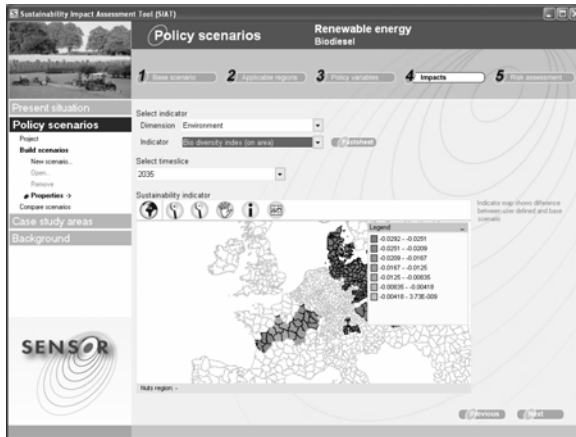
Once the reference run has been chosen, the next step (2) allows the end user to select the applicable regions for the policy measures. This ranges from single regions within particular countries to the full range of all 475 regions of the 25 European member states.

### *Step 3, Policy variables*

Step number (3) is the definition of policy measures expressed by policy variables. The user can choose from a wide set of sector- and policy-related policy variables.

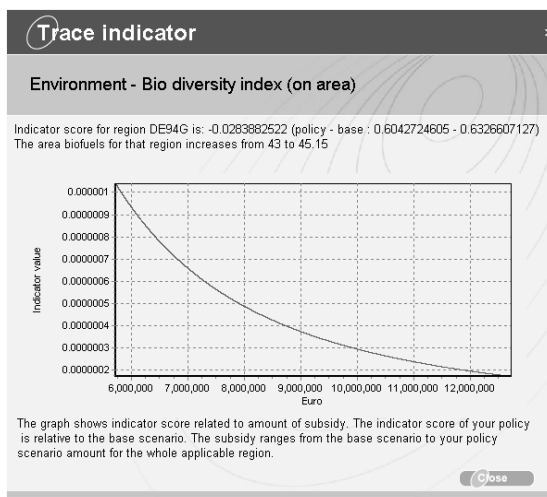
### *Step 4, Impacts*

Step number (4) investigates the impact results of the introduced policy variable “average subsidy renewables”. SIAT shows in which regions the renewables production was increased. In this case below the production increased only in those regions, in which the infrastructure for rape production is well developed and where high shares of rape already existed. Only in case of a very high amount of subsidies for renewable energies other less favorable regions will participate. Biodiversity changes as impact of increased renewables production is illustrated in the screenshot of fig 6.. The biodiversity indicator is an easy compound of the local distribution and equal distribution of crop shares per region and indicates a potential of biodiversity change.



**Figure 6.** Screenshot of step 4 (impact indicators) in the SIAT prototype

The relations of biodiversity and land use changes caused by renewable subsidies are explained in detail in so called fact sheets, which are available in SIAT for all information for transparency purposes. By pointing at a region SIAT shows which rules were used to determine the impact indicators and how the outcome of an impact indicator value was assessed (see Figure 7 for examples).



**Figure 7.** Screenshot of a fact sheet illustrating the methodology of indicator assessment in SIAT

### Step 5, Risk assessment

Step number five (5) is the sustainability impact assessment which is based on region specific indicator thresholds.

When finalised, SIAT will contain procedures for about 60 impact indicators to be analysed as a result of land use policy options. Methodologies include both, qualitative and quantitative approaches and integrate regional specific target and threshold values. A procedure for scenario comparison will also be included.

## 2.4 Integrated data management

Substantial amounts of environmental data sets have been collected over the past few decades and are already available at many sites around Europe. However, exploring the data and performing analysis to discover associations between spatial patterns and environmental phenomena is difficult. The typical problems are related to having large amounts of data stored at different locations, in heterogeneous formats and systems and subject to different data policies with regard to free access to the data. The general situation on spatial information in Europe is one of fragmentation of data sets and sources, gaps in availability and a general lack of harmonisation between data sets at different geographical scales. These problems make it difficult to identify, access and use data that, in principle, is already available. The expanding data resources require a comprehensive scientific data management infrastructure to support analysis of sustainability oriented decisions.

The objectives of this component is to develop a GIS-based, quality assured and harmonised data management system for sustainability impact assessment of land use, which (i) satisfies end-users needs, (ii) can be employed for regional assessments at EU25 scale beyond the lifetime of the project, and (iii) is compatible with major data gathering and data management initiatives such as GEO (<http://earthobservations.org>). This includes a framework for indicator sets and criteria for indicator selection ensuring a harmonised approach across the SENSOR project and indicator sets covering the environmental, social and economic dimensions of sustainable development.

A metadata profile compatible with ISO 19115 has been defined and a metadata reporting system has been developed. This Metadata service is available from <http://systemsresearch.ac.at/sensor/webapp/>. An overview and analysis of the relevant data types, possible data sources and the character and status of data was made. This formed the basis for development of a metadata profile for all types of project data including guidelines for its use. Methods for cross-referencing, consistency checking, consolidating and scaling of data were described which together with the metadata information comprise the quality assurance of data.

## 2.5 Sustainability issues in sensitive regions

A European survey will provide the geographic identification and an overview on environmental, economic and social issues in sensitive regions. In addition, a set of case study areas will be selected and data and information gathered for testing the SIAT and involving stakeholders for valuating determined impacts. Sensitive regions currently under focus are (i) post-industrial zones, (ii) mountainous areas, (iii) islands, and (iv) coastal zones. Information from sensitive regions and case study areas allow to identify both common and specific key problems of sustainability and related impact issues. Beyond, it will provide an in depth analysis of relevant information and expert knowledge on social, environmental, and economic key issues in case study areas.

The first step of this project component was to develop a protocol for creating a web-based pan-European survey on sensitive areas which informs about impact issues, indicators and related meta-information for the ex-ante impact assessment of sustainability key issues. This protocol includes:

1. Geographical identification of Europe's sensitive coastal areas, islands, mountainous regions, and post-industrial zones,

2. Literature review to identify sustainability issues and data sources, e.g. based on Corine land cover, EUROSTAT and EEA reports,
3. Assessment of secondary data availability relevant to identify key sustainability issues at intra-regional and cross-regional level,
4. Data collection on key issues in sensitive areas, based on the impact issues identified by the European Impact Assessment Guidelines
5. Consultation with relevant stakeholders with regard to their view on sustainability issues in sensitive regions throughout Europe,
6. Simple web-based questionnaire to collect qualitative and (semi)quantitative assessment of key sustainability issues,
7. Statistical analysis and clustering of sensitive regions based on available indicators to create classes of coastal areas, islands, mountainous regions, and post-industrial zones with similar environmental, social and economic characteristics.
8. Generation of maps showing key issues of sensitive areas,
9. Drafting of four sub-surveys, and
10. Compilation of the sub-surveys into one final report for the validation of the 4 sensitive areas types (coastal areas, islands, mountainous regions, and post-industrial zones) and 7 case studies (Estonia, Malta, Lusathia, Silesia, Eisenwurzen, Wallis, High Tatras) in SENSOR.

This protocol is a prerequisite for an explorative analysis for the selection of case study areas and for information and data required for testing the SIAT. The review of the literature on key issues and data sources in sensitive regions refers to the CORINE 1990 and 2000 land cover and biotope, EUROSTAT and EEA, Natura 2000. The work includes close consultations with relevant stakeholders on key problems of sustainability issues at regional levels. A simple web-based questionnaire has been designed for collecting qualitative and (semi)quantitative information to be used for statistical exploration and for clustering of sensitive regions with regard to shared impact issues and related indicators and thresholds for similar environmental, social and economic characteristics.

## 2.6 Participatory Processes and Institutional Analysis

This project component aims to analyse sustainability issues, and the institutional role of the SIAT, to make recommendations for SIAT design in collaboration with the other components, and to evaluate the prototype SIATs in real world contexts. This is the component where 'society' is fully integrated into the science of assessment of the sustainability of multifunctional landscapes. The main task is to supply social science expertise including stakeholder analysis, institutional analysis, deliberative processes and quantitative and qualitative social research. The social science programme recognises two strands of research:

1. Extensive and essentially quantitative, based on the need to *consult* stakeholders
2. Intensive and qualitative, based on the need to engage stakeholders in deliberative debate.

In both cases the need for contact with stakeholders (at EU, and regional scales) is in 3 parts:

- (i) Scoping and framing the problem: The design and operation of the Integrated Assessment Tools must emerge from dialogue with end users to establish their policy requirements: What are the problems they face that cannot be resolved through the application of existing tools? How would they use a new set of tools? What do they see as the major risks and benefits of future decisions with and without such tools? The scientists' role in this dialogue is to explain the capacity and the constraints of

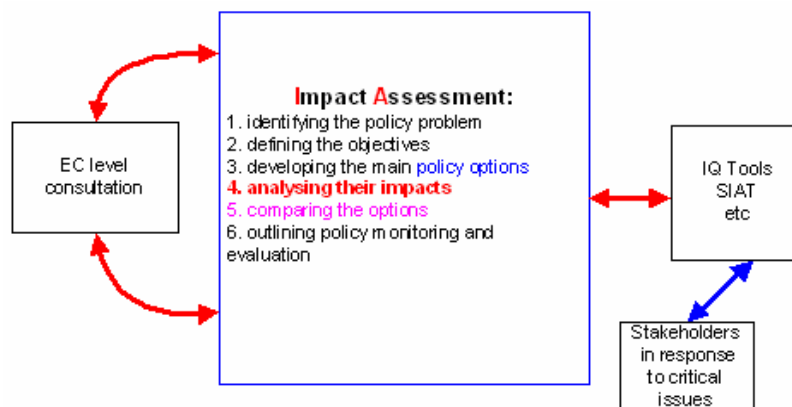
their existing tools; and to illustrate how new science (in SENSOR) hopes to meet these challenges.

- (ii) Design and testing of components of the new SIAT: The development of the integrated assessment tools will be iterative, engaging with key actors /stakeholders to road test elements of the work and fine tune as it progresses.
- (iii) Full evaluation of the SIAT in real world contexts: Once the model is delivered, it must be evaluated practically in the context of specific land-use decision situations, involving the appropriate stakeholders. The evaluation will be conducted by members of SENSOR together with external evaluators.

During the first project *phase* the objective covered was to scope and frame the problem addressed by SENSOR through participatory processes and institutional analysis. This has been achieved firstly through protocols of stakeholder and document analysis. Stakeholder analysis, document analysis, meetings and semi-structured interviews were used to develop an understanding of the needs of end-users and the role of Impact Assessment (IA) and SIAT, as a basis for providing advice on SIAT design. Initial progress was made at EC level in identifying end-users.

For the local and regional stakeholders, discussions were initiated to identify stakeholders in case study areas. A generic list of stakeholder groups was subsequently prepared as a basis for stakeholder identification and analysis.

Document analysis revealed the developing IA process in the EC “Impact Assessment Guidelines” (EC, 2005) as the utmost important document for Impact Assessment procedures. The role of the Impact Assessment process was investigated through 20 semi-structured interviews, mostly with EC officials, which enabled us to understand the role of SIAT in relation to this process. Accordingly, SIAT and comparable tools (e.g. IQ-Tools, <http://www.sussex.ac.uk/spru/1-4-7-1-3.html>) are required to cover step 4 of the Impact Assessment process (Figure 8).



**Figure 8.** *SIAT in relation to Impact Assessment*

### 3. Conclusions

SENSOR is a four year project designed to develop *Sustainability Impact Assessment Tools* (SIAT) of land use for European regions. The various disciplinary approaches, analysis scales as well as the complementarity between quantitative, indicator-based analysis and partly

qualitative, stakeholder driven approaches make the project very complex. However, all components of the project are to be integrated into the SIAT product.

This paper provides an overview of the analytical design of the project and on some of the results achieved during the first project phase. Most results are still in preliminary stage and integration into the SIAT has yet to be achieved. Coming project years will have to show how the sectorial land use analyses are integrated with landscape functional assessments into a comprehensive multifunctional assessment system that provides robust projections on sustainability impacts of policy driven land use scenarios for European regions. Updated information are regularly available at the projects website [www.sensor-ip.eu](http://www.sensor-ip.eu).

## Note

Paper prepared for the Workshop “*Implementing the CAP reform in the new Member States: impact on the sustainability of Farming Systems*” jointly organised by the Directorates-General Agriculture, Research and Technological Development and Joint Research Centre/Institute for Prospective Technological Studies, Seville, 6-7 October 2005.

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## **Part III:**

# **Countries' Context and Experiences**

# **From single farm payment and national top-ups to decoupling: the Slovak experience**

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## **1 CURRENT IMPLEMENTATION OF PILLAR I IN SLOVAKIA: SAPS AND NATIONAL TOP-UPS**

### ***Priorities of the Slovak agricultural and food policy***

In line with the objectives of the reformed Common Agricultural Policy (CAP), and considering the specific conditions of Slovakia, we define our priorities up to the year 2013 as follows:

- to ensure sustainable rural viability in the entirety of economic, residential, environmental and leisure functions of rural areas,
- to maintain and reinforce competitiveness of agricultural primary production and food industry on the domestic, EU and international markets by increasing efficiency of production and improving product quality,
- to ensure and maintain food safety and hygiene in the whole food chain, rise food quality, and enhance biodiversity and animal welfare,
- to promote environmentally friendly production systems in agriculture and maintain the environmental and landscape value of rural areas.

### ***Support measures and tools***

By acceding to the EU, the institutional framework of agricultural support totally changed and the level of payments increased. The management of support funds became exclusive responsibility of the Agricultural Payment Agency both for funds allocated by the Union and funds from the national budget. The Integrated Administrative and Control System (IACS) became functional during the year 2004, so direct payments could be disbursed close to the end of this year. The new time schedule for disbursement of payments (ex post payments) was in strong contrast with the previous national support practices, which provided farmers with advance payments during the year. This was a serious source of difficulties for farmers during the year 2005, when they experienced a severe lack of financial sources to cover operational expenses.

The total volume of support channelled into the agro-food sector (without SAPARD funds) increased by 11 % (on the yearly base). The structure of support changed, with a significant growth of direct payments' share (from 19.8 % in 2003 to 68.2 % in 2004), and has fallen in other categories of support (from 56.2 % in 2003 to 25.6 % in 2004).

Direct payments increased threefold compared to the year 2003. Against year 2003, the support of crop production significantly increased but not that of livestock.

**Table 1.1** Review of direct payments (in mil. EURO)

Commodity	2003	2004			Index
		Before the EU accession	After the EU accession	Total	2004/2003
Direct payment in crops	991.9	2 009.7	4 722.6	6 732.3	678.73
- of which: SAPS	-	-	3 061.3	3 061.3	-
- payment on other crops on arable land	991.9	2 009.7	1 661.3	3 671.0	370.10
Direct payment in livestock	1 310.2	245.1	-	245.1	18.71
<b>Total direct payments</b>	<b>2 302.1</b>	<b>2 254.8</b>	<b>4 722.6</b>	<b>6 977.4</b>	<b>303.09</b>

Source: Ministry of Agriculture (MoA SR), Agricultural Payment Agency.

Unlike direct payments, rural development support reached in the year 2004 only 60 % of the 2003 level. From funds envisaged for Rural Development Plan (RDP), only Less Favoured Area payments and SAPARD measures were drawn. Regarding to the project-oriented measures of RDP no money was paid off due to the project administration (submissions, approval etc.) which not finished in that year and none of approved projects could be completed.

### *Point of departure for direct payments*

The overall volume of direct payments (DP) is a sum generated by adding the EU allocation and the Slovak Complementary National DP (CNDP). In general, the Ministry of Finance is the body determining the total level of DP and pre-funding the payments. It is not easy to follow the flows of advance payments from the Ministry and of refunds from the EAGGF to the Ministry. That is why discovering which part is paid in the frame of SAPS, which part as CNDP and what is a real level of DP paid by Slovakia compared to the EU-15 is a complex task. The next table shows EU budgetary ceilings for Slovakia for annual financial envelopes for SAPS and partial or optional SFP during the period 2005 – 2013.

**Table 1.2** Direct payments (in million Euro)

Country	2005	2006	2007	2008	2009	2010	2011	2012	2013
Slovakia	97.70	115.4	146.6	183.2	219.7	256.2	292.8	329.3	365.9

Source: Regulation (EC) No. 1782/2003A: ANNEX VIIIa of REGULATION 1782/2003.

Similarly to the SAPS or SFP, EU details “Other direct payments” (ODP). ODP were listed in the budget 2005 and have the same timetable of yearly increments.

**Table 1.3** Amounts (in millions Euro)

	SLK
<b>A: ANNEX VIIIa of REGULATION 1782/2003</b>	97.700
<b>B: OTHER DIRECT PAYMENTS, TAKING ACCOUNT OF REGULATIONS 1782/2003 to 1788/2003 AS AMENDED</b>	
Protein area payments supplement (55,57 €/ha)	0.430
Compensatory payments to potato starch prod. (non DC)	0.0145
Tobacco premiums (non DC)	1.513
Dairy premium	4.958
Additional payments to milk producers	2.231
Nuts	0.112
Total: B	9.259
Total: A+B	106.959

Source: Modifying Annex VIII of Council Regulation (EC) No 1782/2003 and establishing budgetary ceilings for partial or optional implementation of the Single Payment Scheme and annual financial envelopes for Single Area Payment Scheme provided for in that Regulation ANNEX VI, Annual financial envelopes for the Single Area Payment Scheme, Calendar year 2005.

Based on the envelopes and as a result of calculations (see Table 1.4), two basic DP scenarios for Slovakia could be set up for the next period. Depending on the severity of budget constraints and the Ministry of Finance budget proposals, more than four scenarios (coupled or decoupled) are coming into the consideration in the period before SFP adoption (before the year 2009).

In Table 1.4 we present alternative volumes of CNDP based on the Ministry of Agriculture proposal (MoA request) and that of Ministry of Finance (MF plan) respectively. Total CNDP comprises, besides national sources, a transfer from the Rural Development Plan (R&D). This table shows, in the case of MF plan, a zero CNDP in the period of years 2007 and 2013. The level of total DP, in case of the MF plan will be significantly lower in years 2006-07, compared to the year 2005. This scenario (MF) will not allow coupled payments in years before the SFP adoption.

**Table 1.4** Financial envelopes and sources of direct payments

Items	Unit	2005	2006	2007	2008	2009	2010	2011	2012	2013
Level of the EU-15 direct payment	%	30.0	35.0	40.0	50.0	60.0	70.0	80.0	90.0	100.0
Volume of the EU-15 direct payment	mil. €	107.0	131.8	165.6	207.4	249.1	290.8	332.7	374.6	416.7
of which: SAPS, SFP	mil. €	97.7	115.4	146.6	183.2	219.7	256.2	292.8	329.3	365.9
other direct payment	mil. €	9.3	16.4	19.0	24.2	29.4	34.6	39.9	45.3	50.8
National sources: MoA request	mil. €	58.6	89.7	124.2	124.5	124.5	124.6	83.2	41.6	0.0
<b>National sources: MF plan</b>	<b>mil. €</b>	<b>58.6</b>	<b>2.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
Transfer from the R&D: MF plan	mil. €	34.4	23.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CNDP: MoA request	mil. €	93.1	113.0	124.2	124.5	124.5	124.6	83.2	41.6	0.0
CNDP: MF plan	mil. €	93.1	25.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real CNDP: MoA request (no R&D transfer)	mil. €	58.6	89.7	124.2	124.5	124.5	124.6	83.2	41.6	0.0
Real CNDP: MF plan (no R&D EU transfer)	mil. €	58.6	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total direct payment: MoA request	mil. €	200.0	244.8	289.9	331.9	373.6	415.4	415.9	416.2	416.7
Total direct payment: MF plan	mil. €	200.0	157.1	165.6	207.4	249.1	290.8	332.7	374.6	416.7

Source: Own calculations.

The next table No. 5 displays direct payments in Slovakia as shares of the EU-15 level. The 2006 budget proposal of MF is suggesting 6.7 % of the negotiated CNDP ceiling (i.e. 30 %). If we exclude the transfer from the R&D source, in 2006 the Slovak complement to DP will be close to zero (0.5 %).

**Table 1.5** Shares of direct payments on the EU-15 level

Items	Unit	2005	2006	2007	2008	2009	2010	2011	2012	2013
Level of the EU-15 direct payment	%	30.0	35.0	40.0	50.0	60.0	70.0	80.0	90.0	100.0
CNDP/EU-15 100% level: MoA request	%	26.1	30.0	30.0	30.0	30.0	30.0	20.0	10.0	0.0
<b>CNDP/EU-15 100% level: MF plan</b>	<b>%</b>	<b>26.1</b>	<b>6.7</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
Real CNDP/EU-15: MoA (no R&D transfer)	%	16.4	23.8	30.0	30.0	30.0	30.0	20.0	10.0	0.0
Real CNDP/EU-15: MF (no R&D transfer)	%	<b>16.4</b>	<b>0.5</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
DP in % EU-15: MoA request, (no R&D transfer)	%	46.4	58.8	70.0	80.0	90.0	100.0	100.0	100.0	100.0
DP in % EU-15: MF plan (no R&D transfer)	%	46.4	35.5	40.0	50.0	60.0	70.0	80.0	90.0	100.0
Total DP in % EU-15 MoA request	%	56.1	65.0	70.0	80.0	90.0	100.0	100.0	100.0	100.0
Total DP in % EU-15: MF plan	%	56.1	41.7	40.0	50.0	60.0	70.0	80.0	90.0	100.0

Source: Own calculations.

According to current expectations the deadline for Single Farm Payment's (SFP) adoption in Slovakia is 1<sup>st</sup> of January 2009. Until this date, SAPS and commodity-coupled payments will be applied. We suppose that the current top-up regimes implemented in 2004 will not change during the period 2005-2008. On the other hand, if the MF plan becomes reality, no coupled commodity supports would be applied (*scenario MF*). If CNDP is available in the years 2006-2008 (*scenario MoA*), direct payment schemes might consist from:

- SAPS;
- Coupled support for
  - o Crops on eligible area;
  - o Suckler cows;
  - o Ewes and goats;
  - o Tobacco and Hops.

### ***Impact of different scenarios for the period before the SFP adoption - simulation results***

The impacts of different scenarios of DP schemes presented in this paper are outcomes of simulations which used real data taken from several types of farms in Slovakia. The base of simulations is the structure of production and the economic results drawn from FADN 2003 database. There were singled out nine specific types of farms using criteria shown in Table 1.6.

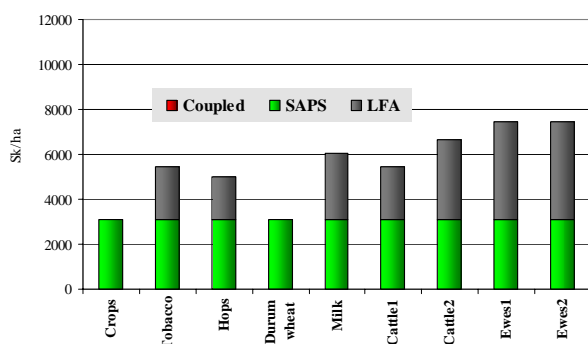
**Table 1.6** FADN typology based selection criteria for farms

	Production profile
<b>Tobacco</b>	farm oriented on tobacco production
<b>Hop</b>	farm oriented on hop production
<b>Durum wheat</b>	farm oriented on durum wheat
<b>Crops</b>	farm oriented on crops on eligible area for crops
<b>Milk</b>	farm oriented on milk production
<b>Cattle1</b>	farm oriented on cattle and beef production
<b>Cattle2</b>	farm oriented on cattle and suckler cows and permanent grass land and pastures represents > 80% of the total UAA
<b>Ewes1</b>	farm oriented on ewe production
<b>Ewes2</b>	farm oriented on ewe production and permanent grass land and pasture represents > 80% of the total UAA

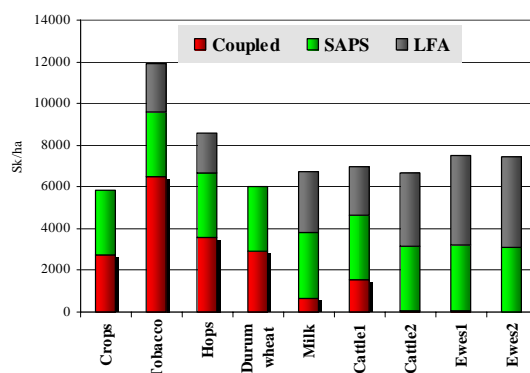
Model results under the different scenarios of DP confirm the assumption that coupled or decoupled payment schemes will affect not only agriculture as a whole, but they will have different impacts by regions and farm types.

- *Zero level of CNDP in years 2007-08 (scenario MF), will affect payments in all farms and does not allow partial coupling of payments. The volume of payments will depend only on the level of SAPS, the size of farm and the LFA classification of the farm. The unit SAPS rate will be same for all types of farms.*

**Graph 1** Payments - scenario MF 2007



**Graph 2** Payments - scenario MoA 2007



Note: LFA – payment to Less Favourite Areas from R&D Plan.

- *CNDP at the level of MoA request (scenario MoA) allows not only higher level of DP, but also partial coupled DP. This way, differentiated support targets would be possible, mainly focusing on farms with high share of arable crops, breeding of cattle and farms highly specialised (hops and tobacco).*

## **2 Direct payment and SAPS scheme change after SFP adoption in Slovakia**

Interested people in Slovakia assume in general, that after the year 2009 will be applied either:

**A.** The fully decoupled payment e.g. only Single Farm Payment will be applied (Regulation EC No 1782/2003, Title III);

or

**B.** A scenario, in which a decoupled direct payment will be paid while

- retaining as coupled up to 25 % of the component of national ceilings referred to in Article 41 corresponding to the arable crops (Article 65) paid in the non-regionalised form;
- retaining up to 100 % of the component of national ceilings corresponding to the suckler cow premium, retain up to 40 % of the component of national ceilings referred to in Article 41 corresponding to the slaughter premium for bovine animals other than for calves referred to in Annex VI (Article 68);
- retaining up to 50 % of the component of national ceilings referred to in Article 41 corresponding to the sheep and goat payments listed in Annex VI (Article 67).

Besides of the coupled schemes presented above, in Slovakia under consideration is to use:

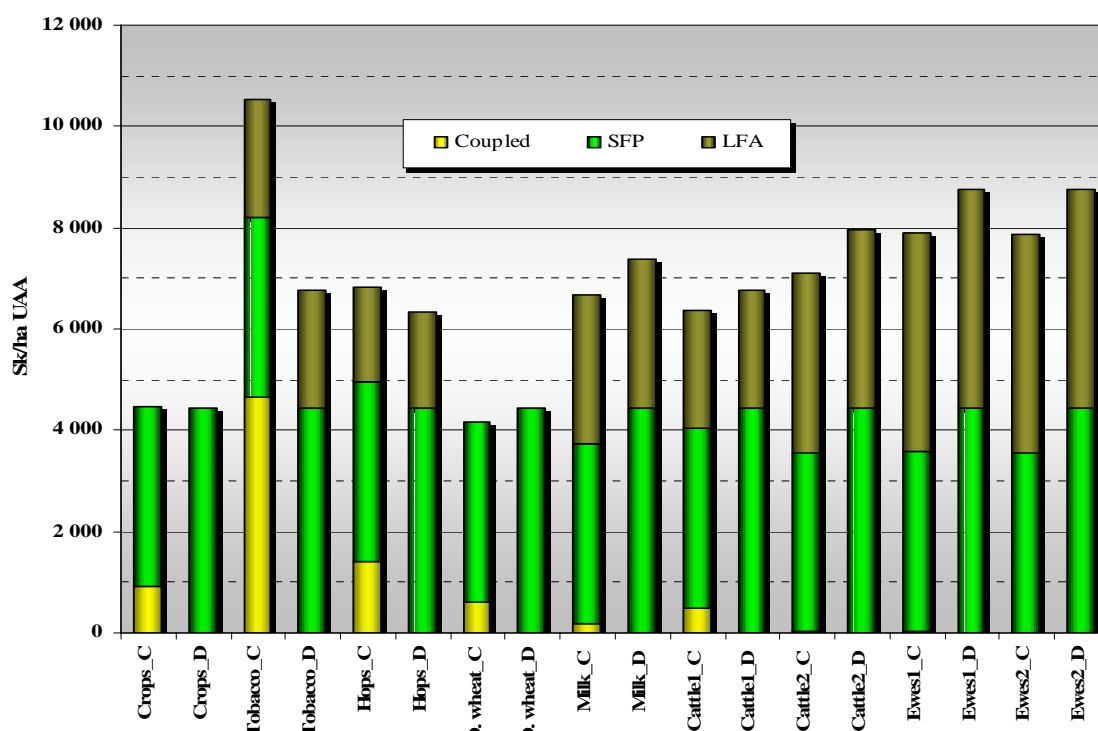
- Regulation (EE) No 2075/92, Article 3 on Tobacco (production aid),
- Regulation (EEC) No 1696/71, Article 12 on Hops (area aid),
- Regulation (EC) 1782/2003, Article 105 on the production of durum wheat in regions well established, other than those referred to in Annex X.

Until summer 2005, no decision on these two possible scenarios was made. At the end of this year a new assessment of implications on the farm level will be conducted. Based on the results and a wide discussion between main players (MoA, Agricultural Payment Agency, Agricultural Chamber and EC etc.) the Ministry of Land Management will decide about of SFP scheme implementation.

## **3 A BRIEF ASSESSMENT OF IMPLICATIONS OF ADOPTING SPS (SFP)**

The assessment of implications of adopting SFP has been done the same way as in the section 2.

**Graph 3** Coupled payment, SFP and LFA payment in the year 2009, scenario MF (level of CNDP is equal to zero)

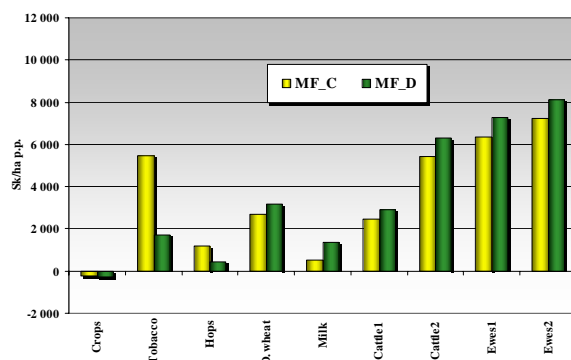


Note: farm\_C – partly coupled scenario MF, farm\_D – decoupled scenario MF.

- Partly coupled (scheme B) or decoupled payment (scheme A) will have probably an indifferent impact on the volume of DP for farms specialised on arable crops, but fully decoupled payments may adversely affect farms with a very high share of arable land on UAA;
- Decoupled payment will negatively affect specialised farms with high production shares of tobacco and hops;
- Partly coupled or decoupled payment will have probably indifferent impact on the volume of DP for farms oriented on durum wheat;
- Decoupled payment, compared to partly coupled, will be higher for dairy farms, mainly in hilly areas;
- Decoupled payment will be in favour of all types of cattle breeding farms (intensive, extensive), but much more in mountainous regions and with low share of arable land;
- Decoupled payment will be in favour of all types of ewe breeding farms (intensive, extensive), but much more in mountainous regions.

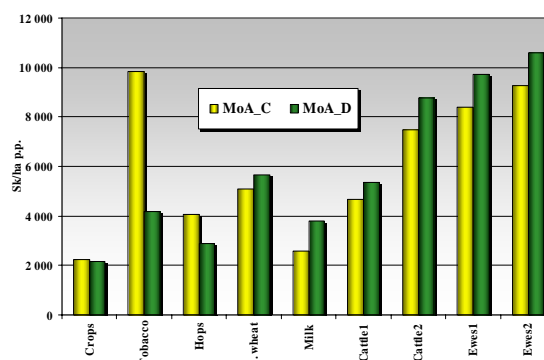
We consider total unit income as key indicator for assessing impacts of SFP implementation on the farm level. In this case, we express income per ha of UAA (Sk/ha). The income in our calculations consists of business result (revenue – costs), SFP, coupled payment and LFA support. It is important to include LFA support because it may reach in some scenarios the level of DP and may represent a significant source of income for some groups of farms.

**Graph 4** Income per ha UAA - scenario MF 2009



Notes: MF\_C – partly coupled scenario MF,  
MF\_D – decoupled scenario MF

**Graph 5** Income per ha UAA - scenario MoA 2009



Notes: MoA\_C – partly coupled scenario MoA,  
MoA\_D – decoupled scenario MoA

In general, assessing the impact of direct payment scheme on farm income we may suggest that decoupled payments will have in 2009 an income effect different from this generated in case of coupled payments. We assume that decoupled payments will:

- slightly reduce the income of arable crop farmers,
- significantly cut the income of tobacco growers,
- shrink the income of hops growers,
- moderately raise the income of durum wheat growers,
- significantly raise the income of dairy farms, but if zero national top-up apply it may lead in the scenario of partial decoupling (not calculating LFA payments) to losses,
- significantly raise the income of cattle farms,
- significantly boost the income of sheep farms.

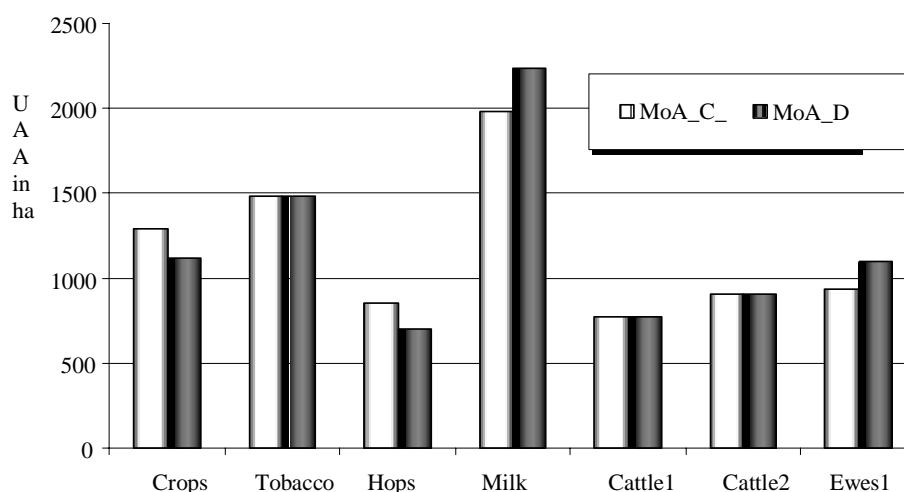
The scenario with zero level of NCDP (MF budget proposal) will bring probably a substantive deterioration of farm income. On longer term, loss-making farms may be forced to exit the sector. This is the case of zero NCDP applied already from 2007.

A zero NCDP may result in:

- losses of arable crop farms irrespective of the type of support scheme;
- substantial income reduction in tobacco farms and fall into loss in case of decoupled payment if there is no LFA payment;
- significant income loss in hops farms, if there is no LFA payment the minus income occurs at any type of support;
- fall of income in durum wheat farms; the income loss might be less if decoupled payments in place;
- substantial income loss of dairy farms (the income is lower by 2050 Sk/ha against the scenario using the MoA budget proposal when implementing coupled payments and by 2460 Sk/ha when applying decoupled scheme);
- Some income loss of cattle and sheep farms, the difference against MoA scenario is 2030 Sk/ha when applying coupled and 2470 Sk/ha in case of decoupled payments.

Some very preliminary results of the farm optimisation model indicate an opposite effects as expected. Decoupling, in model results, led to the higher land utilisation, mainly permanent grassland and pasture in case of dairy farms (in hilly areas), cattle and ewe breeding. On the other hand, decoupling decreased arable land utilisation. Preliminary result of those effects is presented in graph 6. Zero CNDP apparently will increase unused agricultural land.

**Graph 6** Utilisation of agricultural land by different types of farms - partly coupled and decoupled payment in the year of 2009 (adoption of SFP) – MoA scenario



Notes: MoA\_C – partly coupled scenario MoA, MoA\_D – decoupled scenario MoA.

#### 4 CONCLUSIONS - GENERALISATION FOR THE NEW MEMBER STATES

The results of the study "Impacts of decoupled and partly coupled direct payments on representative farms" point on different impacts of payments in different production and economic conditions of individual Slovakian regions. The future level of National Compensatory Direct Payments represents a significant uncertainty which will influence the decision on the type of support after the switch to the Single Farm Payment.

##### ► Partially decoupled direct support and farm payment

- Is beneficial for tobacco and hops farms,
- Is beneficial for farm with large eligible area of arable crops,
- Durum wheat farms have little benefits from the durum wheat support scheme,
- Is not beneficial for mountainous and sub-mountainous farms (dairy, beef, sheep) and for farms with small extent of market production of arable crops and high demand for other than fodder feedstuffs (energy feed based on self-grown cereals).

##### ► Decoupled direct payment (Single Farm Payment)

- Its implementation would not harm crops growing farms, durum wheat farms, neither dairy farms nor beef farms in lowlands. Nevertheless, their support payments were lower.
- Adversely hit tobacco and hops farms.

- Is explicitly beneficial for farms with large grassland area, limited eligible arable area and specialised on dairy, beef and sheep production in mountainous and sub-mountainous areas.

At the current state of our knowledge, under the Slovak circumstances, decoupled payment scheme may be assessed in its effects as more neutral than the partially decoupled one. Partially coupled payments might be considered as more close to fairness, but if national top-ups are equal zero, its effect, at least in the 2009 – 2010 period will not strongly deviate from the effect of fully decoupled payments. If there was a full-blooded CNDP, partially coupled payments might be effective in providing a support differentiated according to availability of production factors. We might suggest that this would contribute to a more efficient allocation of production and in the further period after 2013 there would be no need for coupling any more.

We would like to note that simulation results presented in this paper refer to Slovak agricultural situation and availability of resources and not necessarily may be generalised on all New Member Countries.

#### **Note**

Paper prepared for the Workshop *“Implementing the CAP reform in the new Member States: impact on the sustainability of Farming Systems”* jointly organised by the Directorates-General Agriculture, Research and Technological Development and Joint Research Centre/Institute for Prospective Technological Studies, Seville, 6-7 October 2005.

# National policies related to farming structures and sustainability in Bulgaria

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## 1. IMPLEMENTATION OF SAPS IN HUNGARY

The Hungarian Government decided in September 2003 the introduction of the Single Area Payment Scheme (SAPS) (Government Decree No 3089/2003). The Act of Accession set the criteria of how to determine the agricultural area under SAPS. It stipulated that the SAPS area in the new Member States should be the part of its utilised agricultural area, which has been maintained in good agricultural conditions at 30 June 2003. Furthermore, Article 1b(5) of Council Regulation No 1259/1999 authorises the new Member States to set a minimum size of eligible area at a higher level than 0.3 ha but not exceeding one ha.

The proposal submitted by the Ministry of Agriculture and Rural Development is summarised in Table 1. Obviously, it was not possible to forecast the exact area for which claims will be submitted because of the lack of suitable statistics and information. For the assessment of the area included in the SAPS we have used the data of the

- general agricultural census made by the Central Statistical Office,
- the register of agricultural producers,
- previous claims on area based national subsidies in 2003, and
- physical blocks under agricultural utilisation (data from the Hungarian Land Parcel identification System – LPIS (HU)).

The determination of the area under SAPS was complicated by the fact that SAPS aid might also be claimed for parcels located within residential areas (e.g. kitchen gardens) if they met the criteria. Since national area based subsidy could only be claimed for agricultural areas laying outside the settlement boundaries, the LPIS (HU) covers mainly those areas.

Areas less than one ha and land not kept in good agricultural conditions, areas which were regarded as not eligible, were established based on sampling and assessment.

Finally we have estimated that 4.3 million ha (74 %) out of the 5.8 million ha total agricultural area are eligible in the framework of the SAPS.

Taking into account the financial envelop of EUR 375,431,000 for the year 2005, established by the Commission services, an EU direct subsidy of EUR 86.22/ha has been granted for the Hungarian farmers under SAPS in 2005.

The Act of Accession established also the possibility for the new Member States to pay their farmers Complementary National Direct Payment (CNDP). However, according to the Act of Accession and related EU implementation regulations only those sectors may receive “top-up” payment from national budget, which are supported by the CAP in force, too. Based on this rule, Hungary has created 11 different “top-up” envelopes for the year 2005 (Table 2).

It has to be mentioned that there was a very strong demand from the part of social partners, NGO's, and breeding associations that direct payments in the animal sector should be paid as a headage payment instead of merging it into the flat rate area payment.

The calculation method of the envelopes was as follows:

- CNDP will be paid up to 60 % of the level of direct payments in force in 2005, so as basis 60 % of the total amount of support was taken. However, the dairy premium and the additional milk premium were considered at 90 % level. This amount was calculated for each envelope.
- This sum was reduced by the amount available for the sector under the single area payment scheme (except ewe and energy crops supplementary payments). As SAPS payment EUR 86.22/ha was used in the calculations.
- In the case of animal sectors the amount paid under SAPS was calculated as follows: the reference number of animals was converted first to livestock unit (LU) and this number was divided by an animal density value of 1.8 LU/ha. The resulted area was regarded as the area relating to the sector supported under SAPS.

## **2. CHALLENGES RELATED TO THE IMPLEMENTATION OF SAPS AND “TOP-UP” PAYMENTS**

Before the accession to the EU, there was a complex agricultural support system in Hungary. This system involved several measures that were similar to those applied in the EU (e.g. area based support to the farmers, investment support, and subsidies for LFA and for agricultural environment projects). At the same time, substantial differences existed among these measures, concerning the basic rules, procedures, timing and institutional requirements. The existing domestic measures and institutions both helped and hampered the proper preparation.

A new Land Parcel Identification System with physical blocks (i.e. areas with primarily natural boundaries) was created instead of existing very fragmented cadastre system. Although ortophotos of the physical blocks have already been prepared in 2000-2001, in the first year of implementation we had to experience that farmers were not sufficiently familiar with these maps. The consequences were:

- a high share (more than 20 % of the applications) had to be sent back to the farmer for further corrections;
- slow progress in controlling by the Paying Agency of the claims;
- payments could start mainly in February 2005, but the majority of payments were done in April 2005;
- the established conditions for good agricultural and environmental status should have been simplified, because many of the requirements was not measurable, and so they could not have been controlled;
- because of the late payments, farmers were unsatisfied and made a huge demonstration in March 2005 in Budapest and throughout the country. (They received the payment for the cereals offered for intervention with several months delay, too);
- although the decoupled area payment under SAPS decreased the administrative burden, this did not relate to the top-up payments in the different sectors

Finally the Hungarian Office for Agriculture and Rural Development received and processed 240 000 claims in 2004. The approved claims covered altogether 4,875,082 ha. It means that a reduction of 9.3 % of the area payment was necessary in 2004.

### **3. SHORT EVALUATION OF THE CONSEQUENCES OF IMPLEMENTING CAP ON FARMING STRUCTURE AND AGRICULTURAL INCOME**

However, the conditions (quotas, reference area, reference number for animals), laid down in the Accession Treaty related to agriculture, did not satisfy Hungarian farmers, today nobody debate any longer that these conditions would in any way limit the development of the Hungarian agriculture.

Our evaluation of the possible impacts of implementing SAPS and CAP in general on agricultural income and farming structure is based on the calculations of the Hungarian Research Institute for Agricultural Economics<sup>1</sup> and on the statistical data of the year 2004.

The main conclusions can be summarised as follows:

- an increase in the agricultural output volume will be about 4-5 % in the first years. The volume of crop products increases by 14-15 %, meanwhile the volume of animal products decrease by 5 %.
- The average net farm income (including direct payments) increases by about 18 % using as baseline the year 2002, reflecting the increase in direct payments farmers received.

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<sup>1</sup> IAE, 2004, *Possible short-term and mid-term impact if accession to the EU in the Hungarian agriculture*. Budapest.

- The income increase is much higher in the crop production, than in the animal sectors. Specifically, the increase is about 35 % in the cropping sector and about 3 % in the animal production.
- It should be noted that according to the forecast, from the year 2006 this trend of income increase might change, even a decline might have to be expected. It is that the gradually increasing direct support might be exceeded by the increasing cost of labour, land price, land tenancy, and other external services.
- A high increase occurred in the agro-food imports (27 %), in contrast to the moderate increase in exports (7 %). The balance of export-import remained still positive in 2004, but the income surplus of export further decreased. Imports grew both from old and new member states and from third countries.
- The impact of the CAP on farm structures started as early as the pre-accession period. Specifically, 4-5 % of the milk producer, 11-12 % of chicken farm and 23-25 % of pig farms gave up production in these years. According to the forecast of the Research Institute for Agricultural Economics, the structural changes will proceed in 2005 and 2006 driven by increasing input prices and low efficiency. A strong farm concentration may be expected first of all in the dairy, poultry, and pig sectors. It is expected that capital-strong larger farms will overtake the production and market share of farms non competitive.

#### 4. CONCLUSIONS

As a conclusion it can be said that the impact of the CAP on the different production sectors of Hungarian agriculture is varying. In general, an extensive type of development is to be observed, i.e. the less labour intensive cropping sectors will prevail (first of all cereal production), while the output of the animal sector (i.e. the production of more value added products) decreases. This type of development adversely affects not only the structure of the Hungarian export commodities, but also the rate of employment in rural areas.

The Hungarian state administration is now pondering how to pass over from SAPS to SFP scheme. This system should be tailored to serve our policy objectives.

It is not questionable that decoupling of direct payments has several favourable impacts on farm economy: reinforce the process of structural changes, improves farm competitiveness by giving more decision-power to the farmer, improves the transfer efficiency of support (farmer will be not ready to use more or less part of the subsidy to cover losses of the production) etc. On the other hand we think that an immediate general introduction of a flat rate area payment in Hungary would result in a not tolerable redistribution of existing farm incomes. Tobacco grower, dairy farms and sheep keeper without land would be above all adversely affected.

We think, when considering the impact of support system on national (regional) and EU agriculture more attention should be attached to the wider rural economy impacts. Although not easy to gauge, this issue seems to be especially relevant now, when EU is standing before the introduction of a new sugar regime.

## **Note**

Paper prepared for the Workshop “*Implementing the CAP reform in the new Member States: impact on the sustainability of Farming Systems*” jointly organised by the Directorates-General Agriculture, Research and Technological Development and Joint Research Centre/Institute for Prospective Technological Studies, Seville, 6-7 October 2005.

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# Distributional effects of policy reforms – The case of Slovenia

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## Abstract

*The paper attempts to estimate the income distributional effects of different alternatives of direct payments schemes under the latest reform of the EU Common Agricultural Policy (CAP) on agriculture in the case of Slovenia. The analysis is based on a static deterministic model for agricultural holdings. The scenario analyses include 58.776 agricultural holdings which applied for direct payments in 2002 and 2003. The distribution of direct payments according to different alternatives of CAP reform was compared against the distribution of standard scheme with 100 % EU level of payments. Introduction of a regional scheme with a defined single area payment would result in a drop in budgetary transfers to 13,684 farms (23.3 %) in comparison with the standard scheme. These farms receive a bulk of direct payments (46 %) under the current standard scheme. The estimated impact by sectors reveals that the negative distributive effects occur mainly in the beef and milk sectors. The impact analysis takes into account also various alternatives of combined direct payments as allowed by the CAP reform. Distributive effects of single area payments could be minimised with a combination of production coupled payments and specific compensatory payments. The system of a gradual introduction of single payments and simultaneous reduction of specific payments could also ease the negative distributive impact of CAP reform.*

**Key words:** CAP reform, redistributive effects, agricultural holdings, Slovenia

## 1 Introduction

The actual reform of the Common Agricultural Policy (CAP) from 2003 changed the goals and even more so the instruments of agricultural supports (European Commission, 2003/2004; Agra Focus, 2003/2005). The most significant change was the introduction of production decoupled payments in the form of a single farm payment (SFP). The financial envelope for SFP for "old" member states (EU-15) has been determined on the basis of the amounts of received funds in the reference period (2000-2002). The SFP can either be paid out on the basis of past rights per individual holding or single area payment should be introduced, which would be equal for all producers in a certain area. In legal terms, the latter is now known as "regionalisation" of the single payment, or regional implementation of the SFP. Furthermore, for the sake of solving the problems in selected sectors, SFP could be combined with production coupled payments according to the pre-reform direct payment scheme (Council Regulation 1782/03, 2003; Agra Focus, 2003/2005).

After the enlargement of the EU in 2004 the CAP reform will have to be introduced also in the new EU member states. The introduction of the SFP by the principles of historical references which apply in the old member states is not possible, as in the reference period (2000-2002) the new member states were not yet part of the European Union and therefore did not apply comparable policy measures. Thus, the Council of Ministers (Council Regulation 583/04, 2004) imposed on agreed with the new member states to introduce a regional version of the single payment. This means that in every region, which is determined in advance, a single level of area payment will be paid out, calculated on the basis of a national (regional) financial envelope. The envelope will depend on the reference quantities for individual forms of direct payments in effect before the CAP reform, which were negotiated upon in the accession negotiations. In the event

that individual agricultural holdings or groups of holdings face certain problems as a result of the reform, additional measures are foreseen to be taken in new member states. These additional measures, however, cannot be based on the "historic rights", to which only the EU-15 member states are entitled. Moreover, the system which was negotiated upon during the accession negotiations applies in the new member states, i.e. the possibility of progressive rising of direct payments from the EU budget from 25 % in 2004 to 100 % in 2013 as well as the possibility to top up the payments from the national budget. Slovenia thus has a right to complement the payments, having as a reference the achieved level of payments in 2003. In 2007 a 100 % level would be achieved compared to the EU-15 member states (Erjavec *et al.*, 2003). CAP reform comes into effect in 2005 for all member states, with a possibility to request a two-year delay at the most. The Government of the Republic of Slovenia informed European Commission that Slovenia would introduce the reform in 2007 (Ministry of Agriculture, Forestry and Food, 2004).

A decision regarding which scheme of direct payments to introduce is quite challenging for each of the EU member states. A scheme which is or will be chosen by national policy makers should be consistent with the prescribed CAP legal specifications, but also politically viable. In some CAP reform implementing countries it is also a matter of understanding the public objectives in relation with the agricultural policy. From 2002 onwards, Slovenia already distributes the payments according to the existing (standard) scheme of EU supports and is in this respect logical to hypothesize that introduction of a purely regional scheme would result in a considerable redistribution of budgetary transfers, which would in turn, significantly affect the economic attractiveness of individual sectors, and finally also the farm structure. Therefore, Slovenia could be a good case for studying the side-effects of the reform schemes.

Simple review of existing budgetary revenues for different type of production (expressed in value per ha of land used) in the continental part of EU shows that particularly high supports go to intensive beef and milk producers. The SFP is thus expected to affect a large number of producers and lead to a redistribution of budgetary funds. This is not negative per se, however it could influence the decision making process and have long-term effect on agricultural production and structures. Distributional effects were not under the primary objectives of the existing CAP reform, therefore, the analysis of effects of various alternatives of CAP reform is an important issue not so many times addressed by the agricultural economists. This mainly political issue could be of interest also for theoretical reasons, as it indicates a possibility of strong collateral effects of the reform, which are usually neglected not only by the decision makers but also in the economic theory.

This paper is thus an attempt to estimate the effects of the introduction of CAP reform on the distribution of direct payments on the case of Slovenia, using a static deterministic model of agricultural holdings. Its aim is in the first place to estimate the effects of the introduction of the regional scheme of CAP and further on to forecast – on the basis of various potential schemes of direct payment policies – the consequences and the options offered by the CAP reform.

## **2 Method of work and data**

### *2.1 The static deterministic model of agricultural holdings*

A static deterministic model of agricultural holdings was developed based on the IACS data of the Agency of the Agricultural Markets and Rural Development of Slovenia for 2002 and 2003 for each agricultural holding which applied for direct payments. The model includes physical indicators on areas, livestock, milk production, and received CAP-like direct payments in the reference year. The model allows simulation of various amounts and types of direct payments

and the formation of the categories of farms by the type of received payments, size (area and stocks) as well as classification as the less-favoured areas.

The comparative analysis included 58,776 agricultural holdings. For each agricultural holding included in the analysis, the value of direct payments by the types of payments under the existing CAP measures reaching the 100 % level of payments, and by various scenario schemes under the CAP reform was calculated. The total amount of direct payments by the regional scheme was estimated on the basis of the »national financial envelope« for Slovenia as calculated by the EU (Council Regulation 864/04, 2004) on the basis of quotas and reference quantities under the existing market organisations. It totals EUR 140.2 million.

## *2.2 Scenarios and results*

The analysis of scenarios was based on two reference scenarios. The first one – base scenario ("SS") represents the distribution of direct payments by the standard scheme, taking into account the 100 % level of payments. The second reference scenario represents an implementation of a net regional scheme ("R") in the form of a single payment per ha of arable land and grasslands. With the other scenarios, the additional possibilities for the implementation of CAP reform according to the Council Regulations 1782/03 (2003) and 583/04 (2004) were analysed. In the paper the results from four different combined scenarios are discussed:

*PC* - single area payment with production coupled payments (75 % of the level of payments for special premiums for bulls, 50 % of the level of payments for sheep).

*PCM* - single area payment with production coupled payments and historical payments of milk premium (75 % of the level of payments for special premiums for bulls, 50 % of the level of payments for sheep, 100 % of milk premium).

*HIS* - single area payment with additional specific payments for animal sectors (40 % of the pre-reform level).

*CRS* ("compensatory regional scheme") - single area payment with production-coupled payments and historical payments of milk premium (100 % slaughter premium for beef, 40 % of milk premium), additional compensatory payment per hectare for agricultural holdings in deteriorated economic position resulting from transition to the single payment scheme (40 % of losses established in the first year of reform).

The level of single payment for crops is the same in all the scenarios. The level of payment for grasslands is calculated as a residue of the national financial envelope and varies among scenarios.

For the CRS scenario the possibility of a gradual introduction of the reform was also foreseen. Thus, in the first year of the reform, the share of specific payments would be higher and, in turn, the single area payment for the grasslands would be lower. In the transitional period, the share of specific payments would then decrease until it has reached the level presented in the basic scenarios, while the single regional payment for grasslands would increase.

The results are presented by classes of redistribution effects and by production types. Seven classes of redistribution effects were formed. The classes -3 and +3 include agricultural holdings which lose or gain more than 50 % of the total value of direct payments compared to scenario "SS"; the classes -2 and +2 include the holdings with the change in total payments ranging from 30 to 50 %; the classes -1 and +1 the holdings with the change from 10 to 30 %; and the class zero the holdings where the payments changed by up to 10 %.

The production types were formed according to the proportion of the values of individual type (or group) of payments by standard scheme in the total value of direct payments in the holding. A holding is ranked into a certain type if the specific payment for this type of production represents more than 50 % of the total value of direct payments there. If none of the payments exceed 50 %, the holding is ranked in the group called »mixed« ("Mix"). In addition, there are the following types: arable crops ("Crop"); cattle fattening, where bull premiums represent most of supports ("Bulls"), and by analogy cattle-suckler cows ("Suck cows"), milk production ("Milk") and sheep breeding ("Sheep"). The results for the whole sample are presented with »SUM«.

### 3 Results and discussion

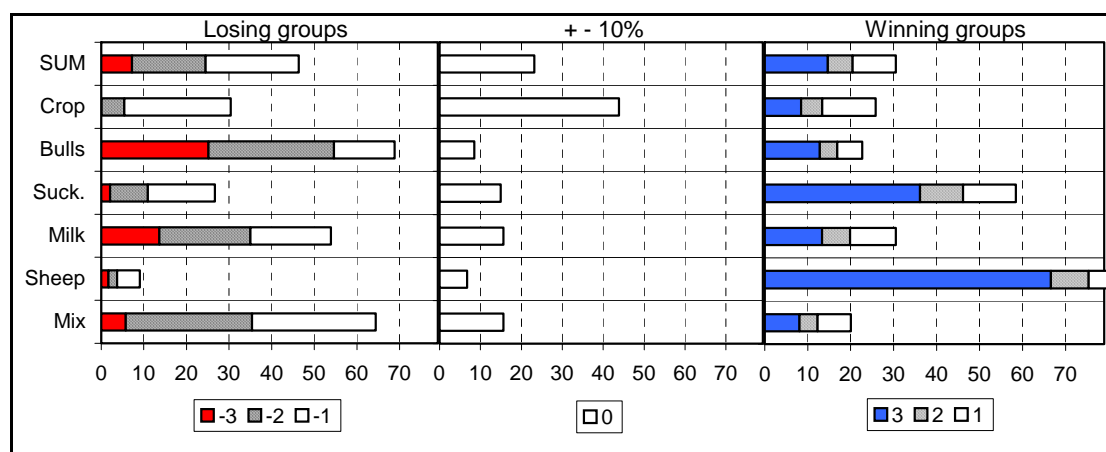
#### 3.1 Regional scheme

Net regional scheme, which is one of two legal extreme options of CAP reform and a compulsory basis for the implementation of the reform for the new member states, would have significant redistribution effects (Table 1). Compared to the standard scheme, the payments would go down in 13,684 agricultural holdings (23.3 %) in Slovenia. If expressed as the value of payments by the standard scheme, these "losing" holdings account for 46 % of payments. On average, the "losing" holdings would in the event of the net regional scheme realise 66 % of the payments of the standard scheme while 1,589 holdings (2.7 %) would lose more than 50 % of payments. On the other hand, this change would bring about a rise in payments for a significant part of the holdings. Also, to 20,291 holdings (34.5 %) would be allocated more than 50 % higher payments by the net regional scheme compared to the standard scheme. On the whole, more holdings would gain than lose by the regional scheme. Only in 22 % of holdings (23 % of payments), the change of scheme would not affect markedly the level of payments.

**Table 1** Redistribution effects in case of implementing the net regional scheme (R)

	Classes of redistribution effects*							Total	Lose	Gain
	-3	-2	-1	0	1	2	3			
Number of holdings (AH)	1589	4760	7335	13009	6961	4831	20291	58776	13684	32083
% of AH	2.7	8.1	12.5	22.1	11.8	8.2	34.5	100	23.3	54.6
% of payments under SS	7.2	17.3	21.8	23.1	10.1	5.7	14.7	100	46.3	30.5
Payments index (SS=100)	40	60	80	98	119	139	253	111	66	187

Note: \* Group of farm that in comparison to standard scheme: lose > 50 % of payments (-3); lose 30–50 % (-2); lose 10–30 % (-1); + - 10 % (0); gain 10–30 % (1); gain 30–50% (2) gain > 50 % (3)



**Graph 1** Redistribution of standard scheme payments in case of implementing the net regional scheme (R) by production orientations

The comparison by agricultural sectors shows that the redistribution effects would be the most negative in beef (“Bulls”) and milk production (Graph 1). As these sectors also represent an important share in the »mixed« type, also here the effects are extremely negative. As for the “Bulls” type, more than 40 % of the holdings (70 % of the payments) would be ranked in the losing groups, and these same holdings would get only around 50 % of payments according to the standard scheme. In the crop production, the changes would be relatively small. However, the sectors whose production is largely connected with grasslands would gain substantially since the stocking density in these sectors is lower (suckler cows, sheep and goats).

### 3.2 Combined solutions for alleviating redistribution effects

The comparison of schemes by different scenarios (Table 2) reveals the effects of the share of funds paid in the form of regional payment on the redistribution. The effects are the strongest in the net regional scheme, and they gradually ease with adding of various specific payments (other schemes).

**Table 2 Structure of National Envelope use and redistribution effects under various scenarios**

Items	Alternative Policy Scenarios				
	R	PC	PCM	HIS	CRS
<b>Structure of National Envelope (%)</b>					
Reserve (%)	3.0	3.0	3.0	3.0	3.0
Production-coupled payments (%)	0.0	11.1	11.1	0.0	9.3
Historic dairy rights (%)	0.0	0.0	14.6	0.0	5.9
Specific additional payments	0.0	0.0	0.0	19.9	5.1
Regional single payment (%)	97.0	85.9	71.3	77.1	76.7
<b>Redistribution effects by classes (% of payments under SS)</b>					
-3 lose >50 % in comparison to SS payments (%)	7.2	3.8	1.4	0.2	0.0
-2 lose 30-50 %	17.3	11.8	9.8	6.1	2.2
-1 lose 10-30 %	21.8	27.5	19.4	28.7	31.6
0 + - 10 %	23.1	28.6	33.3	33.0	39.0
1 gain 10-30 %	10.1	10.3	18.4	13.1	12.6
2 gain 30-50 %	5.7	5.6	8.0	6.5	5.7
3 gain >50 %	14.7	12.3	9.7	12.4	8.9
<b>Total lose groups</b>	<b>46.3</b>	<b>43.2</b>	<b>30.7</b>	<b>35.0</b>	<b>33.8</b>
<b>Total gain groups</b>	<b>30.5</b>	<b>28.2</b>	<b>36.1</b>	<b>32.1</b>	<b>27.3</b>
<b>Index of payments for losing groups (SS=100)</b>	<b>66.4</b>	<b>70.1</b>	<b>72.7</b>	<b>78.1</b>	<b>81.0</b>

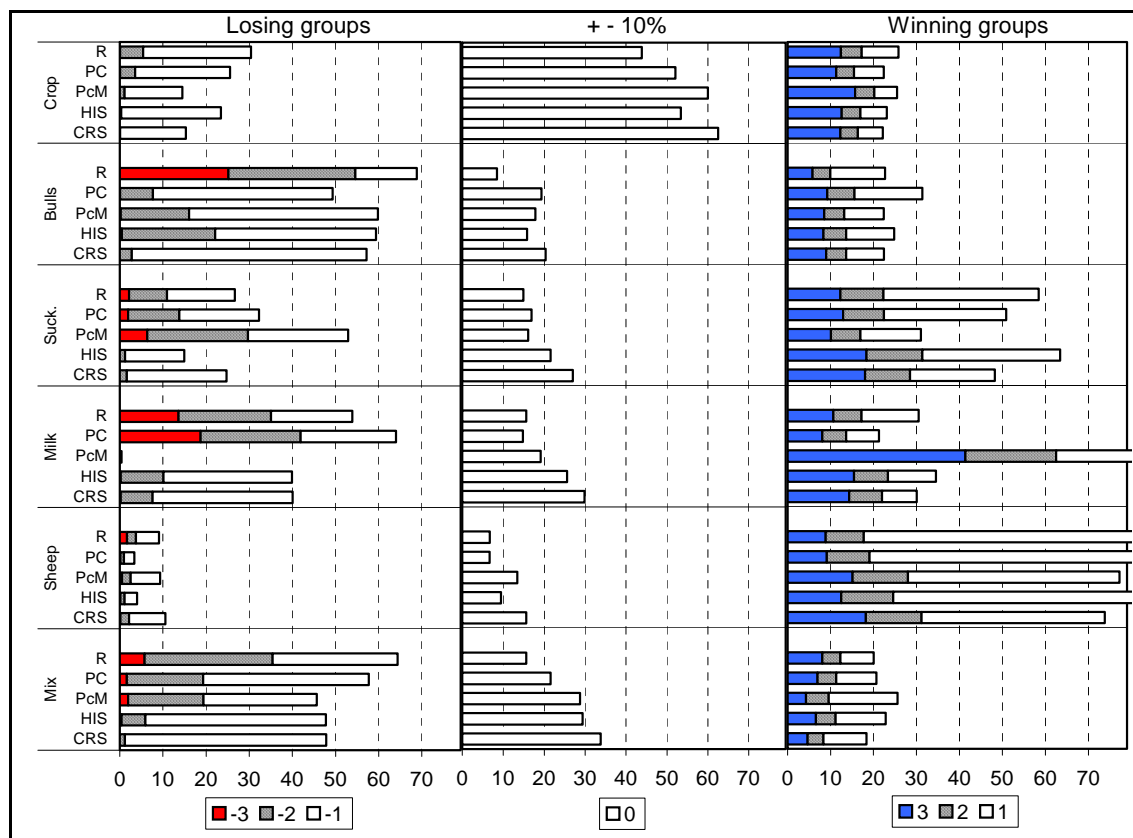
Note: R - Net regional scheme;

PC - Single Area Payment with production coupled payments;

PCM – Single Area Payment with production coupled payments and historical payments for milk premium;

HIS – Single Area Payment plus additional specific payments for animal sectors;

CRS – Compensatory Regional Scheme.



**Graph 2** Redistribution of standard scheme payments in case of implementing various combined schemes (scenarios) by production orientations

It is difficult to properly assess the consequences of individual scenarios only on the aggregate level, because the effects at the level of each production type are also important (Graph 2). In the schemes which preserve only some elements of the standard scheme (scenarios “PC” and “PCM”) it is evident, that the measure which alleviates the negative effects in one production type has the opposite effects in other types (scenario PC: improvement in "Bulls" type, deterioration in "Milk" type; scenario PCM: significant improvement in "Milk" type, deterioration in "Suckler cows." type). Although the reduction of payments seems the most problematic from the point of the policy, also those changes should be considered when dealing with redistribution effects, which cause disproportionately high increase in payments in one production type (“Milk” type in scenario PCM). Similar negative effects have been perceived also in other possible combinations of production coupled measures (slaughter premium, suckler cows and slaughter premium). We can conclude that only by the allowed production coupled measures and historic payments for milk it is not possible, if this is the objective of decision makers, to form a scheme which would not have significant redistribution effects at least in some production types.

The results of scenarios “HIS” and “CRS” show a more balanced picture and less intensive changes (decreasing of classes with the most significant changes: -3, 3). In scenario “HIS” single regional payments are combined with specific payments for the animal sectors, which are close to the historic payments rights. This scenario is shown here as an example of how suitable this approach could be for alleviating negative effects of the transition. This is further confirmed by the fact that most of the old Member States which have implemented the CAP reform in 2005 included historic payment rights in one way or another in their schemes (in the full form among

others Italy and Austria, or in combination with the regional scheme as in Denmark, Germany and Sweden; Agra Focus, 2003/2005).

Being a new EU Member State, Slovenia could have to look for different legal solutions for alleviating the negative distributional effects of the CAP reform. A number of combined schemes could be formed by combining the allowed production-coupled payments and different shares of historic payments for milk with additional payments for agricultural holdings in “specific sectors, finding themselves in a special situation as a result of the transition to the single payment scheme” (Council Regulation 583/04, 2004). The “Compensatory Regional Scheme” presented here is a relatively simple solution which also permits a gradual transition to the form here presented as scenario “CRS”.

#### **4. Conclusions**

Based on the results of the empirical case study carried out for Slovenia it can be generalised that the introduction of the regional payments under the CAP reform would result in a significant redistribution of funds for direct payments in comparison with the pre-reform scheme, detrimental for a significant part of agricultural holdings. The redistribution is an important politically sensitive side effect of the reform, which may significantly affect the economic attractiveness of individual production types and lead to different competitive positions of producers in different EU regions.

The effects of redistribution may be alleviated, if this is the objective of the policy makers, by various forms of specific compensatory payments. Given the possibility of a gradual adjustment to changes, the level of regional payments should be raised progressively and a higher level of specific payments should be assured upon the introduction of the reform.

The redistribution is primarily a political issue. The economists may contribute in the decision making process by the analysis of the different aspects of the reform effects. Defining which clear priorities of the agricultural policy are to be pursued when implementing the reform is of key importance when deciding on the final solution. This paper, however, opens only one dimension of the redistribution effects, because only the change from one type of policy support to another was examined. It would be interesting to examine also the horizontal inequities between individual production types of farms with or without various forms of policy support (Allanson, 2004). Moreover, the CAP reform has opened also the question of side effects, which could be a subject of further analyses: e.g. an analysis of the effects of the reform on land market, on production intensity and on protection of natural resources.

#### **Note**

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# National policies related to farming structures and sustainability in Bulgaria

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## ABSTRACT

*This paper presents the dominating farming structure in Bulgaria on the eve of the EU accession, evaluates recent policies for farm and agricultural income support, and assesses likely consequences of common agricultural policy (CAP) implementation on farming structures and sustainability.*

*We demonstrate that a specific farming structure dominates in the country consisting of numerous subsistence and small farms; and few large farms, cooperatives, and agro-firms; and widely used informal, vertically integrated, and mix forms. Public support to farming has been increasing in the recent years but is still far below the European level. Besides, only a fraction of farms benefit from some form of public support most of them being large farms, cooperatives, and tobacco producers. Farming is still an important income source for a good part of population. However, there is a significant gap in the monetary income in the large farms and some smaller-scale (intensive) enterprises, and the great majority of farms. Besides, development programs contribute less to agrarian and rural sustainability, and to decreasing the divergence between richer and poor regions of the country.*

*Assessment of the likely short-term impact of the CAP implementation in Bulgaria shows that it will increase sustainability of farms bringing net financial benefits, enhancing competitiveness, and improving environmental performance. However, the chief beneficiary of the direct payments and other support measures will be the biggest farms in the most developed regions of the country. CAP programs will also give new possibility for extending activities of existing forms and bring to a life new organisational arrangements. All that will create more employment and income opportunities, and revitalise agrarian and rural economy. On the other hand, some effective smaller-size and family structures and livestock farms will have no or limited access to EU funding. Consequently, income and performance gap between farms of different types, sub-sectors and regions will widened unless special supplementary measures ("coupled" with production and regions) are taken. Besides, CAP will likely support "ineffective" and non-market structures (such as part-time and subsistence farming, production cooperatives), and therefore raise their sustainability and delay further restructuring.*

*Last but not least important, there will be significant difficulties for introducing CAP and EU standards which will require more costs than in other countries, and will be associated with some time lag until "full" implementation, and would not involve less commercialised and subsistence farming.*

## INTRODUCTION

An unprecedented transformation has taken place in Bulgarian agriculture since 1990. Previous farming structure has been reorganised, markets liberalised, new type of public support introduced, and the institutional framework was modernised according to European standards. Negotiations for joining the EU have been successfully completed and the date for country's accession set for the year 2007. There has been a growing interest among local and international policy makers, farmers and economic agents, and the public at large, in the likely impact of implementation of the common agricultural policy (CAP) on farming structures and sustainability of Bulgarian agriculture.

This paper presents the dominating farming structure in Bulgaria on the eve of the EU accession, evaluates recent policies for farm and agricultural income support, and assesses the likely consequences of implementation of the CAP on farming structures and sustainability.

## OVERVIEW OF FARM STRUCTURES AND AGRICULTURAL INCOME

### *Current farming structure*

According to the last agricultural census there are 665,548 agricultural holdings in Bulgaria<sup>1</sup>. In addition, there are numerous unaccounted subsistence farms in the country.

Nearly all agricultural holdings utilise some farm land (Table 1). Land management is concentrated in a small number of large farms bigger than 100 ha. Around 3,900 of such enterprises (less than 0.6 % of farms) use 76 % of the Utilised Agricultural Area (UAA) covered by the census. At the same time more than a half million holdings (77 % of surveyed farms) are smaller than 1 ha and utilise under 7 % of the farmland.

**Table 1** Number, legal status, and utilised agricultural area of farms in Bulgaria

Holding type	Agricultural holdings		Agricultural area		Average UAA (ha)
	Number	Share	ha	Share	
<b>1. Holdings with UAA total</b>	<b>654,808</b>	<b>98.39</b>	<b>2,904,480</b>	<b>100</b>	<b>4.43</b>
Belonging to physical persons	648,274	97.40	879,678	30.29	1.36
Belonging to sole traders	2,870	0.43	340,861	11.74	118.77
Agricultural cooperatives	1,973	0.30	1,169,309	40.26	592.65
Farming companies	1,331	0.20	469,198	16.15	352.51
Partnerships etc.	360	0.05	45,434	1.56	1262.04
<b>2. Holdings without UAA</b>	<b>12000</b>	<b>1.80</b>	<b>0</b>	<b>0</b>	<b>0</b>
Total (1 plus 2)	665,548	100	2,904,480	100	4.43

Source: MAF, *Agricultural Holdings Census in Bulgaria* 2003.

Three types of farms dominate in Bulgarian agriculture since the beginning of transition – unregistered farms, agricultural cooperatives, and agri-firms. Different types of farms are with dissimilar size; and share in agrarian resources and output; and product specialisation and commercialisation; and level of efficiency.

The majority of agricultural holdings are not registered enterprises (“physical persons”) belonging to an individual, family, or informal partnership. Almost 98% of these farms are smaller than 5 ha having an average size of 0.65ha. The remaining fraction (16,750 farms) are bigger operators with an average size of 27.8 ha and accounting for 51% of the UAA of the physical entities. The unregistered farms manage less than a third of the UAA and carry out the best part of vegetables (83 %), tobacco (73 %), flowers (62 %), natural meadows (81 %), and vineyards (56 %) in the country. Besides, they produce a great variety of farm

<sup>1</sup> “Agricultural holding” is defined as an independent farming business meeting one of the following criteria: manages 0.5 ha of utilised agricultural land; or 0.3 ha of arable land; or 0.2 of natural grassland; or 0.1 ha of vegetables, berries, orchards, vineyards, nurseries, tobacco, hops, seeds and seedlings, flowers, essential oil crops and medicinal crops, mushrooms, etc.; or 0.05 ha crops under glass; or 1 cow; or 1 buffalo-cow; or 2 cattle; or 2 buffaloes; or 1 breeding sire; or 1 sow; or 5 pigs; or 5 ewes; or 2 she-goats; or 2 beasts of burden; or 50 laying hens; or 100 chicks for fattening; or 30 other poultry species; or 10 she-rabbits; or 10 bee families; or 1 000 quails or other species (MAF).

produce being an important way for food (self) supply of households. During the last several years the number of unregistered farms has decreased while their average size and share in the overall UAA increased.

Less than 1 % of the agricultural holdings are legal entities registered under the Trade Law or the Law for Cooperatives as Sole Traders, Limited Companies, Partnerships, and Agricultural Cooperatives (Table 1). The Production Cooperatives manage the greatest share of all UAA and they have the biggest operational size. They grow a half of cereals (wheat, barley) and oil crops (sunflower), and a major part of maize, orchards and vineyards of the country. Most cooperatives are essential service (and food) providers to subsistence and small farms, and their members. A number of these co-operatives diversify their activities into possessing and marketing, and apply “business like” governance - profit-making orientation, close-membership policy, joint-ventures with other organisations etc. At the same time, a significant part of co-operatives have been experiencing serious economic problems in recent years. Since 1998 the average size of cooperatives has shrank by one fifth and 40 % of them bankrupted or ceased to exist. Co-operated farmland has been “taken over” by other (primarily subsistence and small) farms or left unutilised, so that the share of co-operatives in overall UAA diminished.

The agro-firms are commonly large specialised enterprises comprising nearly 30 % of the total UAA. They are specialised mainly in grain production (wheat, sunflower) but there are also good examples in fruits, grapes, greenhouses, essential oil plants, mix (crop-livestock), and vertically integrated (farming-processing-marketing) activities. The number of agro-firms has doubled since the year 2000 and their share in UAA augmented. These farms increasingly incorporate new kind of activities and involve novel type of organisations (including ventures with non-agrarian and foreign capital). Newly established agro-firms have generally a smaller size and are into less land using productions. Consequently, there has been almost a two-fold reduction in the average UAA by that group of farm enterprises.

The livestock holdings account for a considerable part of all farms in Bulgaria (Table 2). More than a quarter of agricultural holdings have a milk cow, every third has goats and pigs, and more than 30 % breed sheep. Most livestock farms are “non-professional” small-scale breeders. Apart from household consumption many of these farms sell-out a fraction of the output to consumers or processors. The share of farms with more than 10 animals is insignificant (Figure 1). Only country’s pig, poultry, and to a certain extend buffalo productions are characterised by higher concentration and market-orientation.

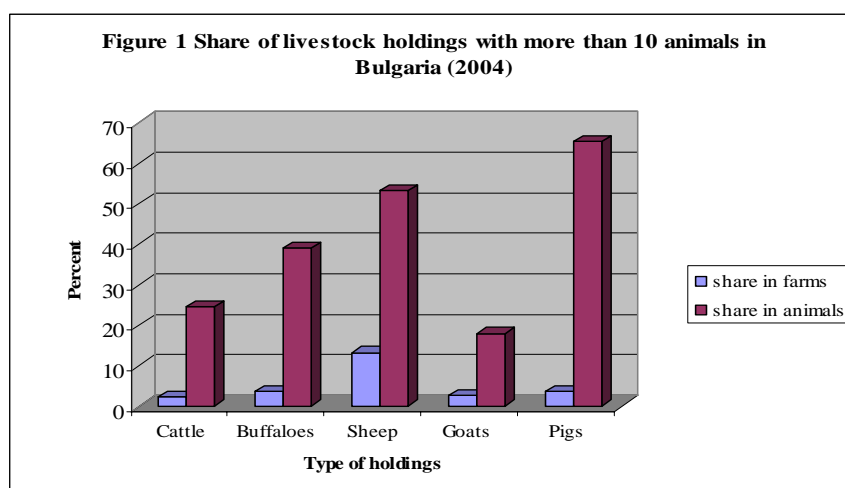
**Table 2** Number and size of livestock holdings in Bulgaria (November 1, 2004)

Type of holdings	Livestock holdings		Number of animals	Animals per farm
	Number	Share in all farms		
Cattle total	193,600	28.47	671,600	3.47
incl. milk cows	179,800	26.44	379,500	2.11
Water buffaloes - total	1,700	0.25	8,000	4.71
incl. buffalo cows	1,600	0.24	4,100	2.56
Sheep - total	209,100	30.75	1,692,500	8.09
incl. ewes	205,700	30.25	1,351,200	6.57
Goats - total	226,700	33.34	718,100	3.17
incl. female goats	222,100	32.66	578,500	2.60
Pigs - total	226,600	33.32	931,400	4.11
incl. sows	34,000	5.00	75,900	2.23

Source: MAF 2005.

Over 90 % of animals are bred in farms belonging to physical persons. Less than 2 % of agricultural holdings (almost all of them unregistered farms) have no UAA but breed animals. Those are entirely specialised livestock enterprises which account for 38 % of poultry, 28 % of pigs, 6 % of buffaloes, 3 % of cattle and sheep, and 2 % of goats in the country.

During the last several years there has been a reduction of the number of livestock holdings in all categories (with exception of pig breeders). That reduction has been coupled with an increase in overall livestock heads. Progressive changes in size of livestock farms have taken place particularly noticeable for water buffaloes, sheep, and cattle – increase by 38 %, 28 % and 20 % respectively.



Source: MAF 2005.

Hence, a specific and quite different structure from the EU and new member states emerged and is sustaining in Bulgarian farming. It consists of a huge number of subsistence and small farms, production cooperation in a large extend, and unprecedented concentration of land management and some livestock operations in few big farms. The biggest and most intensive farms are mainly located in the richest and favorable regions (North-East, North-Central, and non-mountainous parts of South-Central and South-Eastern) while smaller farms are dispersed throughout the country. The agrarian governance is also characterised by the

widespread use of personal and informal forms, vertically integrated and interlinked (e.g. inputs and/or credit supply against marketing) organisations, and mix modes with participation of non-agrarian and foreign capital (Bachev and Tsuji, 2001).

This farming structure puts some specific challenges for application of the CAP in Bulgaria. Firstly, administrative costs for the full implementation and control of policies to a large number of small farms will be much higher than in other countries. Consequently, compliance with the CAP standards will be uneven between farms and regions. Besides, there will likely be some formal size restrictions for participating in public support programs and thus limiting their impact to a certain share of farms. Next, that will require more complex organisation associated with the need to fine-tune policy instruments to the specific needs of various types of farms and agrarian organisations (contractual arrangements, informal modes, alliances etc.). Finally, the assessment of the impact of the “common” policy on farms of different type and size, with diverse goals and composition of share- and stake-holders, unlike structure of activity, and specific local (natural, economic etc.) environment would be much more complicated.

### ***Agricultural income***

Agriculture is a significant income source for a great part of population. There are 335 thousands full-time employees in the sector, which accounts for 11.5 % of the workers in the country (Table 3). In addition, almost one million Bulgarians are involved in farming on a part-time base and use it as a “supplementary” income source. The estimates in Annual Work Units (AWU)<sup>2</sup> show that agriculture comprises more than 26 % of the overall employment of the country. Labour contributed by part-time workers reaches 53 % of AWU of the sector. One-fifth of farming AWU is provided by individuals identifying themselves as unemployed.

**Table 3** Workforce in Bulgarian agriculture

Family workforce including the farmer			Non family workforce			Workforce	Labour input
Total	of which:		Permanently employed		Seasonal workers & outsourced services	Total	Total
	Full time	Part-time	Total	of which:			
				full-time	part-time		
'000 persons	'000 persons	'000 persons	'000 persons	'000 persons	'000 persons	'000 AWU	'000 AWU
1283	292	991	50	43	7	28	1333
							770

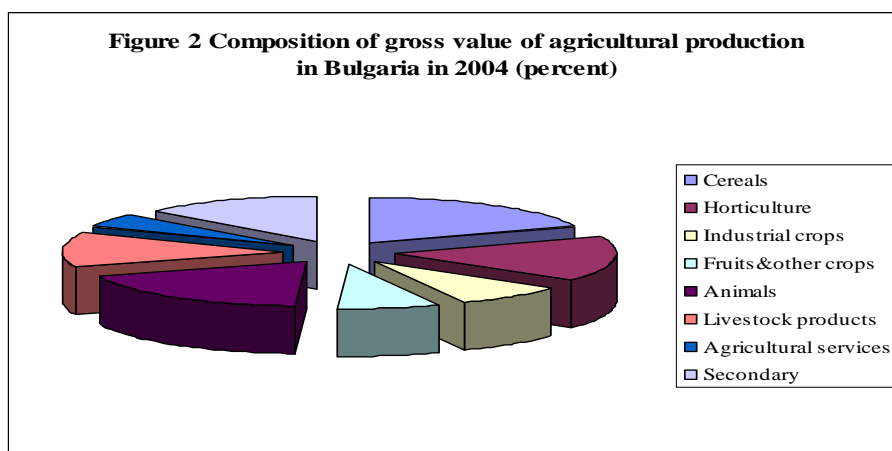
*Source: MAF, Agricultural Holdings Census in Bulgaria, 2003.*

The highest share of fully and partially employees in agriculture are in the unregistered farms. These enterprises rely predominately on family labour. The major employers are large farms, cooperatives, and agro-firms. However, hired labour is an insignificant part of the workforce in farming since 90 % of the overall AWU is supplied by family labour.

The Gross Value of Agricultural Production (GVAP) in 2004 amounts 3,436.9 million euros. The biggest contributors are cereals, horticulture, milk, industrial crops, pig, and poultry productions (Figure 2). A significant share of that value comprises income for compensation

<sup>2</sup> 1 AWU is equivalent to the hours worked by a single full-time worker within one year. For Bulgaria that is 1,856 hours or 232 man-days (MAF).

of family and hired labour, and for managerial entrepreneurship. For 2000-2004 the shares of the Net Value Added (NVA), the Net Operating Surplus (NOS), and the Entrepreneurial Income (EI) in GVAP are 44.3 %, 41.8 %, and 40.6 % respectively.



*Source: National Statistical Institute, 2005.*

The yields and quality variations, and changes in production structure and costs, and farm-gate price fluctuations, all they cause a great variation in the share of farm income, and its absolute and relative level in different years (Table 4).

The wages of hired labour in agriculture have been in increase but their level rests far below the national average. NVA per workforce, and NOS and EI per family worker are lower than the general wage level. The part-time and subsistence farming has been a major contributor to overall household income since the beginning of transition. Despite the fact that “household farm” weight has been progressively decreasing it still brings a good share in the overall income of Bulgarian households. In 2003 it reached 18.2 % of the total and 2.8 % of the monetary income of households. For rural households these levels are much higher comprising 37.9 % and 8.5 % respectively. In the less-developed regions farming is often the single income source of the population.

**Table 4** Indicators for agricultural income in Bulgaria (EURO; percent)\*

Indicators	2000	2001	2002	2003	2004
Share of Net Value Added in GVAP	44.85	45.78	41.76	43.87	45.38
Share of Net Operating Surplus in GVAP	40.91	43.30	38.52	42.57	44.04
Share of Entrepreneurial Income in GVAP	40.75	43.08	38.19	39.73	41.09
Average wage of hired labour in agriculture	1109.50	1138.65	1179.55	1239.37	1346.74
Share in average wage of whole economy	80.55	77.33	74.64	73.90	73.47
Net Value Added per workforce in agriculture	1066.91	1282.33	1139.00	1078.70	1169.95
Net Operating Surplus per family workforce	1078.73	1212.79	1050.85	1046.83	1135.38
Entrepreneurial Income per family workforce	1074.55	1206.77	1041.65	976.86	1059.50
Net Value Added per AWU	1968.42	2311.18	1971.79	1867.41	2025.38
Net Operating Surplus per family AWU	1995.06	2428.72	2021.34	2013.59	2183.92
Entrepreneurial Income per family AWU	1987.33	2416.66	2003.63	1879.02	2037.97
Net Value Added per holding	1973.54	2223.40	2232.77	2114.57	2293.44
Net Operating Surplus per holding	1800.23	2102.83	2060.00	2052.08	2225.68
Entrepreneurial Income per holding	1793.25	2092.39	2041.93	1914.94	2076.93

\* based on National Statistical Institute data.

On the other hand, the levels of NVA per AWU, and NOS and EI per family AWU have been higher than national average wage level. However, the dynamic of these indicators neither follows the evolution of costs of living nor the general growth of salaries in other industries.

The levels of NVA, NOS, EI per agricultural holding are also unstable in different years. Moreover, there is a significant dissimilarity in the income generation (and distribution) in different type of farms. As a rule, larger and highly specialised enterprises and some intensive smaller-size holdings (e.g. fruits, off season vegetables) reach substantial NOS and EI. On the other hand, small farms and some vegetable and milk producing holdings often hardly break-even. Finally, cooperatives tend to focus on GVAP and not-for-profit operations (services and benefits to members) and compensation for workers, most of them having little or no income for distribution as rent and dividends.

According to the 2003 census the average farm income is 1,920 Euro (Table 5). The greatest part of holdings has income level bellow 2,400 Euro. Most of these farms are small-size mix crop-livestock enterprises (17.8 % being specialized livestock operators) but they contribute to a third of standard gross margin of the sector. Middle income farms are insignificant part and a good amount among them (41 %) are mix farms. Nevertheless, almost one fifth of them are specialized in crop production and 17 % in livestock. Lastly, few of the biggest farms contribute a half of the standard gross margin of the sector.

**Table 5** Income groups, farms size, and contribution to standard gross margin in Bulgaria

Income groups (Euro)	Share of farms (%)	Average UAA (ha)	Share in country's standard gross margin (%)
Less than 2,400	92.4	0.69	34
2,400 – 19,200	7.0	6.23	16
More than 19,200	0.6	398.72	50

*Source: MAF, Agricultural Holdings Census in Bulgaria, 2003.*

Unlike in the EU and most of the new member states, agriculture is still a substantial income source for a good part of Bulgarian population. For a long time under economic hardships farming has been the only form for productive use of otherwise non-tradable household resources - restituted farmland and assets, “free” family labour etc. (Bachev and Kagatsume, 2002). Business (profit-oriented) organisations have developed but they coexist with a great less or non-commercialised sector – cooperatives, subsistence and mix farms, farming as a favorite leisure time occupation etc.

Distinct from most European countries the average agricultural income per AWU is higher than the wage level in the whole economy. However, there is a huge income disparity between farms of different types, sub-sectors, and regions. In general, the income level in most of Bulgarian farms is much lower than the relevant levels in the EU, new member countries, and neighbouring countries. All that will require a mix use of the CAP and other (social, development, regional etc.) policies to tackle the persisting socio-economic problems in rural areas (high unemployment, big disparity of income level, huge differences in living standards and social conditions etc.).

## **EVALUATION OF POLICIES FOR FARM STRUCTURES AND SUSTAINABILITY**

### ***Special Accession Program for Agricultural and Rural Development***

The Special Accession Program for Agricultural and Rural Development (SAPARD) has been a major support instrument for Bulgarian farming in the recent years. The broad goals for its implementation are set by the 2000-2006 National Plan for Agriculture and Rural Development (NARDP). NARDP aims at modernising, and improving efficiency and competitiveness of farms and food processing according to EU standards; sustainable development of rural regions in lines with leading ecological practices; creation of alternative employment in rural areas and new incentives for younger farmers; diversification of economic activities and building of modern rural infrastructure etc. Half of the investments for carrying out SAPARD projects come as subsidies, out of which 75 % are from the EU and the rest from the national budget.

Up to date ten measures for implementing SAPARD have been accredited, namely: Measure 1.1 "Investment in agricultural holdings"; Measure 1.2 "Improvement of processing and marketing of agricultural and fishery products"; Measure 2.1 "Developments and diversification of economic activities, creation of opportunities for multiple activities and alternative income"; Sub-measure 1.2.1 "Wholesale Markets"; Measure 1.4 "Forestry, afforestation of farmlands, investments in forest holdings, processing and marketing of forest products"; Measure 1.5 “Establishment of producers' organisations”; Measure 2.2 “Renovation and development of villages, preservation and conservancy of rural heritage and cultural traditions”; Measure 2.3 “Developments and improvement of rural infrastructure”; Measure 3.1 “Improvement of vocational training”; and Measure 4.1 “Technical assistance”.

Until the middle of 2005 as much as 1,910 projects have been approved with total investments of 768.8 million euro and 381.3 million euro of eligible subsidies. There has been a significant increase in the number and average size of projects since the launch of SAPARD. By the end of May 2005 more than 50 % of the projects were successfully completed and subsidies paid to beneficiaries. Almost all funded projects (except three small ones) cover Measure 1.1, 1.2, and 2.1 (Table 6). SAPARD investments and subsidies progressively take a good share in the Gross Value Added (GVA) of the sector.

The impact of SAPARD on Bulgarian farming is considerable considering the scope of the Program (for 2000-2006 the EU annual granted 52.124 million euro), and deficiency of agrarian credit and investment resources in the country.<sup>3</sup> Both publicised experiences and formal assessment show that successful projects have contributed a great deal to modernisation and efficiency of implementing farms.

**Table 6** Number and size of completed SAPARD projects in Bulgaria (euro)

Year	Indicators	Measure 1.1.	Measure 1.2.	Measure 2.1.	Total	Project size	Share in GVA
2001	projects	8	1	0	9	210455	
	investments	1605792	288303	0	1894096		0.11
2002	projects	81	12	4	97	279425	
	investments	17480898	9280607	342685	27104190		1.69
2003	projects	224	45	19	288	253826	
	investments	40246818	31343898	1511089	73101806		4.77
2004	projects	294	73	80	447	306160	
	investments	54073943	71205163	11574328	136853434		8.29
2005*	projects	102	30	31	164	380647	
	investments	18879414	37516293	6008238	62426163		n.a.
Total	projects	709	161	134	1004	300157	
2001-2005	investments	132286865	149634265	19436341	301357471		3.63**
	subsidies	66143431	74817132	9718170	150678733		1.82**

Source: MAF.

\* until end of May 2005; \*\* for 2001-2004.

Despite its original direction to support all prospective farms the majority of SAPARD projects have been granted to larger and highly commercialised enterprises. The bulk of funded projects under Measure 1.1. has been for high and rapid pay-off investments such as cereals (63 %) and machinery (83 %). Complicated bureaucratic procedures, massive paper work and formal requirements, and enormous efforts and costs for preparing, wining, and carrying out projects (for putting together proposals, related inspections, finding money-lenders, lobbying, bribes etc.), allowed only a small fraction of Bulgarian farms to have access to SAPARD funding. Up to date only 0.1 % of farms have got support to their investment by that program, most of them being firms and cooperatives located in more developed regions of the country.<sup>4</sup> In fact, SAPARD has been mainly accessible for the richest, most powerful, large-scale, and as a rule “less needy” farms and organisations.<sup>5</sup>

<sup>3</sup> Since 1998 the share of agrarian credit in portfolio of commercial banks is bellow or on 2 % level (BNB).

<sup>4</sup> Under Measure 1.1 the share of agro-firms and cooperatives in funded projects is 64 % and 23 % while 7.7 % of all agro-firms, 2.3 % of cooperatives, and only insignificant number of unregistered farms got funding from the program. Few projects are in less-developed regions: South-West, North-West, and mountainous parts of the country (Interim Assessment of SAPARD Program in Bulgaria, MAF, 2004).

<sup>5</sup> Assessment reveals that majority of beneficiaries under Measure 2.1. are non-agricultural companies (Interim Assessment of SAPARD Program in Bulgaria, MAF, 2004).

Besides, SAPARD resources have not been appropriate to support (and induce) huge capital investments necessary for modernisation of outdated or deficient farm assets and rural infrastructure in the country.

Projects selection criteria equally put some limits on the application of most of the farms – e.g. obligation to find out funding and complete the project before receiving any subsidy; requirement to match subsidy with 50 % own financing; prerequisites to have past farming history and certain amount of livestock (at least 15 milk cows, 100 milking sheep and/or water buffaloes, 30 pigs); compulsory non-income generation investments (e.g. in animal welfare, environment preservation etc.); requirement to present future marketing contracts for 50 % of processed outputs; age restrictions etc. Moreover, the uniform criteria for farms in all regions of the country and exclusion of some prospective areas of activity, put additional restrictions for application for funding of many farms.

Last but not least important, SAPARD has not practically addressed important aspects of farm and rural sustainability such as social and economic cohesion, environmental issues, water management, animal welfare, preservation of biodiversity etc. Therefore, a substantial improvement in management and organisation of SAPARD (and future agrarian and rural development programs) is to be undertaken which is to: introduce new measures associated with farm and rural sustainability; and reduce disparity between farms, sub-sectors and regions; enhance transparency and efficiency of project selection and control; increase accessibility for prospective small and middle-size farms; decrease direct and hidden costs for participants etc.

### ***State Fund Agriculture***

Until recently the State Fund Agriculture (SFA) has been the major instrument for providing government support to farming structures. SFA provides targeted credits and subsidies for all type of farms producing for the market. Its short-term finance lines include targeted credits and subsidies for major productions and activities. Since the beginning of transition the Government intervention in short-term finance supply has been a critical factor for carrying out the most important production operations of larger commercial farms. In recent years there has been a significant shift in the policy associated with a considerable increase in targeted subsidies and a sharp reduction of short-term crediting (Table 7). Although the overall level of intervention (short term credit plus targeted subsidies) is almost unaffected, the change in structure of support (namely the form of direct subsidies) is appreciated by producers. Overall that type of aid reaches minor number of producers and its share in GVAP is low.

**Table 7 Support to Bulgarian farms from State Fund of Agriculture (euro, percent)**

Indicators	2000	2001	2002	2003	2004	2004/2000
<i>1. Investment credit</i>						
Number of projects	614	229	135	897	298	48.53
Total amount (€)	19856531	17519928	6429123	23135446	4755014	23.95
Project average size (€)	32340	76506	47623	25792	15956	49.34
Share in GVA (%)	0.59	0.47	0.18	0.71	0.14	
<i>2. Short-term credit</i>						
Number of contracts	3635	3258	3381	n.a.	n.a.	
Total amount (€)	15267687	13198233	12521028	6378366	1732768	11.35
Share in GVAP (%)	0.94	0.73	0.78	0.42	0.10	
<i>3. Targeted subsidies</i>						
Number of contracts	6506	6265	8141	16415	16191	248.86
Total amount (€)	5405378	9688316	12585050	22134848	18406508	340.52
Share in GVAP (%)	0.33	0.54	0.79	1.44	1.11	
<i>Total amount (2+3)</i>	20673065	22886549	25106078	28513214	20139276	97.42

Source: MAF.

SFA also provides credit and subsidies for long-term investments of market-oriented farms through three specific programs (“Crop production”, “Livestock husbandry”, and “Agricultural machinery”) and two sub-programs (“Alternative Agriculture in the Rhodopi Mountain”, and “Agriculture Development in Northwestern Bulgaria”). Different types of schemes have been used giving opportunity to match to the specific situation and needs of applicant farms (resource endowment, stage of development, project size, priority areas) and employing different modes of funding (“with money and at the risk of SFA”, “with money of SFA and at the risk of commercial banks”, subsidising interest rate and/or investments, providing explicit guarantee from SFA).

In recent years investment credit has been targeted to small and medium-size producers and to less developed regions in order to improve farmers access to direct subsidy schemes and capacity to apply for SAPARD. Indeed a major portion of funded projects has been proposals coming from unregistered farms<sup>6</sup> and the average size of projects has been getting smaller (Table 7). Besides, almost a half of the investments have gone to projects in two less developed regions of the country (MAF, 2004). Nevertheless, the relative share of farms supported by SFA and its part in GVA is not considerable. Moreover, complicated procedures, high costs for participating farms, impossibility for application by informal partnerships, and widespread mismanagement and corruption have prevented the relatively smaller (and most needy) farms to get access to SFA programs. Last but not least important, after the 2003 “peack” both the number of funded projects and the amount of provided credits have been substantially cut down.

### ***Support to tobacco producers***

A special state program provides support to tobacco producers in the country. To all registered tobacco farms are allocated quotas for production, receive tobacco seeds free of charge, have minimum farm-gate prices (differentiated according to type, origin and class of

<sup>6</sup> In different years the share of unregistered farms, agro-firms and cooperatives in SFA funded investment projects has been between 68-87%, 12-26%, and 4-6% accordingly (MAF).

tobacco) guaranteed by the Government, receive premium for marketed tobacco, and obtain targeted premium for high quality produce.

There has been some increase in purchase prices of major type of tobacco in recent years (Table 8). However, the policy has been to slow down the price growth in order to enhance the competitiveness of exported products. Compensation of producers for the rise in inputs costs is made by augmenting the level of the premium. Besides, the targeted premium is progressively extended to stimulate production of high quality tobacco.

**Table 8 Public support to tobacco producers in Bulgaria (euro, %)**

Indicators	2000	2001	2002	2003	2003/2000
Buy in price Oriental type (€)	1.62	1.72	1.60	2.00	124.05
Buy in price Virginia type (€)	1.29	1.41	1.22	1.37	106.35
Buy in price Burley type (€)	0.94	0.99	0.97	0.99	104.89
Premium per kg (€)	1.05	0.70	0.96	1.00	95.87
Registered tobacco producers (%)	46579	47784	60076	62789	134.80
Share of supported producers (%)	91.52	89.21	85.79	67.71	
Subsidies to producers (€)	33447692	40667134	59552211	61667936	184.37
Subsidy per producer (€)	954	1397	1155	1450	152.04
Share of subsidies in output* (%)	41.69	40.49	43.86	45.70	

Source: MAF

\* GVAP plus premiums

Since 2000 the number of registered tobacco producers has been increasing. A good share of tobacco farms has received direct subsidies in kind of premiums. There has been a sizable raise in the overall amount of subsidies paid to producers. Subsequently, the public intervention added more than 50 % to the monetary income of beneficiary farms. The initial great share of subsidies in the sectors' output has even slightly increased in recent years.

The majority of tobacco producers are small-scale family farms located in areas with low opportunities for alternative farm and off-farm income. Therefore, that program contributes significantly to increasing incentives for production of high quality tobacco and sustaining farming in some of the less-developed regions of the country.

### ***Other instruments***

In the recent years there has been further harmonisation of the national support policy with the EU legislation. For example, the Law for Intervention in Markets of Agricultural Products, based on EU regime for interventions in the sector "Field cultures" and market for slaughterhouse produce, has been adapted. However, actual Government actions have been entirely focused on protecting consumers though reducing and stabilising prices (e.g. along "wheat - flour – bread chain")<sup>7</sup> rather than increasing farmers' income.

The legislation for granting export subsidies for processed and unprocessed agricultural products has been also introduced. Consequently, for the first time in 2004 export subsidies of 1.5 million euro were paid for cheese from sheep and cow milk, lamb meat, caned fruits and vegetables, eggs for consumption, and domestic rosters and hens. That affected

<sup>7</sup> E.g. increasing fees for quality control of exported cereals, temporary ban on wheat and flour exports, trading wheat from State Reserve, duty free flour import, all they have been applied in recent years.

positively the demand for the respective products and eventually influenced (stabilised) the income of producers.

In addition, there have been a number of initiatives of the Ministry of Labour and Social Policy supporting individuals and farms, including “Employment through Support of Business”; “Micro-credit Guarantee Fund”; “Preservation of Yield 2005”; “Increasing Employment and Qualification in Apiculture”; “Agricultural Producers”; “From Social Payments to Employment”; “Overcoming Poverty”. These programs have given some assistance to participating few individuals and farms in granting access to preferential credit, starting up or extending farming activities, obtaining grants and other payments etc. Nevertheless, due to small scope of the projects (less-developed regions, jobless individuals, subsistence farms), insufficient and unsustainable support (short-term, limited funds), unachievable requirements (e.g. necessity to have own farmland and assets, mandatory insurance on the expense of participants) their overall impact on farming structures has been insignificant.

### ***Regional dimensions***

Estimates demonstrate that until recently the Aggregate Level of Support to Agriculture in Bulgaria was very low, close to zero or even negative (Review of Agricultural Policies: Bulgaria, 2000). There has been considerable progress in the public aid to agrarian sector since 2000. However, overall support to farms rests very little, and much below the level in EU and other countries in the region. Only a small proportion of the farms benefits from some form of public assistance (price guarantee, preferential credit, or various sort of targeted subsidies and grants). The majority of Bulgarian farms are either unsupported or obtain insignificant public back up. Hence they are exposed to direct market pressure and compete successfully with heavily subsidised foreign rivals, on domestic and international markets alike. Furthermore, there are strong incentives to get “additional” CAP support by all farms as far as costs of acquisition (registration, paper work, compliance with restrictions) are smaller than anticipated net benefits.

What is more, the general institutions and infrastructure essential for the effective farming and rural development have not been built in the country: the public system for enforcement of laws, regulations, and contracts does not work well; often public support programs are not governed effectively and in the best interest of legitimate beneficiaries, and they bring about bigger disproportion between farms of different types, sub-sectors and regions; newly established system for agrarian extension does not serve majority of farms and include rural development issues; the privatisation of the irrigation system has not been completed; urgently needed system for agrarian insurance has not been introduced; crucial agrarian and rural infrastructure (wholesale markets, irrigation, roads etc.) has not been modernised; public support for initiating and developing farming associations has not been given; multifunctional role of agriculture has not been recognised and specific standards for environmental protection, animal welfare etc. were not set up.

All that has delayed the modernisation of Bulgarian farms comparing to the EU (quality, environmental etc.) standards and progress made in other transitional countries. For instance, renovation of outdated machinery, orchards, vineyards etc. has been very slow; fertiliser compensation of extracted nitrogen, phosphates and potassium has been extremely low<sup>8</sup>;

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<sup>8</sup> 85 %, 11.5 % and 1.8 % respectively (2004 Agrarian report, MAF).

large-scale operators practice monoculture and do not comply with biodiversity norms; significant farmland is not properly maintained or is abandoned; most livestock farms hardly meet EU standards; structural, sectoral and regional differences have been broadened etc. All that will have serious negative implications for the long-term sustainability of considerable number of farms in the years to come (Bachev, 2005).

## **IMPACT OF THE CAP IMPLEMENTATION ON THE SUSTAINABILITY OF FARMS**

### ***Assessment problems***

The assessment of the impact of any complex policy is difficult and requires appropriate approach, indicators and data. The task is even harder when a preliminary evaluation is to be made on likely (future) consequences of implementation of a new policy in entirely new socio-economic, institutional etc. environment. Evaluating the possible impact of the CAP on the sustainability of farming structure is even more complicated. First of all, CAP aims achieving various and sometimes controversial objectives - support farms, protect consumers, preserve environment, respect animal welfare etc. According to the specific local priorities these different aspects of the CAP will have dissimilar “weights”, and therefore implemented, enforced, and supported (toped up) unequally among countries<sup>9</sup>. Consequently, a farm will have quite a different level of sustainability depending on the specific institutional environment, and direct comparisons of farm indicators between countries or individual regions within a country will not be precise all the time.

Second, the efficiency of carrying out a “common” policy is quite unlike in various countries because of the different administrative capacity and ability to carry out reforms (diverse readiness, experience, and corruption of bureaucracy); dissimilar level of participation and compliance (awareness, acceptance, practical involvement, voluntary initiatives) by farmers etc. Hence the feasible (most realistic) rather than over-optimistic scenario for the pace of the implementation of policy instruments is to be always taken into account.

Third, CAP is usually applied along with other (national, sectoral, regional etc.) policies with supplementing or multiplying impact. Furthermore, changes in farms sustainability often depends on other factors such as the overall growth of economy, development of markets and competition, efficiency of private and collective actions, evolution of informal institutions etc. All that makes it extremely difficult to separate the proper effect of a particular policy on farms.

Forth, agrarian sustainability is among the most discussed issues by policy-makers, scientists, interest groups, and the public at large. Nevertheless, there is no universal agreement on its content, criteria and indicators for assessment (Hansen, 1996). Moreover, farm sustainability has numerous economic, social, institutional, environmental, inter- and intra-generational etc. dimensions. Thus it can not be correctly understood without analysing larger economic, social, ecological etc. structures.<sup>10</sup> Besides, overall sustainability of farm is not a simple

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<sup>9</sup> Socially acceptable norms for usage of labour, plant and livestock, land and other environmental resources, all they could differ even between various regions of the same country. In EU countries there exist a big variation in levels and extend of enforcement of agri-environmental standards.

<sup>10</sup> For instance, the high sustainability of part-time and subsistent farming could be hardly explained without considering superior household and rural economies; environmental aspects of farm sustainability are usually displayed at a larger eco-system, regional etc. scale, and so forth.

“sum up” of sustainability levels of different components but often depends on (critical) element with the lowest sustainability level. What is more, various farms have quite different goals (profit making, income generation, non-for-profit activities, servicing members, self-sufficiency etc.). Therefore, their sustainability could not be properly measured with few simple (universal) indicators such as productivity, income, dependency from subsidies etc.<sup>11</sup>

Fifth, the impact of the CAP manifest over a longer period of time. What is more, the CAP also changes along with the evolution of (global, European, local) institutional environment and farm structures. Therefore, the assessment of farm sustainability is not a one-time affair but rather a current process, and any estimates based on a short-time frame and static (historic) data will not be accurate. Besides, it is to be considered different scenario for CAP modernisation and the levels of farms adaptation to evolving market, institutional, natural etc. environment.<sup>12</sup>

Finally, there is no system providing appropriate and reliable farm level data in Bulgaria which makes any analysis of farms sustainability extremely challenging matter.

### ***Likely consequences of CAP implementation on farm structure and income***

The accession of the country to the EU and implementation of the CAP will give new opportunities to Bulgarian farms. Only the EU funding which agriculture will receive from 2007 on will be 5.1 times higher than the overall level of present support to farming. More specifically, short-term CAP impact on the farm structure is to be expected in the following directions. First, it will introduce and enforce a “new order” (regulations, quality and safety standards, protection against market instability, export support etc.)<sup>13</sup> that will eventually intensify agrarian transactions and increase their efficiency. Further integration and opening up of markets will enhance competition and let Bulgarian farms explore fully their comparative advantages (low costs, high quality, specific character of produces; innovation potential etc.). That will lead to the expansion of export and presence at growing internal market.

Second, a significant part of farms will start receiving direct payments<sup>14</sup>. During 2007-2009 all farms will get a single payments according to amount of utilised agricultural land<sup>15</sup>. Depending on the Government decision for the minimum size of UAA for supporting a farm<sup>16</sup> the amount of direct payments will be somewhere between 69-74.2 Euro per ha in 2007, 82.8-89.1 Euro per ha in 2008, and 96.8-104.1 Euro per ha in 2009. Besides, farms

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<sup>11</sup> Critical analysis of major approaches for assessing farm sustainability is presented by Bachev and Petters (2005) and a new approach based on the New Institutional Economics framework suggested.

<sup>12</sup> Our suggestion to use *adaptability* as a criteria and indicator for sustainability has been already incorporated in the holistic System for assessing sustainability of agriculture systems in Belgium – SAFE (Sauvenier *et al.*, 2005).

<sup>13</sup> EU funds allocated for market support for 2007-2009 accounts for 388 million euro (MAF).

<sup>14</sup> From EU for direct payments there will be available 200.3 millions, 240.4 millions, and 281 millions for 2007, 2008 and 2009 accordingly, which corresponds to 25%, 30%, and 35% of the EU-15 level of direct payments for relevant year. Phasing will continue until complete balancing in 2016.

<sup>15</sup> There is a possibility for extension of Single Area Payment Scheme until 2011 (MAF).

<sup>16</sup> The proposal of the Council of European Integration is: 1 ha utilised agricultural land, or 0.5 ha vineyards, or 0.5 ha orchards, or 0.5 ha vegetables, or 0.5 ha tobacco (The European Commission has objections as far as the minimum size for vegetables and tobacco is concerned). The minimum size of farm plot which could receive payment according to Single Area Payment Scheme is set to 0.1 ha.

may get additional payments from the national budget<sup>17</sup>. Consequently, from 153,640 to 665,548 and more farms will be eligible for direct payments.

Considering the current state of support (low or none) the direct payments will augment the level of farm sustainability through increasing general (net) income or preventing its possible reduction. Moreover, direct payments will improve the environmental performance of farms since they will be coupled with mandatory requirements for “keeping the farmland in good agricultural and environmental condition”. Direct payments could even induce usage of some less-productive and presently abandoned lands, and provide new income in certain less-favorable and mountainous regions of the country.

However, such public support will benefit unevenly different type of farms as a little more than 3 % of farms (large farms, cooperatives, and agri-firms) will touch more than 85 % of the subsidies. Many effective small-scale operations (horticulture, green-house etc.) will receive no or only a tiny fraction of the direct payments. The problem will be extremely perceived by tobacco producers who currently enjoy a high level of support. Besides, specialised livestock farms will not be eligible to receive any payments under that scheme. Above and beyond, the bulk of subsidies will go to the more developed regions where the biggest farms and UAA are located. All these will foster disparity in income and efficiency among different farms, sub-sectors and regions, and would require some sort of (coupled with production and region) aid to maintain the income level or to compensate certain producers.

On the other hand, this method will support the otherwise “inefficient” structures (small-scale, part-time, and co-operative farms) and non-market forms (such as subsistence and cooperative farming). As a result, the relative sustainability of these farms will increase - small scale-operations will become viable; cooperatives will be able to pay rent; subsistence farming will turn to be more profitable etc. Besides, direct payments will tend to increase the farmland price and rent, and thus enlarge the costs for land supply in the biggest farms<sup>18</sup>. At the same time small-scale operators (which are mainly organised on owned land) will retain the entire subsidies and see their income increased. Subsequently transformation of land management to the most effective forms as well as restructuring of farms will be delayed.<sup>19</sup> What is more, the EU funds will be effectively used to subsidise directly the consumption (food self-supply) of a good part of Bulgarian population.

Third, significant funds for rural development will be available from the EU exceeding 4.7 times the relevant current level.<sup>20</sup> This amount of resources will let more and relatively smaller farms to get access to public support scheme and invest in modernisation of their enterprises. Furthermore, new important activities will be effectively financed such as diversification of farming; commercialisation of local products; renovation of villages and infrastructural development; agri-environment protection and animal welfare; support for less-favored areas and regions with environmental restrictions; afforestation of farmland; restructuring of semi-market holdings; Community standards; food quality; producers' organisations etc. All that will let carrying out essential activities for agriculture and rural areas - commercialisation and diversification of farming, introduction of organic farming,

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<sup>17</sup> Bulgaria will be in position to add the direct payments from the national budget up to 55% from the EU level of direct payments in 2007, 60% in 2008, 65% in 2009, and by 30% over the applicable levels of the relevant year since 2010 (MAF).

<sup>18</sup> Currently a half of UAA in unregistered farms and 90% in legal entities is leased land (MAF).

<sup>19</sup> That is not necessarily bad as far as keeping extensive and family character of farming is concerned.

<sup>20</sup> For 2007-2009 are envisaged 733 million euro plus resources from the EU Structural Funds (MAF).

maintaining productivity of and biodiversity on currently abandoned farmland, revitalising mountainous agriculture etc. That evolution will bring additional income for farmers, and create new employments in rural area, and enhance overall performance and the sustainability of individual farms. Besides, it will extend the activity of some of the existing structures (co-operatives, group farms, firms) which could specialise in new functions such as environmental preservation, maintenance of the farmland etc., and see their long-term sustainability increased.

Nevertheless, if actual system of governance (prioritising, management, control, assessment) of public programs does not change, the funds will continue to benefit exclusively the largest structures and the richest regions of the country; more abuses will likely take place; and the CAP support will not reach the majority of farmers and contribute to diminishing socio-economic divergence between regions. In addition, some of the terms of specific contracts for environment and biodiversity preservation, respecting animal welfare, keeping tradition etc., are very difficult and expensive to enforce and dispute. In Bulgarian conditions the rate of compliance with these standards will be even lower because of the lack of readiness and awareness, insufficient control, ineffective court system, low transparency, domination of “personal” relations and bribes etc. Correspondingly we could expect that more farmers than otherwise would enroll will wish to participate in such scheme (including the biggest polluters and offenders). Subsequently, the outcome of implementation of that sort of instruments would be less than the desirable level. In order to avoid a probable misuse of funds more efforts is to be invested in increasing farmers and publics understanding, and in assisting voluntary actions of producers and interest groups.

Forth, the CAP financing will support the modernisation of the farms structures through expanding the variety of contractual arrangements and organisational innovations in agrarian sector - specific sort of contracts, new type of producers associations, spreading vertically integrated modes etc. Moreover, special forms will gradually emerge allowing agrarian and rural agents to take advantage of the large public programs - specialising in project preparation, management, and execution; investing in “relations capital” or “negative” entrepreneurship; forming modes for lobbying and farmers’ representation; developing formal coalitions for complying with eligibility criteria for public support (e.g. minimum farm size for direct payments, membership requirements for producers organisations etc.).

The implementation of the CAP will also contribute to foster restructuring of commercial farms according to modern market, technological, and institutional standards. Farming will be increasingly characterised by domination of larger and highly effective (competitive) enterprises which will concentrate the activities in all major sub-sectors. At the same time the process of restructuring of the great part of Bulgarian farms will not be positively affected. Less effective small and subsistence (cooperative and individual) farms will continue to persist and even benefit from the public support.

Only 15 % of farm managers are under 45 years old whereas 40 % of them are older than 65. Also more than a half of agricultural employees are in pre-retired or retired age. That puts serious restrictions on the effective farm adjustment and enlargement (low investment activity and entrepreneurship, limited training capacities; no alternative employment opportunities etc.). Besides, there will be a huge exodus of farm managers and labours in the near future, and additional measures need to be taken to attract new comers (successors and others).

Furthermore, prospects for changing “high sustainability” of small-scale and subsistence farming is mostly determined by the overall development of the economy, and increasing non-farm employment and income opportunities. However, it is less likely to have significant positive changes in that respect (overall unemployed rate is above 12 % reaching in rural areas to 14.6 %). At the same time, this type of farming (especially miniature “domestic” livestock operations) will hardly be able to meet the EU quality, veterinary, phito-sanitary, environmental, animal welfare etc. standards. On the other hand, it will be practically impossible (costly or politically undesirable) for the authorities to enforce the official standards in that huge informal sector of the economy. Therefore, these less effective structures will continue to exist in years to come.

Fifth, the costs for respecting requirements of the special agri-environmental programs by different farms (direct expenses, lost income etc.) will vary considerably and they will have unequal incentives to participate. Having in mind the voluntary character of most of the CAP support instruments we should expect that the biggest producers of negative agrarian externalities (large polluters and non-compliant with modern quality, agronomic, biodiversity, animal welfare etc. standards) will stay outside of these schemes. On the other hand, small contributors will like to join since their related costs would be insignificant comparing to received net benefit. Moreover, the Government is less likely to set up high performance standards because of the strong internal political pressure from farmers and possible outside problems with the EU control (and sanctions) on cross-compliance. Therefore, CAP implementation will probably have a modest positive impact on the environment in Bulgaria.

Lastly, there will be “practical” difficulties for introducing the CAP in public and private sector alike – information and technical deficiency, lack of staff and experience, enormous initial costs (registrations, paper work, formalising relations with landlords, preparing project proposals etc.). Thus we are to expect some time lag until the “full” implementation of the CAP, depending on pace of building effective capacity as well as training of (acquiring learning by doing experience) administrative staff, farmers, and other agrarian and rural agents.

## CONCLUSIONS

A specific farming structure dominates in Bulgaria from the beginning of transition, now consisting of numerous subsistence and small farms; few large farms, cooperatives, and agro-firms; and widely used informal, vertically integrated, and mix forms. General support to farming has been in an increase but is still far bellow the European level. Besides, only a fraction of farms benefit of some form of public support most of them being large farms, cooperatives, and tobacco producers. Farming is still an important income source for a good part of population. However, there is a significant gap in the monetary income in the large and some smaller-scale (intensive) enterprises, and the great majority of farms. Besides, development programs contribute less to agrarian and rural sustainability, and to decreasing the divergence between richer and poor regions of the country.

Assessment of likely short-term impact of the CAP implementation in the country shows that it will increase the sustainability of farms bringing net financial benefits, enhancing competitiveness, and improving environmental performance. However, different farms and regions will gain unequally from the CAP introduction. The chief beneficiary from the direct payments and other support measures will be the biggest farms in the most developed regions of the country. CAP programs will also give new possibility for extending activities of

existing forms and bring to a life new organisational arrangements (partnerships, joint ventures, associations etc.). All these will create more employment and income opportunities, and revitalise the agrarian and rural economies. On the other hand, some effective (smaller-size, family) structure and livestock farms will have no or limited access to EU funding. Consequently, income and performance gap between farms of different types, sub-sectors and regions will widen unless special supplementary measures (“coupled” with production and regions) are taken. Besides, CAP will likely support “ineffective” and non-market modes (part-time and subsistence farming, production cooperatives), and therefore raise their sustainability and delay further restructuring.

Research of the likely and actual impact of the CAP on farm structures in the new and prospective member countries is to continue applying modern western methodologies including achievements of the institutional analysis. The assessment framework should include multi-disciplinary efforts in order to identify the specific economic, institutional, behavioral, cultural, historical etc. factors affecting sustainability of different farms. Next, the impact of the CAP on different economic, social, environmental, inter-generational etc. aspects of farms sustainability is to be clarified and assessed. Furthermore, intersectoral approach should be incorporated into analysis, and the net impact on farm, household, and rural economy evaluated.

Research on governing modes of agrarian and rural sustainability in the specific East-European conditions should be extended as well. That will let identify the critical factors in each country and suggest directions for improving management of the CAP, and other programs and forms of public intervention. It will also help design appropriate support policies for prospective market, private and hybrid modes, and thus accelerate the overall restructuring of the economy.

#### **Note**

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# **The role of agriculture in rural development during the transition, the case of the Czech Republic**

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## **Introduction**

Interrelations between agriculture and rural development (RD) are ambiguous. It is particularly true in the New Member States (NMS), in which the communist regime functioned up to 1989 and where – except Poland – agriculture was collectivised and nationalised. Collectivisation and nationalisation resulted not only in significant and often irrational concentration of agricultural production in (state or quasi-cooperative) enterprises with management similar to industrial sectors, but it affected the whole social and economic life of villages and rural areas. Collectivisation enabled to command (centrally plan) otherwise heterogeneous small scale rural/farm economy especially in remote and sparsely populated areas. On the social side, peasants and farmers turned into agricultural workers which enabled division of labour and specialisation, but made labour easily replaceable allowing migration out and in agriculture (mainly between agriculture and industry). These and centralised governance contributed to the erosion of the traditional social system of villages and their “urbanisation”. Collective farms played an important role in the social system of a socialist village. Although the extent varied among the Soviet-block countries in most of them collective farms organised a substantial part of social life: organising cultural and sport activities, providing lunches for elderly people, providing various goods and services including those for households’ plots and animal husbandry and not only for agricultural workers but all who lived in the village.

Agricultural reforms of the early 1990s aimed at the recovery of ownership rights to land and non-land assets (based on restitution, privatisation (sales) and transformation of cooperatives) and market liberalisation allowing the necessary restructuring of the farming sector for improving its efficiency and competitiveness (Swinnen, 1997). In many countries collective farms collapsed during the turbulent period of initial transition, and with them an important provider of socio-economic infrastructure in the rural areas. In the Czech Republic agricultural cooperatives have survived, however have struggled to adjust to new economic conditions and to re-define their social role at the same time (Drlík, Horská, Koutný, Ratinger, Spěšná 2004).

Collectivisation and industrialisation reshaped the landscape and countryside significantly; lot of landscape features were removed or vanished due to large scale technologies. Since the middle of 1970 agriculture had become a significant polluter of water and soil and the public had started to recognise the adverse effects of agriculture. Gradually, the state introduced regulatory legislation which was further strengthened after political changes in 1991.

Production decline associated with lowering application of fertilisers and pesticides reduced part of the adverse effects, but abandonment of marginal land created the new threat to landscape and biodiversity (Hagedorn, Luetken 1999, Ratinger, Pražan 1999). In most of the CEE countries – now the new Member States a debate on other non-food and “non-production” importance of agriculture opened in the middle of 1990s. The importance was (and still is) seen in providing landscape stewardship and in providing/securing income and food for the otherwise unemployed population in marginal regions where other industries collapsed during transition. Moreover, large potential has started to be recognised in letting farmers voluntarily modify their practices in order to improve environment (water, biodiversity, etc.). While support to agricultural multifunctionality has been gradually incorporated in the agricultural policy (in the Czech Republic since 1998), the role of agriculture in rural development has been to large extent simplified to only “what is good for farms, it is good for villages”<sup>1</sup>, and agricultural policy did not address the rural development at all for long time (until the pre accession rural development programme - SAPARD was launched). Based on the Czech experience, the paper attempts to go deeper in relations between agriculture and RD in the context of structural adjustment of the farming sector and agricultural policies applied after 1989. In part 1 a purposeful classification of the Czech agricultural-rural areas is presented as an instrument for the evaluation and shaping agricultural and RD policies. The key domains of the integration of agriculture with RD are shown in part 2, followed with a concise recapitulation of the Czech agricultural policies after 1989 in part 3. Impacts of the applied policies, especially the policy after EU accession (2004 – 2006) on the relations between agriculture and RD are presented in part 4. In final parts 5 and 6 it is discussed, whether hitherto and prepared (under EAFRD) policy measures are sufficient to address RD problems, where potentials and barriers to improve the relations are and which suggestions are reasonable for the future research in this field.

### **Typology of the Czech agricultural/rural areas – needs to territorial approach to policy-making**

Agriculture is carried in all parts of the country and areas with significant rural features extent on most of the Czech territory. According to the OECD typology applied at the NUTS 5 level<sup>2</sup> 79 % of the Czech municipalities with 23 % of the Czech population and covering almost 75 % of the Czech territory are classified as rural municipalities. According to the same typology on the NUTS 3 level<sup>3</sup> the whole Czech territory except Prague and Moravia-Silesia region can be classified as rural territory. Applying the NUTS 4 level, the Czech territory has:

- 7 districts with 4 % of the Czech population and covering 11,5 % of the Czech territory as predominantly rural regions;
- 57 districts with 63 % of the Czech population and covering 79,4 % of the Czech territory as significantly rural regions;

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<sup>1</sup> Compare with Drabenstot 2003, page 51: ... US rural policy has essentially been built on three foundations. First, it was a one sector policy. The presumption was that helping agriculture would help all the rural economy. ...

<sup>2</sup> Rural municipalities are those with the density population lower than 100 inhabitants/km<sup>2</sup>.

<sup>3</sup> According to the share of population in rural municipalities in the total number of the population in a region.

- 13 districts with 33 % of the Czech population and covering 9,1 % of the Czech territory as predominantly urban regions.

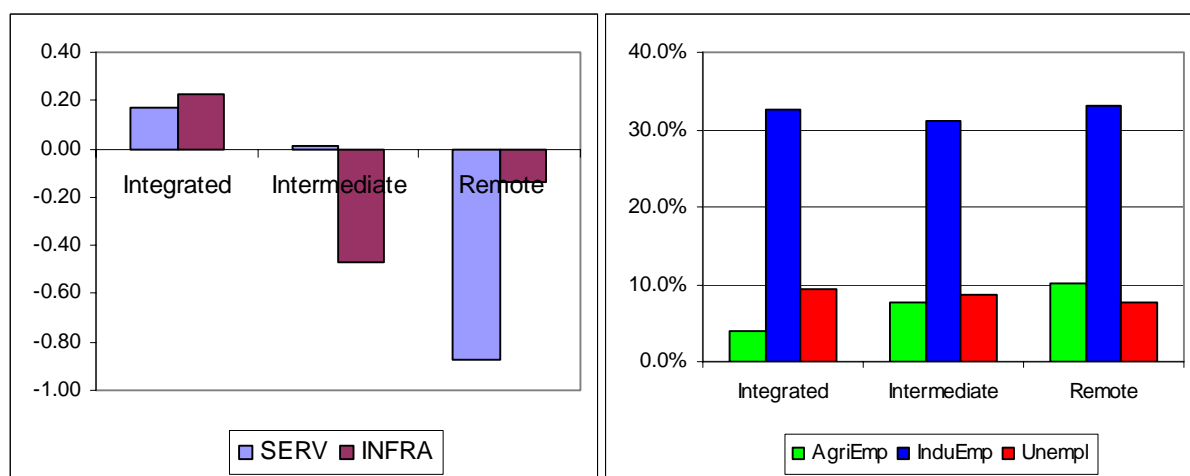
Due to the heterogeneity of conditions within administrative territorial units, OECD and similar typologies relating only on population density, and particularly when applied at NUTS 4 and higher levels, seem to be too rough and insufficient for understanding rural problems and designing appropriate policies.

Ratinger et al (2005) structured rural areas further according to their degree of integration with the national economy (see European Commission 1997):

- Integrated rural areas, with an employment basis in the secondary and tertiary sectors, but with farming still being a key use of land. Facing potential threats to their environmental, social and cultural heritage, some of these areas, relatively close to big cities, risk becoming dwelling areas only and not working areas ("rurbanization"); others are developing in their own right;
- Remote rural areas, with the lowest population densities, often the lowest incomes, and an older population which depends heavily on agricultural employment.
- Intermediate rural areas, being between integrated and remote areas.

Over 50% of rural areas with 67% of population were classified as integrated, 26 % as intermediate with roughly the same share on population, while remote areas expanded on 23% percent of the rural territory giving home only to 13% of the rural population. Although the authors used simple method for distinguishing these classes (the share of agriculture on the district labour force) they could show that it picked up significant differences in physical and social infrastructure, employment and employment structure and other socio-economic indicators (Figure 1).

**Figure 1 - Characteristics of rural regions**



**Source:** Ratinger et al., 2003, Strategy for integrated agricultural and rural development.

Another typology of the Czech rural areas has been developed by the Faculty of Natural Sciences, Charles University Prague. The Czech rural territory is structured in five classes using historical, social, economic and geographical criteria: suburban zones, rural areas with a „rich agriculture“, rich Sudeten, poor Sudeten, inner periphery and Moravia-Slovakia borders. There are other regional typologies specifically applied in the Czech Republic beyond pure agricultural and rural criteria. For example, the official Czech Strategy of Regional Development differentiates three classes of vulnerable regions: the structurally handicapped regions, economically weak regions and regions with a high unemployment.

In the framework of the TERA project<sup>4</sup> a typology of rural areas has been preparing, with the particular aim to identify remote rural areas and to propose changes in policies to address more effectively and efficiently problems of rural development in the EU. The suggested typology follows very much the typology suggested by the Politecnico di Milano<sup>5</sup>. For the NUTS 4 level (77 districts)<sup>6</sup> 18 demographic, sociological, economic, infrastructural and historical indicators from available statistics and surveys at the NUTS 4 level have been selected. Using the factor analysis methodology for the selected indicators<sup>7</sup> the Czech territory is structured by their “score of rurality” into 6 regional categories/clusters as follows (see Appendix, Map 1):

- 4 districts with 19.7 % of the Czech population and covering 1.4 % of the Czech territory as non-rural/city areas (Prague, Brno, Ostrava, Pilsen);
- 8 districts with 10.9 % of the Czech population and covering 6.5 % of the Czech territory as areas with the lowest level of rurality;
- 19 districts with 21.3 % of the Czech population and covering 25.5 % of the Czech territory as areas with the low level of rurality;
- 11 districts with 14.7 % of the Czech population and covering 15 % of the Czech territory as areas with the medium level of rurality;
- 24 districts with 22.7 % of the Czech population and covering 33.5 % of the Czech territory as areas with the high level of rurality;

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<sup>4</sup> Territorial Aspects of Enterprise Development in Remote Rural Areas, the Sixth FP EU, 2005 – 2008. The RIAE is responsible for the definition of indicators (criteria) and their application to identify the “remoteness” of rural areas.

<sup>5</sup> A Typology of Rural Areas in Europe: Indicators on Strength and Weakness of Rural Territories and Selection of Areas (NUTS 3), Strategic Study: Towards a New Urban Rural Partnership in Europe. Politecnico di Milano, 1999. The typology differentiates integrated rural areas, intermediate rural areas and remote rural areas.

<sup>6</sup> The other NUTS levels showed to be unsuitable for the Czech Republic for the purposes of the TERA project.

<sup>7</sup> The applied indicators are as follows: A – General indicators: share of deserted houses, share of houses for recreation, score of agro-environmental sensitivity, share of LFA in UAA, share of agricultural and forestry land in the total acreage, share of UAA in the total acreage of agricultural land (a proxy for the land abandonment); B – Demography: number of population/km<sup>2</sup>, share of population above 64 age (without the district town), difference in population 2001/1991 per 1 000 inhabitants (without the district town); C – Settlement: share of population in the district town in the totals number of population, number of elementary settlement units/100 km<sup>2</sup>; D – Economy: share of active population, level of unemployment, share of employment in agriculture, forestry and fishery, share of tourists in their total number, share of commuting active population; E – Infrastructure: number of elementary health centres to number of municipalities, km highways in the total km of roads.

- 11 districts with 10.7 % of the Czech population and covering 18.1 % of the Czech territory as areas with the highest level of rurality – remote rural areas.

This typology will be applied in the next research to elucidate more the interactions between agriculture and RD and the effectiveness of RD policies.

However, none of the above classification has really got reflection in the Czech “rural development” policies during the period 1990-2005. The common agricultural policy and rural development policy is applied on the whole territory, regardless the obvious heterogeneity of the country and its regions. The structuring of agricultural regions into the LFA categories<sup>8</sup>, based on soil quality and demographic criteria, seems to be an exemption but the respective payments and higher investment grants address only little from the specificities of rural areas<sup>9</sup>. Similarly measures for the support and development of SMEs do not distinguish between regions.

### **Interactions between agriculture and rural development**

The tremendous growth of productivity during last few decades and post reform expansion of the modern supply-chain production system has gradually led to the state when relatively small number of farms engage in commodity production and the tendency is that the production will concentrate only into a few agricultural regions (see also OECD, 2003). In most of the EU rural areas, the economic role of agriculture in the regional development has shrunk, but obviously farming has remained the key land user shaping countryside environment. In some regions, particularly in the NMS, subsistence agriculture is still important or re-emerged during the transition. However, this might be regarded as only temporary effect of structural adjustment of the economy; one can expect that with deeper integration of these economies into the EU common markets agriculture will commercialise again, productivity will grow and in the end population engagement in farming will drop dramatically. The diminishing role of commodity agriculture on one hand and the increasing societal demand for nature and landscape conservation and for countryside as the place for tourism and recreation, on the other hand, have been bringing significant challenges for rural areas (in the enlarged European Union) – a need for modifying development policy objectives and rethinking governance structures.

In this paper, we avoid debating, what is “rural” development, since there is no unique concept and terminology, but we indicate where agriculture, farming and farm household economic and other activities significantly (crucially) interact with development of regions. We recognize several categories of such interactions:

*Contribution to regional employment:* agriculture and farms provide (on site) job opportunities for rural population;

*Interaction with environment:* Agriculture provides stewardship of landscape, participates in nature conservation and in preservation of specific cultural-historical amenities. However, there are also adverse effects of agricultural production like soil, water and air pollutions, erosion, declining biodiversity etc.

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<sup>8</sup> LFA include about 50% of the Czech UAA (MoA, 2005)

<sup>9</sup> Farming is just considered to be weaker in these regions due to unfavourable soil and climate conditions.

*Economic interaction:* Agriculture and farms are integrated into regional economy by

- i) providing raw materials for locally based food industry;
- ii) carrying out non-agricultural production (including food processing, hand-crafts, etc.) and services (like tourism and recreation, repairing cars, etc.) for local (regional) and national (global) markets
- iii) using farm resources outside the farm: local off-farm investment, local off-farm use of labour, renting farm assets to local business.
- iv) using local services and locally produced goods as inputs for production.

*Interaction with local physical infrastructure*, which comprises its use but also maintenance and provision (e.g. roads and paths).

These interactions, better their positive, but also negative effects are often termed as multifunctionality of agriculture, particularly if they result from technological or institutional jointness of agricultural production (Durand, Huylenbroeck, 2003).

The last but definitely not the least important interaction rests in the fact that *farmers and farm enterprises carry important stocks of human and social capital* which they acquired over shorter or longer history of cultivating land and doing business. These assets are often very locally and land use specific and not easy transferable. Therefore, they require a specific approach. We can demonstrate on the case of the Czech Republic that these capitals have often been often undervalued when policies are designed. In spite of all the investment effort of communist and post communist governments, sixty years after German population was forced to leave the “Sudeten” regions<sup>10</sup>. Many of these regions still lag behind the inland regions in terms of economic performance (production, GDP per capita, wages), employment and overall business activity (Doucha, Trávníček, Bednaříková 2005). Because of problems with the identification of land ownership titles (as a consequence of a special allotment system applied in these regions after 1945) there is a higher risk of land abandonment. But policies have rarely taken social and human capital into account. Most of the state land is expropriated Germans’ land therefore allocated in Sudeten, and in turn, most of the land there is state land. But agricultural land reforms did not expect that on the state farms historically naturally located in these regions could be acquired valuable human and social assets and put them at risk by hesitating to sell land to those who engaged in agriculture for the last 60 years. Later, under the threat of collapse of farming at the large scale the government took correcting actions. Over the 10 year history of the contest Village of the Year – no village was from the “Sudeten” regions.

#### **Four generations of the Czech agricultural and rural policy**

In our understanding integrated agricultural and rural development policy is a policy which aims at interactions between agriculture and regional development as identified above. Our effort is to document the transition from sector base approach and more or less single objective (farm income) policy to more place based approach and multiple objective policy

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<sup>10</sup> Most of the regions along the borders with Germany and Austria, sometimes going inland by 50 and 60 kilometres.

(improvement in all dimensions of sustainable development) as it happened during last decade in the Czech Republic.

In principle we can distinguish four generations/stages of the Czech agricultural and rural policy:

- *transformation policy* up to 1999; guiding and accompanying the economic transition of the agricultural sector
- *pre-accession policy* 2000 - 2003 including pre-accession EU structural supports through the SAPARD<sup>11</sup>; the policy converging to CAP
- *adoption of CAP*; the policy shortly after EU accession (2004 – 2006);
- full agricultural and rural policy starting after 2006, particularly related to the adoption of CAP reform and the new rural development directive (EAFRD<sup>12</sup>).

The level and structure of supports<sup>13</sup> up to 2004 are shown in Table 1. The permanently increasing level of supports (in nominal terms) during 1995 – 2004 is evident. The supports jumped more than twice in 2004 compared with the annual average 1995 – 1999. Almost the half of the supports in 2004 belonged to the category of direct supports (SAPS and TOP UP payments)<sup>14</sup>; rural development supports (HRDP<sup>15</sup>) maintained a similar relative position during the whole period of 1995 – 2004. Investment supports under the Operational Programmes (OP) are considered only after 2000, it means after the introduction of the SAPARD (up to 2000 structural investment supports are treated as state aid, which are still partly applied even after EU accession<sup>16</sup>).

**Table 1** Supports of the Czech agricultural policy by sources

Source of support	CZK mil			% from the total		
	1995-9	2000-3	2004 <sup>1</sup>	1995-9	2000-3	2004 <sup>1</sup>
Direct supports	745	2705	12487	5.92	13.79	44.91
HRDP	2218	2869	4033	17.62	14.63	14.50
OP/SAPARD	1	184	1682	0.00	0.94	6.05
State aid	7214	11371	7136	57.30	57.98	25.66
Market price support	2412	2485	2467	19.16	12.67	8.87
<b>Total</b>	<b>12589</b>	<b>19613</b>	<b>27805</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

<sup>1</sup> Estimate.

Source: Own calculation based on MoA 1995-2004.

<sup>11</sup> Special Accession Programme for Agriculture and Rural Development.

<sup>12</sup> European Agricultural and Rural Development Fund.

<sup>13</sup> Only supports from the side of taxpayers are considered.

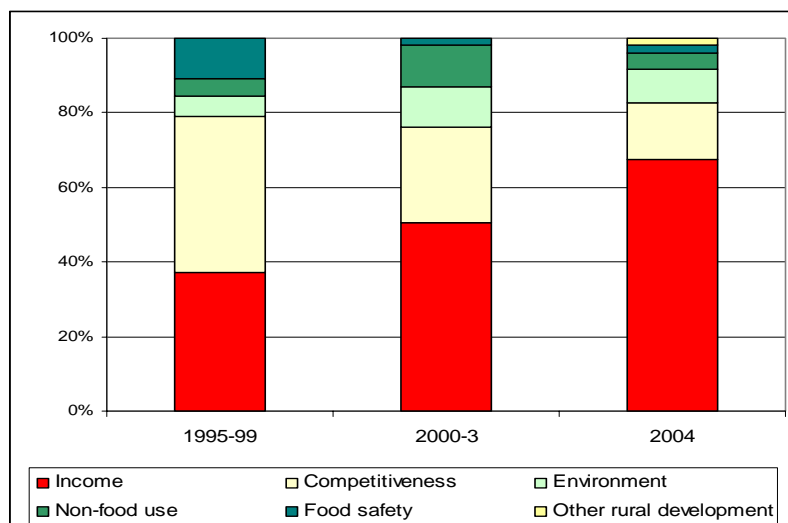
<sup>14</sup> SAPS – Simple Area Payment Scheme, Top-up, also CNDP - Complementary National Direct Payment.

<sup>15</sup> Horizontal Rural Development Plan.

<sup>16</sup> Provided mainly through the Support and Guaranty Farm and Forestry Fund (SGFFF).

Figure 2 shows the distribution of all supports according to long term policy goals (accepted by the Czech government in 2004). Almost 70 % of the budget (most of the budget increase) was directed to support farm income in 2004 (including the LFA and similar payments), to the detriment particularly of competitiveness enhancing investment supports. Agro-environmental maintained its relative importance (10 – 11 % in 2003, 2004). Specific RD supports run only under the SAPARD and thus they are indicated only in 2004 (about 2 % of all supports).

**Figure 2** Distribution of the budget by policy objectives



2004 – Estimates

Source: Own calculation based on MoA 1995-2004

Most of the agri-environmental measures are aimed at water, soil and biodiversity protection; a significant share of the agri-environmental budget was directed to the support of ecological farming, which peaked in relative terms in the pre-accession phase (2000-3, 22%).

Not only direct targeting of incentives but also terms under which other supports are distributed/received are important for achieving environmental goals/enforcing environmental regulations – changing farming practices in order to relax environmental stress, improving animal welfare etc. Keeping land in “good agricultural conditions” is the requirement for receiving direct payments, which terms can be regarded as simplified cross compliance for countries opting for SAPS and top-ups. LFA payments were bound to grasslands and minimum and maximum livestock density.

Although we started with the policy relying on incentives and compensation, the true base of any policy is a regulatory framework. Such a framework – legislation - contributes to designing institutional environment (or simply institutions) which assigns (enable assigning) property rights to parties involved in socio-economic-environmental transactions.

The legislation effort of the first period (transformation) focussed on defining a legal framework for transition (e.g. property and land reforms including land consolidation) and establishing new democratic and liberal society legal system (e.g. the new Commercial law). Enlarged environmental legislation was an integral part of it, since it was recognised that

besides ensuring equal rights of direct participants in economic transactions the rights of those who are affected but have no directly involved must be protected too (and there were deficiencies in this respect in the past). The regulatory framework was further strengthened in the pre-accession period, when it was largely harmonised with the EU legislation.

Environmental regulative (legislative) measures constrain farming practices on the most of the Czech territory; each region (sub-territory) can be characterised by its degree of agro-environmental sensitivity (defined by the laws and decrees); Map 2 in the Appendix refers to nature/landscape protected areas, nitrate sensitive areas, LFA, etc.

Beside restrictions and obligations, penalties and taxes, it defines the domain where policy objectives should be achieved through incentives and voluntary participation. From this point of view the key role for launching and building up integrated agricultural and rural development policy has played the Law on Agriculture settled in 1997 (more times amended after 1997 to comply with EU conditions, e. g. for the land usage registration).

### **Actors - Land users and owners and their structures**

The success of any policy depends on its implementation governance and characteristics of actors. Farm, land use and land ownership structures are basic characteristics of actors, farmers. These structures have evolved gradually since 1991 when the first restitution and land reforms were launched and has gained a specific character and territorial distribution (Map 4 in Appendix).

In particular we emphasise the following features<sup>17</sup>:

- The farm structure shows a strongly dual character: about 80 % of the Utilised Agricultural Area (UAA)<sup>18</sup> is cultivated by only about 6 % of farms.
- About 88 % of the UAA is leased on farms; while only 12 % of the UAA is owned by farms.
- Typical family farms<sup>19</sup> together with part-time (hobby and semi-subsistence) farms occupy only about 13 % of the UAA. However, if we add large full and limited liability individual farms the individually based farming extents almost on the half of the UAA. Corporate form (cooperatives and joint stock companies) occupy about 40 % of the UAA, with a gradually growing share of farms with a real economic power of their managers.

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<sup>17</sup> Source: MoA 1995-2004, Agrocensus 1995 and 2000, The Structural survey for 2003 – CzSO, [www.czso.cz](http://www.czso.cz)

<sup>18</sup> Utilised Agricultural Area equals to the area of agricultural land (about 3.6 mil. ha) included in direct payments programmes since 2004. The official acreage of agricultural land, based on the Czech Cartography Authority, is about 4.3 mil. ha. The difference between the both acreages (about 0.7 mil. ha), highest particularly in border districts, reflects the discrepancy between the official ownership registration of land parcels and the usage registration of land blocks under IACS. Partly the difference can be linked with the abandonment of agricultural land (see further).

<sup>19</sup> Commercial farms managed by the owner and his/her family members.

There is still a large share of state land with specific legal and institutional arrangement for leasing and privatisation. Market of private land suffers an enormous fragmentation of the ownership, while at the same time leased to large farming enterprises (individual or corporate). On the top of it, there are many impediments like problem with physical identification, access to parcels, etc.

For links between farms and RD it is important that about two thirds of the UAA are cultivated by profit maximising farms, while the remaining one third of the land is utilised by farms with a prevailing “income/self-employment orientation”<sup>20</sup>. These two farm categories differ in their entrepreneurial behaviour and responsiveness to policy measures issuing in their different roles in RD.

The business orientation of farms (profit/employment/subsistence maximising) and the high share of leased land and terms securing the land lease contracts affect farms’ “willingness-to-participate” in agro-environmental and similar programmes for the provision of non-commodities<sup>21</sup>. On the highly commercialised farms, the “willingness-to-participate” is always put in the relation to profit forgone from another business, thus the payments of the society for non-commodities have to be sufficiently high to overcome the “profit break-even-points” of farms, while a feeling of sharing socially beneficial effects of the activities has vanished.

### **Impacts of the Czech pre-accession agricultural policy and policy 2004 – 2006 on the relations between agriculture and rural development**

Table 2 shows on selected indicators the impact of policies and markets since political changes in 1989. The most pronounced positive impacts are emergence of ecological farming (reaching almost 6% share on UAA in 2004) and the increase of the share of grasslands. On the other hand, agriculture offered only a quarter of jobs in 2004 comparing to 1989, particularly due to modernisation and improved organisation; labour productivity improved dramatically<sup>22</sup> (Drlík, Horská, Koutný, Ratinger, Spěšná 2004). The worst for the rural development, particularly for rural environment is the extent of fallow<sup>23</sup> land, apparently abandoned by owners; either they are not known or they are too weak (old) or little motivated (owners in cities far away from the countryside) to manage to cultivate their land. Decline of markets definitely initiated land abandonment, but we can also claim that the policies failed to address this issue effectively.

There are two main reasons (and two stages) why Czech farms engage less and less in non-agricultural business: first, non-agricultural activities which were not closely related to agricultural production or farm organisation separated shortly after changes and some collapsed in the open market environment; second, farmers directed scarce resource to activities with the most stable and known environment – to agricultural production, where supports (subsidies, protection) were given and the prospect was that will be given even more.

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<sup>20</sup> A family farm is a typical example of this farm category.

<sup>21</sup> Public or semi-public goods see OECD, 2001.

<sup>22</sup> The labour productivity measured by Gross Agricultural Output (at fixed prices) per 1 worker has grown by 168.9 % between 1989 and 2004 (MoA 2005).

<sup>23</sup> A part of the land abandonment can be assigned to administrative and physical discrepancies between the registered plots and the registered land blocks.

There are also infrastructural weaknesses, hampering the development of on-farm non-agricultural businesses (Chaplin, 2003)

If we look at particular RD policies, like agri-environmental, we can see that the uptake has gradually increased: in 2004<sup>24</sup> about 33 % of the UAA (except 48 % of the UAA in LFA) is involved in an agro-environmental programme. From this area, 62 % is oriented on the maintenance of pastures, 20 % on ecological farming, 17 % on interim crops and 1 % on other activities (wetlands, forestation, bird protected sites, etc.) (MoA, 2005). Similarly, farmers responded very positively to SAPARD; much more investment projects were submitted than expected. Also all zonal agri-environmental programmes were used up.

**Table 2** Impact of markets and policies on “rural development” 1989-2004

<i>Indicator</i>	<i>Unit</i>	<i>1989</i>	<i>1995</i>	<i>2004</i>	<i>Index 2004/1989</i>
Land abandonment	000 ha		300	300	x
Share of arable land on agricultural land	%	75.00	73.00	71.70	95.60
Share of land threatened by erosion	%	35.00	33.00	33.00	94.29
Share of ecological farming on agricultural land	%	0.00	1.00	5.97	x
- of which on arable land and permanent crops	%	0.00	0.50	7.70	x
Number of cows (dairy and suckler)	000 heads	1248	768	574	45.99
Number of sheep	000 heads	399	80	140	35.09
Number of workers in agriculture	000 pers.	533	222	141	26.45
Share of non-agricultural incomes in total farm incomes	%	30.00	20.00	16.00	53.33

Source: MoA 1995 - 2005

In the following we will concentrate on the most important interactions between farming and rural/regional development: water quality, soil management (particularly water retention capacity of landscape and erosion), biodiversity, rural employment and rural infrastructure. The attention is paid to how policies addressed this issues and how farmers responded.

### *Water quality*

The surface and ground water quality has started improving spontaneously due to a rapid and deep reduction of the consumption of fertilizers and pesticides, in a response to worsening farms' financial situation<sup>25</sup>. However, there are threats that the pollution might reverse if direct payments lead to a gradual recovery of the consumption of fertilizers and pesticides in crop production, only partly limited by the implementation of the nitrate directive, even though the Nitrate Sensitive Areas cover about 40 % of the UAA (MoA 2005).

On the other hand, point pollution of livestock production has continued to be a serious problem for the whole transitional period; the environmental regulation concerned only new or large facilities. Nowadays, point pollution will be addressed by cross compliance; but farms might find difficult to accumulate sufficient financial resources to invest in the improvement of facilities, some farms might opt for reducing the production.

<sup>24</sup> Agri-environmental programmes under the HRDP for the period of 2004 – 2006.

<sup>25</sup> The total consumption of fertilizers dropped by about 70 % after 1989. At present the consumption amounts to about the half of the pre-reform situation (about 100 kg of nutrients per 1 ha), with a tendency to increase.

Intensive fishery in water sheds (ponds, etc.) and still locally critical run off of nutrients from fields has led to an enormous eutrophication of water, reducing significantly recreational potential of many rural areas (MoA – MoE 2005).

#### *Water retention and erosion*

Although the problem of reducing water retention capacity of landscape and increasing erosion caused by agriculture – inappropriate farming practices have been known for decades - it remained least addressed (in terms of money and institutional capacity) by the policy and thus there was a very small progress during the transformation. The problem has enhanced (or better has become more apparent) particularly after 1997 with frequent natural disaster as floods and droughts. In spite of the increase of the area of grasslands more than 70 % of the UAA remains under ploughing; on the top of this fact that are the practices including selection of crops, size of fields (blocks) and technology which worsen the situation. Also the cleaning of agricultural water sheds is neglected with negative impacts on the retention capacity of countryside (MoA – MoE 2005). The rural development programme (HRDP) for the period 2004-2006 has already addressed it partly stimulating plating interim crops. The uptake of this measure was high (the budget was used already in the first call 2004 (MoA, 2005).

#### *Biodiversity*

The drop of the consumption of fertilizers and pesticides improved the conditions for number of species and biological diversity of many sites has already slightly increased. Payments to grasslands (LFA payments) and some weakly targeted agri-environmental measures have had high uptake and contributed to the nature conservation in many marginal but landscape valuable areas (see e.g. Ratinger, Krumalova, Prazan 2004). However, special supports for the establishment/maintenance specific natural sites like wetlands, florid meadows, etc. have attracted much less farmers (agricultural entrepreneurs).

The balance co-existence of the nature and arable farming is hampered by extremely large fields (blocks) without breaks with natural sites (hedges, balks, grass-zones, etc.) There is the land consolidation and re-parcelling programme (actually obligatory procedure for each cadastre), which should lead to the necessary re-arrangement of field blocks introducing important green belts and the other landscape features for saving wildlife, eliminating erosion and improving the water retention capacity of the land, but the progress has been very slow so far: only about 400 cadastres from their total number of 13 000 have completed the land consolidation programmes (MoA 2004).

#### *Rural employment and agriculture*

Agriculture is not by far one of the main sectors for rural employment. The share of agricultural employment in the total number of active population differs significantly by districts (see Map 5 in Appendix), depending on the prevailing legal status and size category of farms. The total number of people employed on farms decreased by almost 75 % between 1989 and 2004, and we can expect that the process will continue at slower rate in the future.

Most of the labour reduction since the privatisation<sup>26</sup> has been due to modernisation and improved organisation including changes in production structure and crop rotation. Commercial character of most of the farms and policy aiming at modernisation (for enhancing competitiveness of Czech agriculture) fuelled the innovation process and labour shedding. On the other hand, there is still a large segment of “employment oriented corporate farms” which are less innovative and thus less competitive. They contribute more to rural employment but their prospect is doubtful (see e.g. Curtis, Medonos, Ratinger 2005). Chaplin, Gorton, Davidova (2003) showed that the propensity of farmers to diversify is low. It is certainly partly due to that agricultural policy including its rural development component creates much more secure business environment which in turn does not stimulate managers to create new on-farm non-agricultural jobs for redundant workers. But also it is due to lack of knowledge and inappropriate form of human and social capital what prevents them to diversify into other industries (Chaplin, Gorton, Davidova 2006, Curtiss et al 2003, Ratinger, Pencakova 2004).

#### *Agriculture and rural physical and social infrastructure*

From more case studies (e. g. Trávníček, Bednaříková, Vávra 2005) it is evident that the relationship between agriculture and rural social and physical infrastructures has been gradually changing since the political changes. Most of the social services provided by large collective/state farms for villages deteriorated. More over, some negative interactions with rural infrastructure have continued, the other have appeared: sad monuments of completely abandoned premises of former state or collective farms, creating new “agricultural brownfields” in the countryside; little respect to the rural cultural heritage and the others’ activities in the countryside (now renovated small chapels, field crosses, etc., completely lost in the middle of the large fields, bike-routes and green zones outside of villages are destroyed by heavy machinery, etc.)

The relationship between farms and rural infrastructure/society differ, however, significantly by localities. Ratinger, Krumalova, Prazan (2003) documented the crucial and largely positive role of farms in nature conservation in the White Carpathians.

#### **Are hitherto policy measures sufficient enough to address relations between agriculture and rural development?**

Definitely, the Czech agricultural policy has been addressing a number of problems of rural development. First of all, the policy aimed at smoothing the impact of transition; the policy support was sufficient to save the sector from a complete collapse during the early and most severe reforms and contributed to the emergence of new modern and competitive (at least in the context of the EU common market) agriculture. Agriculture in marginal regions has survived, but has changed. In many protected landscape areas, farmers have started rethinking their roles and their contribution to nature conservation has been recognised by public and the respective public institutions.

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<sup>26</sup> Restitution, sales, transformation of cooperatives which led to emergence of new business and which process ended around the year 1995, as pointed out in the introduction.

However, the policy has remained largely sectoral and partial, lacking holistic perspective, and also the governance structure was narrowly tailored to the market oriented farming sector. Broadening the policy toward regional development would require not only broadening institutional environment (eligibility rules, measures) but institutional re-arrangement. The policy would need to address knowledge and human capital development (reformation). The policy has failed to address dynamics of the development; environmental measures have been more defending “status quo” (maintenance) than inducing positive changes in the land use. The past national and the present common agricultural policy have not prevented the loss of jobs in spite of being agricultural production oriented.

From this point of view, the integration of Pillar I and Pillar II of the CAP and further expansion of Pillar II measures are fundamental for the future of rural region. The Czech Republic has just first experience with the preparation of the new National strategy for RD under the EAFRD for the period of 2007 – 2013. The necessary analysis of the situation has been done and a lot of serious issues have been discussed with farmers and the other stake holders at regional meetings. But there is still long way to go. We hope that the paper contributes to the debate on the future of Czech rural areas.

### **Suggestions for the next research in the field of agriculture and rural development**

Czech experience from the transformation and EU accession suggest that the effectiveness of policy and efficiency of public money differ depending on specificities of farm structures and the nature of rural problems. Some of the New Member States like Czech and Slovak republics or Hungary – exhibit farm structures very different from EU-15 (except East Germany). There is a need to provide a deeper research particularly in the following fields:

- Relationship between the farm structure – farming systems and RD;
- Instruments enabling design more effective and efficient measures of RD, e. g. the development of a deeper typology of rural areas to include more territorial views in the policy-making;
- Institutional analysis of RD, including the identification of stakeholders in RD and their political power;
- synergy of the both components of CAP with other policies relating to land use and development of rural areas (bio-energy, cultural policy, transport, tourism, etc.).

### **Note**

Paper prepared for the Workshop “*Implementing the CAP reform in the new Member States: impact on the sustainability of Farming Systems*” jointly organised by the Directorates-General Agriculture, Research and Technological Development and Joint Research Centre/Institute for Prospective Technological Studies, Seville, 6-7 October 2005.

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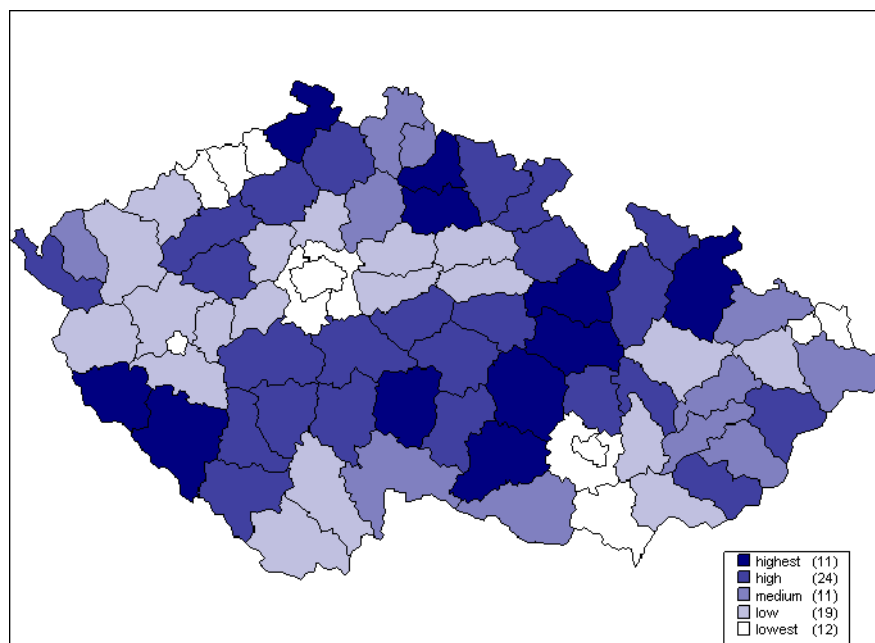
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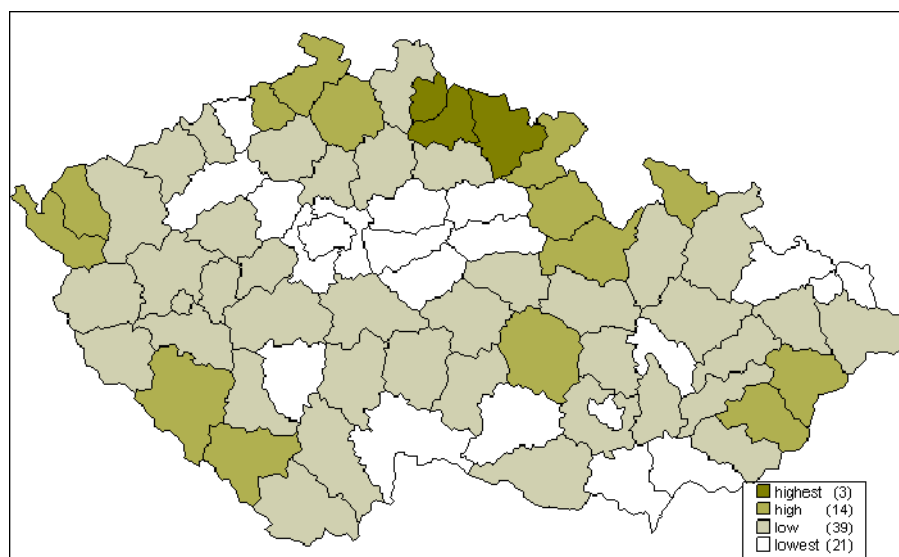
## Appendix

**Map 1 “Rurality” score**



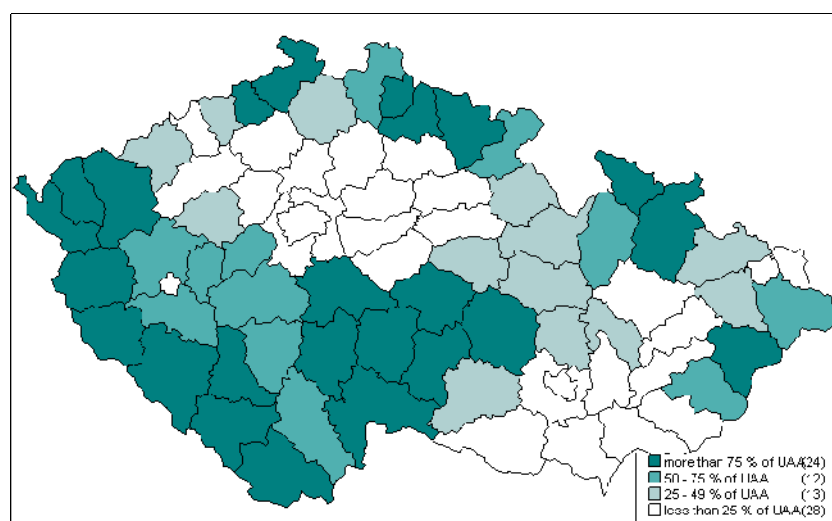
Source: own calculation based on CzSO regional data, [www.czso.cz](http://www.czso.cz)

**Map 2 Agri-environmental sensitivity of the territory in the district breakdown.**



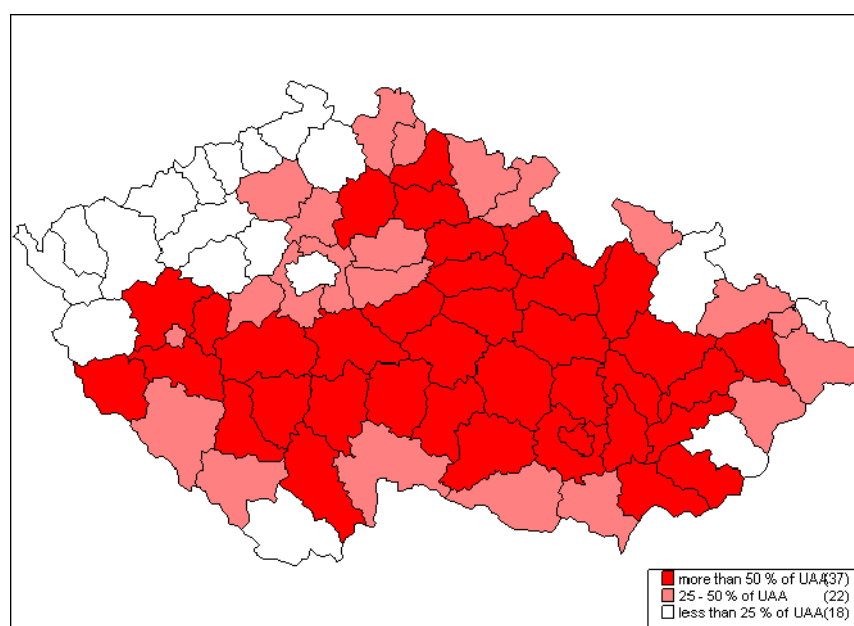
Source: own calculation based on information from the Ministry of Environment

### Map 3 Characteristics of regions by the share of LFA



Source: Own calculation based on Horizontal Rural Development Plan 2004-2006. [www.mze.cz](http://www.mze.cz)

### Map 4 The spatial distribution of corporate farms



Source: own calculation based on Structural survey (CzSO, 2004)

## Some actual aspects of Romanian agriculture and research

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### Abstract

*Romanian agriculture is characterised by a high production potential, but still low productivity, mainly determined by the excessive fragmentation of land, predominance of small subsistence farms, low inputs in the production process, weak development of services and reduced access to credits. The promoted legislation, the measures taken for farm consolidation, a good functioning of markets, the technological transfer, and the implementation of the European aquis create the prerequisites for an increased competitiveness of the sector and for the European integration. Agricultural scientific research has undergone a reform for adapting to the agriculture changes. Increasingly, its contribution to the development of agricultural production performance is correlated with adequate funding, development of the human resources, and with existence of the necessary equipment. A better cooperation with the agricultural universities, access to the themes of the Framework Program 7 will increase the research capacity, necessary for the integration in the European Research Area.*

### 1. General data regarding the Romanian agriculture

Romanian territory is characterised by large landscape variability, with almost equal proportions of geographical forms: 33 % plains, 36 % hills and plateaus, and 31 % mountains.

The agricultural area of 14.8 million ha includes arable land (64 %), pasture and meadows (33 %), and orchards and vineyards (3 %) (Appendix 1).

The climate and soil conditions are favourable for a large range of crops in which cereals predominate. The main crops are maize, wheat, sunflower and forage plants (Appendix 2). The yield level per ha is low due to the improper application of production technologies.

Comparing with the year 1990, the animal stock has dropped to half, and the effective productivity is well beyond the EU ones.

Following the reconstitution of the property rights, the agricultural land was excessively fragmented a fact that seriously affects the production performances and the economic efficiency. The result was a large number of small family farms, mainly subsistence orientated, with a medium size of 2 ha. In some cases, the association between some farmers, as well as the land leasing, led to the emergence of larger and efficient farms, with medium size of 250-300 ha (Appendix 3).

The rural population represents 45 % of the total country population. More than a half of farmers (53 %) are older than 50 years, of which 40 % are over 65 years old. The average predominance creates an environment less receptive to innovation, to farm management improvements, and to development for competitive performance. This is why it is necessary to create a proper framework to stimulate the transfer of agricultural farm management from old persons to the young ones, through the creation of attractive conditions for young people to work and live in the rural areas.

The low performances of the Romanian agriculture are not correlated with its real potential. The agricultural land size (more than 8 % of the EU-25 agricultural land), and the natural and available human resources distinguish Romania as a very important producer and partner for the Central and Eastern European market of agri-food products.

The weak points of the Romanian agriculture are given by the high proportion of small subsistence farms (56 % of which have an average farm size under 3 ha), the low level of productivity and efficiency (due to land fragmentation and lack of capital), low access to credits, and low development of specific services for agriculture.

This situation imposes elaborating and applying an agricultural policy conducting to a competitive performance which can be generated by the following actions:

- stimulating the development and consolidation of family farms (facilities for access to credits and SAPARD funds, production according to market demands, reduction of costs, introducing innovation for increasing productivity and quality, practicing a good management), involving young people in attractive opportunities, organising the supply services, marketing in rural areas;
- supporting the marketing of agricultural products through market mechanisms (producer groups, product councils, increasing product quality etc.);
- applying EU - regulations regarding food safety and animal health;
- institutional reform and establishment of a specific CAP frame;
- sustainable development of the rural area.

## **2. Agricultural research in Romania**

Scientific research has a decisive contribution in promoting the changes in agriculture, especially the technological ones. In Romania, the agricultural research is carried out in specialised institutes and experimental stations creating a network which covers a large diversity of zonal conditions.

The coordinating institution of research is the Academy of Agricultural and Forestry Sciences (AAFS) with a network of 14 institutes and 48 research stations (Appendix 4). At the level of each institute, the research themes are established for the respective domain, which is adapted to the local characteristics of the area where the stations are sited.

Besides organising and maintaining experimental fields, the research institutes and stations organise demonstrative plots and other activities for disseminating the research results to farmers.

The objectives of the research activity respond to the request of developing a sustainable agriculture, correlated with the needs for the aligning to the EU standards. These objectives are the following:

➤ **TO ENSURE the consumption needs of the population by:**

- creating new crop varieties with higher productivity, tolerant to diseases and to unfavourable climatic conditions;
- improving the efficiency of crop technologies;
- improving the animal productivity;
- increasing the coefficient of converting the animal feed (input) into animal products (output).

➤ **TO IMPROVE the quality of agro-food products by:**

- increasing the quality of agricultural products (taste, content of protein, oil, sugar, fibre);
- increasing the quality of processed products according to EU-standards;
- obtaining bio-products.

➤ **TO DIVERSIFY agricultural and food products by:**

- identifying new species with agro-food or technical importance;
- developing new cropping cultivars with various utilisations.

➤ **TO IMPROVE the soil protection against erosion, salinisation, acidifying, polluting, compacting, in order to control and to avoid them by:**

➤ **TO DEVELOP the good agricultural practices appropriate to environment protection and to obtain healthy products. Promoting the sustainable agriculture by:**

- research on organic agriculture and its promotion marketing;
- developing agro-eco-practices, avoiding environmental and agricultural produce pollution;
- conservation of soil potential.

➤ **TO INCREASE the income of farmers and their welfare; farm competitiveness by:**

- conducting research efficiency of agricultural farms;
- conducting research on farm stability.

➤ **TO PROMOTE the projects for rural development in a context of multifunctionality of agriculture**

➤ **TO DEVELOP the human resources by:**

- transferring the research results to farmers practice;
- developing and diversifying the extension activities.

The profound changes which took place in Romanian agriculture after 1990 induced disturbances in the activity of research institutions, mainly owing to land reform and reconstitution of private property, reduction of state financing, the emergence of other new research objectives, and by decreasing the interest for the research work.

In such situation, measures were taken for the restructuring of the network of research units, by concentrating the human and technical resources in stronger research institutes. Consequently, over the last 15 years, the number of research units has dropped from 121 to 62, and the number of researchers, from 2,050 to 950 persons. The research stations with low potential were reorganised into trading companies (eligible destined for privatisation), and those located closely were unified.

For the same reason, the agricultural land administrated by the research institutions and stations dropped from 151,000 ha to 53,000 ha. This land is currently used for experimental purposes and for seeds production. The seeds are delivered to farmers being thus an additional source to research financing.

The preparation for the European integration involves adapting the research to the new requirements in terms of organising, functioning, objectives, financing, responsibility to beneficiaries etc. Thus, research responds to the directives of the agrarian policy, which may assimilate ideas and suggestions offered by research, so that a mutual relation between the two entities (research and agricultural policy) can be promoted.

At present, the agricultural research faces many unsolved problems related to the EU integration and especially to the European Research Area, and the key to success is to achieve being competitive. Therefore the research managers must take into consideration the following:

- to know the real potential of research (human and technical resources, infrastructure);
- research duty to meet internal needs (increasing vegetal and animal production, improving quality, reducing production costs) with respect to competition on the market;
- integration in the European Research Area supposes competitiveness according to EU standards, which makes necessary actions such as:
  - Participation in the Framework Programmes;
  - development of human resources;
  - adequate financing;
  - improving research management;

- development of communication, both with politicians and with beneficiaries (farmers), for ensuring the needed support for research development.

The actual problems of Romanian agricultural research probably are not different from those in the neighbouring ex-communist countries. An analysis of agricultural research would point out or put in discussion some conclusive aspects for its future:

**1. Is (agricultural) research a (national) priority?** The response has always been positive and sustained by all decision makers, but without a real support. Agricultural research as a priority is justified by:

- its contribution to the technological progress;
- the transition to the market economy, which requires competitiveness through high quality and low production costs;
- the necessity of changes in people behaviour, in their thinking and attitude, in order to be more receptive to the economic changes and market requests.
- 

**2. Development of human resources,** having in mind the low/reduced interest to engage in research, mainly determined by the decreased financing of the sector. The reduction in the number of researchers through the retirement of the old researchers and migration to private sector which offered much better salaries. Forming a researcher is a lengthy process and requires sustained funding, and this specificity creates a serious problem to be addressed. In such situation, collaboration with agricultural universities could ensure the emergence of multidisciplinary teams for approaching more complex themes.

**3. Adequate finance for the research tasks.** Reducing the funding for research in the 1990s determined a limitation of the research programmes, an insufficient endowment, as well as the decrease of research personnel. Exclusive financing through project-based competition diminished the research stability and continuity for certain research categories (e.g. development of new varieties, long-term experiments), to partial approach of some problems, without correlating them with adjacent phenomena. The limitation of funding finally also led to the reduction of the research capacity for solving the problems of agriculture.

The goal of agricultural research is to offer/transfer to farmers the information and knowledge resulted from the research and studies undertaken so that farmers would be able to improve their work efficiency, to market in a profitable way their products, allowing them to achieve a higher life standard (Appendix 5). The extension activity is based upon knowing farmers' needs and on the development of their receptivity to the research offer.

Because the efficiency of research is reflected in the progress on farmer activities, it is necessary to reorganise and redefine the Agricultural Knowledge Information System (AKIS), to ensure the functioning of efficient communication between the four key partners: Education, Research, Extension and Farmers.

### 3. Conclusions

- Romania's agriculture is characterised by a high potential, but low productivity, determined by the excessive fragmentation of the land, the predominance of small subsistence farms, low inputs in the production process, the weak development of services and reduced access to credits.
- The promoted legislation, the measures taken for farm consolidation, the good functioning of markets, the technologic transfer and the implementation of the European *aquis* create the prerequisites for an increased competitiveness and for European integration.
- Agricultural scientific research has suffered a reform for adapting to the agriculture changes. Increasing its contribution to the development of agricultural production performances is correlated with an adequate funding, with the development of the human resources and with necessary equipment.
- A better cooperation with the agricultural universities, access to the themes of the Framework Programme 7 will increase the research capacity, necessary for the integration in the European Research Area.

### Note

Paper prepared for the Workshop "*Implementing the CAP reform in the new Member States: impact on the sustainability of Farming Systems*" jointly organised by the Directorates-General Agriculture, Research and Technological Development and Joint Research Centre/Institute for Prospective Technological Studies, Seville, 6-7 October 2005.

### Appendices

APPENDIX 1		
LAND USE IN ROMANIA		
Categories	Area	
	1000 ha	%
Total agricultural land	14800	100
Arable land	9400	64
Pastures and meadows	4900	33
Orchards and vineyards	500	3

## APPENDIX 2 CROPPING STRUCTURE IN ROMANIA

	Area	
	1000 ha	%
Total arable land	9400	100
Maize	3000	32
Wheat	2000	21
Sunflower	900	9.6
Barley	600	6.4
Potato	270	2.9
Oat	240	2.6
Field vegetables	240	2.6
Forage crops	1200	12.8
Other crops	950	10.1

## APPENDIX 3 AGRARIAN STRUCTURE

	Farms		Agricultural area(ha)		Average area ha/farm
	No 1000	%	1000 ha	%	
Small family farms	4462	99.5	7700	55	1.8
Big farms*	22	0.5	6220	45	283

\*Commercial farms

## APPENDIX 4

ROMANIAN AGRICULTURAL RESEARCH

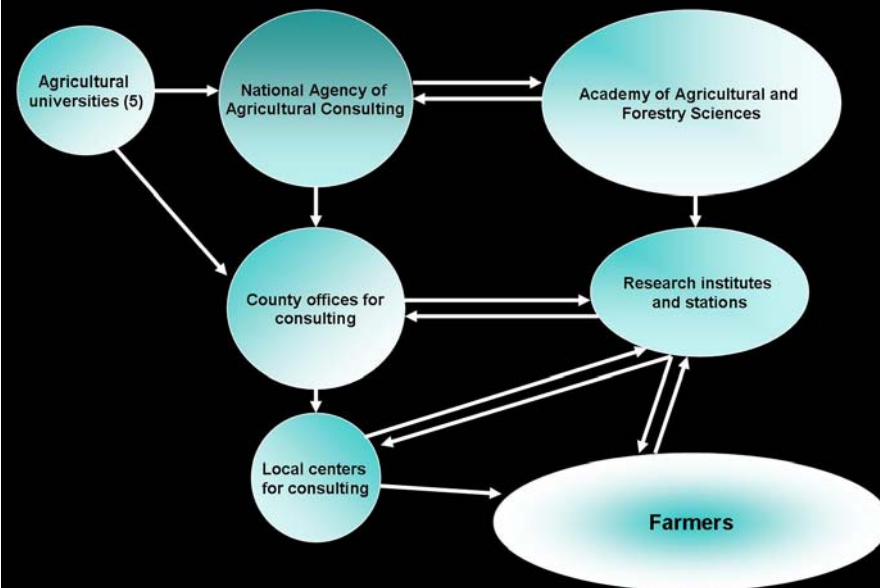
ACADEMY OF AGRICULTURAL AND FORESTRY SCIENCES

*Coordinator of research*

RESEARCH FIELDS:	Research units
Soil Science, Land Reclamation	3
Field crops (breeding, crop technology, plant protection)	18
Horticulture (pomiculture, viticulture, vegetables)	24
Animal husbandry, fishery	15
Veterinary medicine	1
Food industry	1
Agrarian Economics and Rural Development	1
Forestry	1

14 R&D Institutes
48 R&D Stations
2 R&D Private Institutes

## Network of information dissemination



# Prospects for the agricultural income in the new Member States: the case of Latvia

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## Abstract

*A prospective analysis in selected new Member States/Candidate Countries at the 2013 time horizon suggests that, when implemented as foreseen under the 2003 reform of the common agricultural policy, the Single Farm Payment (SFP) scheme would have a positive impact on the agricultural income of various farming systems.*

*Although the results vary among the farming systems, regions, and countries analysed it is obvious that the absence of any type of income support policies is not currently recommendable due to low economic performance of several farming systems. Under such a scenario, i.e. total removal of support, only few of them would be able to continue their current farming activities in the short and medium terms. However, targeted redistribution of the policy support towards the weaker components of the farming structure would improve their agricultural income prospects.<sup>1</sup>*

## 1. Introduction

The present paper reports some results from a larger study developed in the framework of one thematic blocks of IPTS Enlargement Project.<sup>2</sup> The project followed the priorities established by the Lisbon European Council in 2000 to contribute to the successful integration of agriculture in transition into the Common Agricultural Policy (CAP) by providing prospective analyses of the agricultural sector in the EU new Member States and Candidate Countries (NMSs/CCs).

The need for this study was justified on several grounds. First, the expected recovery of agricultural sector, once removed the restrictions imposed under central planning, did not occur during the 1990s in all Central and Eastern European Countries (CEECs). While recognising the obvious differences among individual CEECs in terms of progress achieved during the transition to a market system, it was noted that low food self-sufficiency levels, unfavourable agro-food trade balance with the EU, high levels of agricultural employment,

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<sup>1</sup> Acknowledgments and Disclaimer: This paper reports partial results of a larger study carried out by an international team of researchers coordinated by IPTS. It does not reflect the official position of the European Commission. The authors would like to thank Mr. Yves Plees (DG AGRI / FADN) for the useful input on the methodology, as well as for the input provided by the Latvian team co-ordinated by Mrs Valda Bratka from LIAE (Latvia) over the duration of the abovementioned project. The responsibility for any remaining errors stays with the authors.

<sup>2</sup> “Structural Reform and Competitiveness in New Member States and Candidate Countries agriculture in an Enlarged Europe”. 2005. Mimeo. IPTS, Seville.

and lower commercial quality of farm products compared to the EU standards continued. Moreover, while prices in CEECs and EU gradual aligned, the CEECs low agricultural productivity of the 1990s persisted. On the background of low performance of the sector and relatively high levels of agricultural employment, issues related to the ability of the sector to adapt to changes, to employ resources efficiently and to support the agricultural income of farming community in an enlarged EU were crucial. Second, the impact of EU Enlargement and recent CAP reform on agricultural productivity and income in NMSs/CCs were insufficiently studied at Farm System (FS) level, given the detailed quantitative information needed from such a disaggregated level. The accession in 2004 of ten NMSs brought up several uncertainties related to the ability of their agriculture to adapt and to be economically viable in the enlarged EU, and to the implications at the level of agricultural income of a wider competitive pressure.

On this background, the study aimed to contribute to the understanding of the pre-accession levels of agricultural productivity and income of selected NMSs/CCs and farming systems, the ability to continue farming in the absence of agricultural policies support; and implications of introducing the CAP reform in NMSs/CCs for the economic viability of farming systems.

Czech Republic, Hungary, Latvia, Poland, and Romania were selected for the case studies, considering the importance of their agricultural sector in the national economies, and the availability of suitable data. The quantitative analysis relied on information supplied by the national Farm Accountancy Data Network (FADN) databases. The existence of a functional FADN system was a prerequisite in context of accession negotiations and in the Czech Republic, Hungary, Latvia and Poland the FADN system was already in place and at early stages in Romania.

The paper is organised as follows. Section 2 summarises the main developments of the 2003 CAP reform and implications for the NMSs/CCs. Section 3 describes the methodological steps and provides brief selected preliminary results. Section 4 concludes with some wider land-use related issues.

## **2. Recent developments of the 2003 CAP reform**

The latest revision of the CAP agreed on June 2003 is an important step of the process initiated by the 1992 MacSharry reform and Agenda 2000. The policy objectives of Agenda 2000 are continued in the logic of the reform process started in 1992, namely quality should take over quantity, farm bureaucracy should diminish, and a greater degree of transparency should emerge. By further *decoupling* the policy support from production, and incorporating the majority of existing support schemes into a Single Farm Payment (SFP) paid based on historical references, CAP is expected to become less trade-distorting, less complex, and more market orientated. Farms and agricultural entrepreneurs are the centre of the latest reform and decoupling is seen as a more efficient method of providing income support for farmers. Introduction of *cross-compliance* criteria makes the SFP entitlements conditional of respecting several environmental standards, animal welfare, food safety and quality standards. New incentives are created to encourage agriculture to fulfil its multifunctionality role recognised in Agenda 2000, including sustainable development, conservation, and preservation of rural landscapes. With *modulation* transfers reinforcing the rural development budget, the reform should increase the pace of the rural development process, offering more opportunities to farmers to diversify their farming practices, upgrade the standards of their products, and providing investment support for young farmers.

The CAP reform would also benefit farmers in the NMSs. They will have the advantages of full access to the EU internal market as well as competing with EU15 farmers. In the enlarged EU, markets and prices become considerably more stable, rural development funding provides continued support to upgrade, modernise and restructure the sector, while decoupling offers a simpler support system once the initial phasing-in period of direct payments concludes. However, present agri-food trade balance in NMSs/CCs show a predominance of imported processed agricultural products, while their exports to the EU are still below the agreed reduced duty quotas through European Association Agreements. On the one hand, these are the signs of an agro-food sector still under recovery after the major reforms and dismantling of the 1990s and, on the other hand, of a lower ability of NMSs/CCs producers to exit and compete on European markets.

From the methodological perspective of implementing the CAP in NMSs, several problems need to be addressed. For example, in EU-15, the entitlements to direct payments under the SFP scheme are based on historical reference amounts of past receipts, references which for obvious reasons do not exist in NMSs.<sup>3</sup> In order to allow NMSs to accommodate and gain experience in applying the CAP mechanisms, the approach taken was to provide them transitional flexibility. Moreover, the modulation and financial discipline that are compulsory in the EU-15 were temporarily postponed from implementation in the NMSs, “until the phasing-in of direct payments reaches the EU level” (EC, 2003:4).

### 3. Methodology and preliminary results

#### 3.1 Regionalisation, Farming Systems and Scenarios

The methodology of this study followed three steps, including (1) selection of regions to be studied in each country, identification and characterisation of the most representative FSs for those regions (regionalisation); (2) computation of FSs economic performances taking into account the major national support policies; (3) identification of major agricultural policy scenarios at the time horizon 2013, and policy impact analysis.<sup>4</sup> *Regionalisation* consisted in identification, description and analysis of major agricultural regions of a country. The aim was to identify homogeneous regions in terms of agro-ecological factors allowing comparisons among FSs in terms of their economic performances. Farming Systems were defined as specific combination of agricultural productions, inputs, and labour organisation. Each FS was seen as the result of multiple dynamic interactions among physical environment, society, economy, and technology.<sup>5</sup> As the study relied on secondary information extracted from the national FADN databases, for this study FSs were the equivalent of FADN farm types at second digit of aggregation (i.e. principal type of farming)<sup>6</sup>. *Building scenarios*

<sup>3</sup> “The Commission will propose in due time the measures necessary to extend this reform to the new Member States.” Council of the EU, *CAP Reform, Presidency Compromise*, COM (2003) 23 final, Brussels, 30.06.03), p.2.

<sup>4</sup> The methodological issues of the study benefited from preliminary consultations and input from officers of EC-DG Agriculture (DG Economic analyses and evaluation, G.1 Studies and overall approach) and experts from NMS and CC, including Farm Accountancy Data Network-Liaison Agencies (FADN LA). FADN LAs representatives included those reunited at the Conference “Science and Technology Entry Points for the Integration into a Knowledge-Based EU: The need for prospective technological analysis and foresight” (Warsaw, November 27/28, 2002).

<sup>5</sup> Mazoyer, M., Roudart, L., (1997). *Histoire des agricultures du monde. Du Néolithique à la crise contemporaine*. Le Seuil, Paris ; Tanic, S, Dauphin, F., (2001). *Global Farming System Study. Challenges and Priorities to 2030. Regional Analysis*, FAO, Rome.

<sup>6</sup> [http://europa.eu.int/comm/agriculture/rca/index\\_en.cfm](http://europa.eu.int/comm/agriculture/rca/index_en.cfm)

included (a) scenarios definition using different policy options, and (b) estimation of techno-economic prospects of each FS.

### 3.2 Reproduction Threshold

The Reproduction Threshold (RT), defined as the difference between farming systems net agricultural income per working unit (NI/WU) and the opportunity wage (i.e. annual agricultural wage), acts as a reference against which the viability of farming systems is evaluated. A positive difference indicates an acceptable level of income, eventually accumulation capacity and investment possibilities. A negative difference implies that the FS farming system in question is not economically viable and risks going out of business.

For the purposes of the present study, Reproduction Threshold (RT) was identified using expert knowledge by selecting the agricultural wage of the region (considered as the opportunity wage). This “agricultural RT” offered information about the relative economic conditions of the farmer (family farm) and agricultural worker (commercial company). For family farms it gave a measure of the farmers’ prospects to continue or abandon farming in the medium to long term (when the opportunity-wage becomes the equivalent of the agricultural wage). For commercial companies, setting a profit-related RT was more relevant, the implicit assumption being in that case that operating at loss was not an option for the economic viability (note that this study defined *economic viability* as the capacity of farms to reach a level of agricultural income allowing the farmer to cover the living expenditures and to restart the production process).

### 3.3 Scenarios assumptions and narratives

This section describes the assumptions utilised to build the policy scenarios, and policy impact analysis. In setting the *time horizon* for scenario projections, the choice was made for the year 2013. This choice was supported by the fact that CAP expenditures are frozen up to that year in order to accommodate for the EU enlargement. While the road map is relatively defined until 2013, the picture after that date is relatively uncertain, which legitimates the choice of 2013 as a milestone-year.<sup>7</sup>

The scenario-building methodology included the following steps (a) identification of scenario frameworks, (b) scenario validation, and (c) developing the narratives. With regard to the scenarios approach this study is based of a static model, comparing the current farming situation – based on 2001 data - with its extrapolation to the year 2013 assuming different agricultural policy options. The extrapolation was based on adjusting the 2001 key production variables (gross output, production costs, etc.) with technical coefficients provided by the national experts.

The scenarios approach was based on the idea of minimising the assumptions on the future trend of variables that are by definition uncertain. Alternative approaches - based on either static or dynamic models including several intermediate years - would have implied a higher number of hypotheses on a large number of variables, rendering that way the results less reliable. Compared with the approach chosen for this study, the probability that alternative

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<sup>7</sup> The different elements of the CAP reform will enter into force in 2004 and 2005. The single farm payment will enter into force in 2005. If a Member State needs a transitional period due to its specific agricultural conditions, it may apply the single farm payment from 2007 the latest.

approaches would have lower marginal return (lower ratio between additional information and additional associated costs) has been estimated to be high.

The impact of various scenarios on FSs performance was analysed in terms of variation of indicators of productivity, i.e. Net Value Added (NVA) and Net Income (NI) per Working Unit (WU). NVA was determined by technical and economic parameters on micro scale, i.e. yield, off-farm prices of the produces, production costs, depreciation. Comparing FSs productivity (NVA/WU) at regional level and among regions/countries gave information on their future technical and economic potential. Net agricultural income (NI) was determined by technical, economic and policy parameters, including subsidies, credits, taxations, and policy intervention on prices of the produce. The comparison of FSs net income (NI/WU) to the RT, i.e. the opportunity-income of the farmer, gave information on the potential of the FSs to pursue their economic activity given the policy framework.

### **Scenario 1 Baseline**

The underlying idea here was to follow the principles and targets of CAP reform as foreseen, i.e. improvement of farming competitiveness in the framework of gradual trade liberalisation, enhancing the capacity of rural areas to provide jobs and better environmental quality, allowing agriculture to fulfil its multifunctional role. The background of such scenario was a re-orientation of the entire set of agricultural policies towards the needs of consumers and taxpayers.<sup>8</sup>

The underlying assumption of the Baseline scenario was the application of the CAP Reform following the logic of the proposal of the Mid-Term Review (MTR), i.e. generalised introduction of decoupled Single Farm Payment (SFP), and only punctual market intervention measures.<sup>9</sup> The major assumptions of this scenario were the following: CAP budget maintained as foreseen at the European Council of October 2002; gradual transition towards market oriented production through shifting from market prices support to payments granted directly to farmers (the latter is allocated through the decoupled SFP scheme). The approach was to consider SFP fully decoupled. The regional allocation of SFP entitlements was determined at national levels by the country experts based on objective criteria. As modulation of payments will not apply in the NMSs until 2013 it was not considered.<sup>10</sup>

### **Scenario 2 Market**

The main assumption of this scenario is open market competition in the framework of increased free trade. The agricultural policy is assumed to focus on strengthening the position of EU producers into the world markets through limited policy intervention. Farm restructuring would occur under the effects of market forces, strengthening the position of viable farms.

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<sup>8</sup> EU *fundamentally reforms its farm policy to accomplish sustainable farming in Europe*, IP/03/898, Luxembourg, 26 June 2003  
([http://europa.eu.int/rapid/start/cgi/guesten.ksh?p\\_action.gettxt=gt&doc=IP/03/898/0|AGED&lg=EN&display=](http://europa.eu.int/rapid/start/cgi/guesten.ksh?p_action.gettxt=gt&doc=IP/03/898/0|AGED&lg=EN&display=;)); Council of the EU, *CAP Reform, Presidency Compromise*, COM (2003) 23 final, Brussels, 30.06.03 (<http://register.consilium.eu.int/pdf/en/03/st10/st10961en03.pdf>).

<sup>9</sup> The methodological guidance of implementing SFP in NMS was provided in September 2003.

<sup>10</sup> With regard to NMS “modulation shall not apply [...] until the phasing –in of direct payments reaches EU level” (Council of the EU, *CAP Reform, Presidency Compromise*, COM (2003) 23 final, Brussels, 30.06.03), p. 32.

The CAP budget is assumed being strongly reduced. The main priority is to support general economic growth and competitiveness using the released funds from market price support (that has been eliminated) to support technological change, innovation, productivity, capital investment, human capital improvement, and in general, by focusing on farm modernisation.

Direct income support to farmers is reduced to nil, situation that would increase the pressure for farm restructuring. Market signals lead the decision-making at farm level. It is expected that these conditions would lead to the survival of the most competitive (cost- and quality efficient) farms and create incentives for restructuring the inefficient farms.

The funds for rural development are assumed being directed to support on-farm measures, i.e. Pillar 2 is reinforced with a special emphasis on support to investments for (i) the enhancement of farm modernisation and labour productivity, (ii) land improvements and land consolidation, (iii) improvement of human resources via young farmers' set-up, early retirements and professional training, (iv) realisation of economies of scale in processing and marketing of agricultural products and (v) developing the rural infrastructures connected to agricultural development.

### **Scenario 3 Society**

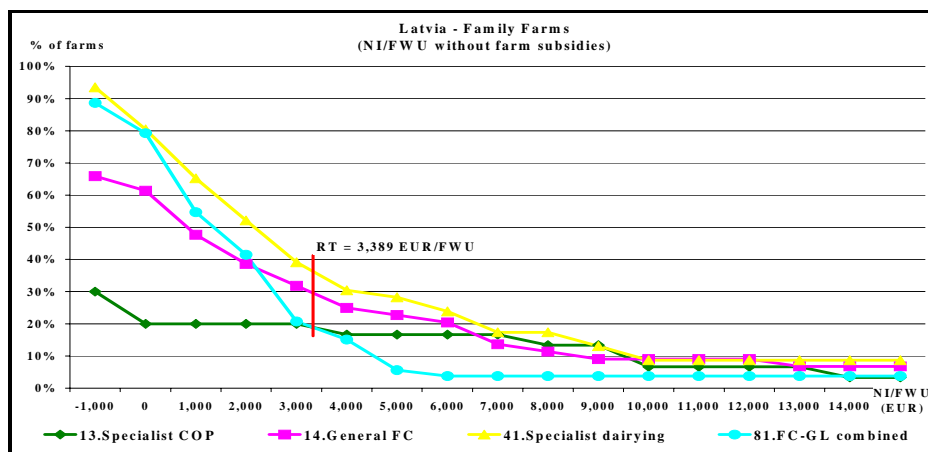
This scenario is built on the hypothetical rethinking of CAP via (i) encouraging the widest application of free trade principles to the primary sector, (ii) strongly modulated direct farm aids oriented towards those farms providing social and environmental benefits, and (iii) a rural policy providing support to rural population affected by increased competitiveness of agricultural markets.

Furthermore, this scenario assumes cutbacks in market support measures, as well as of market and export refunds. Direct payments are completely converted into SFPs and assumed being totally decoupled from production. The principle of modulation is implemented here through SFP capping at EUR 5,000 per farm. The saved funds are equally redistributed among the remaining FSs always maintaining the EUR 5,000 per farm capping. Distribution of SFPs is also submitted to rigid cross-compliance criteria, emphasising the concept that income support should mainly compensate the services provided by farm activities to preservation of environment, landscape and rural heritage.

The Rural Development policy takes only a limited financial advantage from changes set up in the first Pillar, given the constraints on the total CAP budget. Within the second Pillar, priority is given to support farmers' income in Less Favoured Areas, to create of new income alternatives to agriculture (e.g. tourism, crafting, regional products, recreational use of the countryside), environmental protection (related to farming, forestry and nature management), amelioration of infrastructures and basic services in rural areas, enhancement of human resources.

#### ***3.4 Preliminary results for Latvia***

This section reports the preliminary results from Latvia. The country was considered by the national expert as one homogenous region, and four FSs were selected as the most representatives from the 2001 FADN database, namely Specialist Cereal Oilseed and Protein Crops, General Field Crops, Specialist Dairying and Field Crops and Grazing Livestock combined.



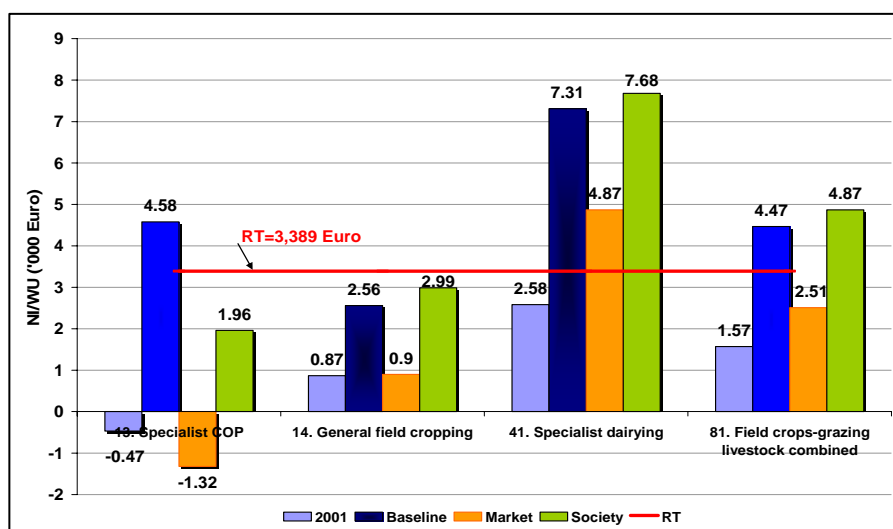
**Graph 1** Percentage of viable Latvian family farms at various levels of reproduction threshold in the absence of policy support (year 2001)

Graph 1 reports the situation in year 2001 for the four selected Latvian FS (where the figures in front of the name of each FS are the corresponding code in the FADN database).

For the analysed year, the value of the RT was set to about EUR 3,300 represented on the Graph 1 by the vertical line. On the horizontal axis is represented the Net Agricultural Income per labour unit (NI/FWU) (subsidies in year 2001 not included), and on the vertical axis, the percentage of farms above the RT. For the FS Specialist Cereal Oilseed and Protein Crops the graph shows that in 2001, given the RT of EUR 3,300 per labour unit, less than 20% of the farms belonging to this FS would be viable, i.e. make sufficient agricultural income allowing to cover living expenditures of the household and continuation of farming activities. Should the RT increase to about EUR 9,000 due to a hypothetical improvement in the general living standards - while no change would occur in terms of this FS performance - its percent of viable farms would fall for to about 12%. Overall, the preliminary results for Latvia indicate that in 2001 the percentage of viable farms in the four selected FSs vary from about 20% (Specialist COP) to 40% (Specialist Dairying).

The results of scenario simulations are presented in Graph 2. The RT is represented here as a red horizontal line (of EUR 3,389) against which the comparison is carried out for each scenario. On the horizontal axis are represented the FSs ranked in ascending order (left to right) according to their land endowment per unit of labour Utilised Agricultural Area (UAA), and Family Working Unit (FWU) respectively); on the vertical axis is the agricultural net income per labour unit in thousand euro.

In the reference year (2001) FS Specialised Cereals Oilseed and Protein Crops reported a negative NI/FWU explained by higher input costs than market revenues achieved. The implementation of the CAP reform and introduction of the SFP indicated a positive impact for all FSs. For three out of four FSs, the NI/FWU was above the RT, while for the FS General field cropping the provided income support seemed insufficient to compensate for the low performance in the reference year.



**Graph 2** Net Agricultural Income per labour unit (thousands Euro) in Latvia for selected Family Farm systems<sup>11</sup>

The complete removal of policy support simulated in the Market scenario had a negative impact on farm viability compared to the Baseline. The Net NI/FWU under this scenario for some farming systems is higher compared to the reference year reflects the technical adjustment coefficients at the time horizon 2013, i.e., a presumably favourable development towards specialisation of some FSs (such as Specialist dairying).

The Society scenario suggested better viability prospects for all FSs when compared to Market scenario, while, when compared to the Baseline, three out of four FSs would be better-off.

#### Note

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<sup>11</sup> Note: First column is the reference year, 2001; remaining ones represent the situation in 2013 year under the assumptions of the three alternative scenarios.

# Possible impact of the EU CAP on the sustainability of farming in Turkey

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## Abstract

*This paper provides an overview of the Turkish agriculture prior to membership negotiations. Agriculture in Turkey is still an important sector for employment, contributes to GDP, and export earning. Turkey also ranks top ten in production of several crops in the world. The basic unit of production is the family-owned farm, family members providing most of the farm labour. Turkey invested in the human capital in order to increase the absorption capacity of the EU funds as well as to increase farm level productivity. Despite the national and international effort and resources, Turkish national extension system is still unsatisfactory. Turkey launched an agricultural reform programme to change unsustainable and costly system of agricultural support policies and issued a policy paper for 2006-2010, in line with that of EU' common agricultural policy. The acquis has been harmonised for the last several years. Implementation of the common agricultural policy is expected to have a different impact on crop and livestock sectors. Crop production will remain mainly competitive, while livestock production will most probably not.*

## INTRODUCTION

With an area of 769 604 km<sup>2</sup> (i.e. 20 % of the EU 25 surface) Turkey is as large as France and United Kingdom together. The population of Turkey is around 70 million, the country representing the second biggest country by population within the EU-28 after Germany. The Turkish population has a higher growth rate, than that in the EU with a different age structure compared to the aging societies in most EU Member States.

Turkish economy is characterised by frequent business cycles but is however small compared to that of EU-28. In the last four years, Gross Domestic Product (GDP) growth rate ranged from as low as -9.5 % in 2001 to a record high 9.9 % in 2004. The share of Turkey in EU-28 GDP would be 4 %. The income per capita, measured in GDP and Purchasing Power Standard (PPS), is slightly more than one fifth of the EU-15, and is the lowest of all EU Member States (5 500 EUR (PPS)) (European Commission, 2003). Per capita income growth has been declining over the last two decades. The annual average growth rate was 3.9 % over the 1980-2004 period indication of a rather stagnant economy compared to other lower-income countries (World Bank, 2004).

## AGRICULTURAL SECTOR

Although Turkey is endowed with a rich natural and human resources, this potential was not taken advantage of over the last three decades (Lundell, 2004). Turkey experienced agricultural-led growth at a fast rate in 1920s and 1930s and a slower rate for the last couple of decades. In the process, the share of agriculture in GDP declined from 38 % in 1963 to 25

% in 1980, and under 12 % in 2004. The pace of growth of agricultural production outpaced that of demand. This expansion facilitated growing domestic supply of food and export of agricultural products. The export served as an important source of foreign exchange. Agriculture also contributed to the labour needed to develop the non-agricultural sector.

There has been a rapid mechanisation in Turkish agriculture over the last three decades. In 2004 the number of tractors increased up to more than one million. The number of combine more than doubled. Likewise, other machinery and equipment have also increased in number, and allowed new agricultural land to be brought under cultivation. This evolution suggests that the average hours of employment of agricultural workers may be declining over time although the number of people engaged in agriculture has remained roughly constant. This fact also suggests that there may be an increasing scope for non-agricultural employment, at least on a seasonal basis. Agricultural income accounts for about 59 % of the total income of rural households. The rest is earned from non-agricultural employment (SIS, 2004a).

There was a huge and continuous expansion in chemical fertiliser use in Turkey since 1960. , increasing from 0.425 million tonnes in 1963 to about 4 million tonnes in 2004. In the recent years, the use of chemical fertilisers has fluctuated but on average has not further increased. On the other hand, pesticides use does not appear to have increased in last two- three decades.

Within the Turkish economy as a whole, the agricultural sector is also stagnant. While Turkish GDP has grown at 3.9 % per year over the 1980-2004 period the growth rate of agriculture has been only 1.2 % per year. In addition, year to year changes of value added of agricultural sector fluctuate widely. The growth rate of the agricultural sector has largely matched with that of GDP. Growth in agricultural sector also depends heavily on weather conditions.

Although the share of the agricultural sector has decreased in the economy to 11.6 % in 2004, the sector still accounts for a very large share of agricultural employment, though this has fallen considerably due to an increasing urbanisation. However, a steady increase in employment in other sectors (manufacturing and services such as tourism) improved the economic conditions, and restructuring phenomena, the share of agriculture in civilian employment dropped from 54.2 % in 1980 to 34 % in 2004. The number of agricultural employees was more than 9 million in the 1980s, decreasing to around 7 million persons in 2004, of which 3.5 million female, (with 2.7 million females working as unpaid family labour) (SIS, 2004b). This labour force is characterised by high labour participation rate, low unemployment, and high illiteracy rate (Oskam *et al.*, 2004).

Increasing urbanisation and the share and changing composition of employment in agriculture has set the pace and direction of structural change in Turkish agriculture. Despite structural change in the Turkish economy, agriculture is still characterised by hidden unemployment, which is an enormous challenge in the economic development. Nevertheless, agriculture is still the most important source of employment in the Turkish economy and by far a more important contributor to total national employment.

In 1980, agriculture accounted for about 57 % of the export value and one percent of the import value. Trade in agriculture can not keep up with the non-agricultural sector. Imports expanded faster than exports, and the shares of agricultural products in total exports and imports are declining. Agricultural exports accounted for only 9.4 % of the total export, and agricultural imports accounted for 4.5 % of the total imports in 2004. However, Turkey

maintains a trade surplus in agricultural and food products. Some selected agricultural indicators are given in Table 1 (SIS, 2005).

**Table 1** Selected agricultural indicators

Indicators	2000	2004
GDP (\$ billion)	199.9	301.8
Agricultural GDP (\$ billion)	26.8	28.7
Employment in agriculture (million persons)	7.8	7.4
Share of agriculture in employment (%)	36.0	34.0
Share of agriculture in GDP (%)	13.4	11.6
Growth of agricultural value added (%)	3.9	2.0
Agricultural value added per employee (\$)	3662	4601
Growth of agricultural value added per employee (%)	22.8	1.2
Domestic terms of trade (1987 =100)	112.4	101.7
Agricultural export / agricultural import	115.7	134.9
Agricultural export / total export	13.0	9.4
Agricultural import / total import	5.7	4.5

Source: Cakmak ve Akder, 2005.

## FARM STRUCTURE

The family-owned farm is the basic unit of agricultural production, and family members provide most of the farm labour. The information on the number and size of holdings are inferred from agricultural censuses (Togan et al., 2005). The picture that emerges from these censuses is the existence of large number of small farms. Agricultural census in 2001 recorded 3 million agricultural holdings. The pattern of land ownership is highly skewed and varies regionally due to differences in incomes and the crops grown. Eighty four % of the farmers own and cultivate 42 % of the area. About 65 % of farms are less than 5 hectares land and 83 % are less than 10 hectares in size. About 6 % of the holdings have a size larger than 20 hectares. In the last 15 years, the total number of agricultural holdings decreased by about 20 %, in line with the fall in the agricultural employment. The national average size of farm holdings is 6.1 hectares, with an average of six plots per farm (Table 2).

**Table 2** Land Size (ha)

Size of holdings (ha)	1963			2001		
	Average Land Size (ha)	Number of Holdings (%)	Area (%)	Average Land Size (ha)	Number of Holdings (%)	Area (%)
0.1-2	9.3	40.9	6.9	9.7	33.4	5.3
2.1-5	33.6	27.9	16.9	31.1	31.5	16.0
5.1-10	71.1	18.1	23.3	68.1	18.5	20.7
10.1-20	136.2	9.4	23.2	134.1	10.8	23.8
20.1-50	284.8	3.2	16.6	273.8	5.1	22.8
50.1- +	1458.3	0.5	13.1	955.0	0.7	11.3
<b>Average</b>	5.53	100	100	6.10	100	100

Source: SIS, 1963 and 2001. General Agricultural Census (1963 and 2001).

Mixed crop-livestock holdings constitute the largest share of all farm types (25 % of total). Field cropping is the second most important specialisation (22.9 %), followed by specialist grazing livestock (20.9 %) and specialist permanent crops (13.2 %).

In terms of location, 35 % of the total agricultural holdings are located in the Aegean and Black Sea regions and 15 % in the eastern zones. More specialised farms are located in Aegean and Mediterranean regions.

## PRODUCTION AND INCOME

The total agricultural area of 39 million hectares consists of arable land (24 million hectares), permanent crops (2.5 million hectares), and permanent meadows and pastures (12.7 million hectares). Fallow land makes up more than 20 % of total arable land. Turkey also has slightly more than 20 million hectares of forested land. The total irrigated area is about 4.5 million hectares i.e. about 19 % of total arable land.

Agricultural area has been changing. The share of cultivated and fallow land in total area has been declining since 1980. Decline in fallow land is even faster due to the fallow replacement program. Over the same period, the area of vegetable gardens has increased, olive trees area and vineyards have decreased, while the fruit and nuts areas have not changed much.

There is a large discrepancy in the estimate of the agricultural area (Oskam et al., 2005). However, once farm and land registration will be completed, the information regarding the use of agricultural land will be more accurate.

Turkey, exposed to both maritime and continental weather conditions, allows the cultivation of a wide range of crops. Climate and geography also have an important role on the location and type of animal husbandry. By international standards, Turkey is a major agricultural producer. Turkey ranks in the top five of world producers of chickpeas, chillies and peppers, cotton, cucumbers, eggplants, lentils, onion, sugar beet, tobacco, tomatoes, watermelon, apples, grapes, pistachios, chestnuts, walnuts, olives, and sheep milk. Turkey is also in the top ten in wheat, barley, rye, almonds, grapefruits, lemons, tea, goat meat, and sheep meat. Turkey is the largest producer of apricots, hazelnuts, and figs (FAO, 2004).

Crops account for about 67 % of the production value and livestock products for 27 %, forestry 3 % and fishery products 3 %. The production of major crops is reported in Table 3.

**Table 3** Agricultural Production (2003)

		Area		Production	
		'000 ha	%	'000 tonnes	kg/ha
<b>Cereals</b>	<b>Total</b>	<b>13 413.6</b>	<b>100.0</b>		
	Wheat	9 100	67.8	19 000	2 088
	Barley	3 400	25.3	8 100	2 382
	Maize	560	4.2	2 800	5 000
	Rice	65	0.5	223	3 434
<b>Legumes</b>	<b>Total</b>	<b>1 514</b>	<b>100.0</b>		
	Chickpeas	630	41.6	600	952
	Dry beans	162	10.7	250	1 543
	Lentils	442	29.2	540	1 221
	Vetches	250	16.5	121	484
<b>Industrial crops</b>	<b>Total</b>	<b>1 285</b>	<b>100.0</b>		
	Tobacco	177.2	13.8	160	904
	Sugar beet	315.3	24.5	12 623	40 034
	Opium	99.4	7.7	47.6	479
	Cotton	629.6	49.0	900	1 430
<b>Oil seeds</b>	<b>Total</b>	<b>1 377</b>	<b>100.0</b>		
	Sesame	44	5.9	22	500
	Sunflower	545	72.9	800	1 468
	Opium seeds	99.4	13.3	52	523
	Peanuts	28	3.7	85	3 036
	Soy beans	27	3.6	85	3 148
<b>Tuber crops</b>	<b>Total</b>	<b>291</b>	<b>100.0</b>		
	Onion	82	28.1	1 750	2 341
	Garlic	11.5	3.9	98	8522
	Potatoes	195	66.8	5 300	27 179
<b>Vegetables</b>	Cucumbers			1 780	
	Potatoes			9 820	
	Green peppers			1 370	
<b>Fruits</b>	Apples			2 600	
	Apricots			460	
	Grapes			3 600	
	Figs			280	
	Bananas			110	
	Lemons			550	
	Oranges			1 250	
	Tangerines			550	
<b>Others</b>	Tea			869	
	Hazelnuts			480	
	Olives			850*	
	Pistachios			90	

Source: SIS, 2004c. Summary of Agricultural Statistics: 1984-2003.

\*Periodicity.

Wheat is the most common crop produced in Turkey, occupies about 9 million hectares of land and represents 65 % total cereals production value in 2003. Annual wheat production is around 20 million tonnes in the last decade. Durum wheat production is estimated to be about 10% - 20% of the total wheat production. The next important crops after wheat are barley

with 20 %, and maize 9 % of total physical production. Cotton, sugar beet, and tobacco constitute almost all of the production value of industrial crops with a share of 50%, 30%, and 15% respectively (Table reports only area and production figures. Values are not reported but evaluated in the text). Chickpeas, dry-beans and lentils are the most important pulses, while sunflower and potatoes are the two important oil and tuber crops respectively. Area devoted to crops has been relatively stable for last two decades. However output varies due to the changing yield that is low in some crops compared to that of EU (SIS, 2004c).

Mediterranean, Aegean, and Marmara regions are the main contributors to the agricultural production, the regions being specialised in fruits and vegetables production. About half of wheat and barley production comes from Southwest, Central and Mid-West Anatolia. Tobacco is produced mostly in the Aegean region, cotton in the South East, Mediterranean, and Aegean regions, sugar beet Mid-Western Anatolia and Western Black Sea region. Majority of nuts are produced in the Black Sea and South East Anatolian regions, while olives are produced mainly on the Western Mediterranean coast.

Livestock production is spread homogenously over the whole country. Milk production is however concentrated in the mountainous part of the Northern Anatolia and South-East Mediterranean regions. Sheep production is located in the Eastern zones of Anatolia, while poultry production is concentrated around the large cities in the western part of Turkey (Table 4 and Table 5).

**Table 4.** Number of Livestock (1 000 heads)

Categories	1995	2000	2003
Cattle	11 789	10 761	9 789
-for breeding	1 702	1 806	1 941
- for cross breeding	4 776	4 738	4 285
Sheep	33 791	28 492	25 431
Goats	9 111	7 203	6 772
Poultry	129 015	245 776	277 533
- broiler	71 690	193 459	217 133
- laying hens	57 325	64 709	60 400
Bee hives	3 916	4 068	4 098

Source: SIS, 2004c. Summary of Agricultural Statistics 1984 - 2003.

**Table 5** Livestock Production (1 000 tonnes)

Categories	1995	2000	2003
Beef	292 450	254 636	290 456
Sheep meat	102 115	111 138	63 004
Goat meat	14 125	18 857	10 087
Poultry meat	282 064	643 436	872 392
Cow milk	9 275	8 732	9 514
Sheep and goat milk	1 212	981	1 045
Eggs*	641 791	844 287	791 674
Honey	68 620	61 091	69 540

Source: SIS, 2004c. Summary of Agricultural Statistics: 1984-2003.

Note: \*16,000 eggs is equal to one tonne.

## **NATIONAL POLICIES RELATED TO THE SUPPORT TO AGRICULTURAL HUMAN CAPITAL. THE POSITION OF EXTENSION SERVICES**

Human capital investment in agriculture is important in several ways: it increases the efficiency of resources and technology, speeds up the communication of techniques, regulations, and opportunities, increases the rate of innovation by farmers and absorption capacity of other sectors of the workforce outside agriculture (Oksam et al., 2004). The illiteracy rate of Turkish agricultural employees is striking: nearly one out of five agricultural employees is illiterate.

Agricultural education in Turkey is carried out in several options. Students may attend a vocational high school or a three-year diploma programme aimed at training qualified people for various professions. These high schools also prepare students for the higher education. There are 18 agricultural vocational high schools (MARA, 2004).

There are 20 Faculties of Agriculture with more than 20 000 undergraduate and Master of Science students, 16 Faculties of Veterinary Medicine with 7 000 students, and 12 faculties of Aquaculture with 3 250 students, 14 Faculties of Food Science, and 10 Faculties of Forestry (YOK, 2005). All these faculties offer 4 to 5 year bachelor programmes, as well as higher education degrees. However, the research effort of these faculties is constrained by high teaching loads, lack of coherent research strategies, weak links with other research institutes, and inadequate research resources (Uzunlu et al., 1999).

Formal agricultural education in Turkey does not necessarily meet the need of the sector in all aspects. In most of the cases, learning-by-doing (on-the-job) human capacity development is carried out, which is the other component of the national education system. This on-the-job human capacity development includes training, education, guidance, and practical activities outside the formal education. Ministry of Agriculture and Rural Affairs (MARA) provides these on-the-job human capacity development activities as supplementary training for its staff in areas needed to fill knowledge gaps.

In addition, MARA also conducts adult training activities through its provincial and district directorates, using a range of various methods that include provision of information to farmers through booklets, TV programmes, radio programs, and on-farm practical demonstrations.

Turkey has an extension system in place, coordinated by the Ministry of Agriculture and Rural Affairs (MARA). Despite the national and international effort and resources, the

performance of the Turkish national extension system is still unsatisfactory, partially owing to the lack of efficient coordination of universities, MARA directorates and research institutes, and the extension system (Ozcatalbas et al., 2004; Yavuz, 2004). In addition, farmers regard the knowledge as a public good, an approach that impedes the future development of the intellectual property rights system. Poor communication between research and extension services has hampered the dissemination of new technologies to farmers over several decades.

The structure of the extension system is rather formal. Village group technicians, the end point of the extension system structure and the closest agents to farmers, cover a group of 4-5 villages and live in the village. They address farmers' problems through the Farmers' Training Division that provides training to farmer (Güney et al., 1999). Extension activities follow a rigid schedule with little input from farmers, with the result that programmes tend to lack relevance to local farm problems. As well as structural and organisational weaknesses, the extension system has faced farmer reluctance to engage in extension activities because of limited access to credit. More positively, NGOs have recently started to provide extension services, and independent producers' associations and co-operatives have started participating in extension activities.

Agricultural knowledge and information system, adequate farm extension services, and improved linkages between farm and off-farm sector would facilitate the increasing capacity of the Turkish farming sector. Turkey faces a problem of changing the mindset of the farmer having limited or in some regions no resources, except for human capital. These small farms are not in search of knowledge either. However, there are initiatives, of private entities, such as Turkish Agricultural Producers Union, to undertake this role in some parts of the country. It is more likely that the public sector will be the main source of agricultural knowledge in near future.

EU regulation (EC) 1783/2003 requires member states offer farm advisory services to farmers. The Council may also require the compulsory participation of farmers to the advisory services in 2010 in order to be eligible to agricultural support schemes. It is clear that the latest CAP reform puts a priority on the agricultural extension. OECD (2004) indicated that a good extension system would contribute to Turkey's competitiveness by supporting farmers with advice on deciding the appropriate cropping pattern and new farming technologies.

Turkish government has prepared a law on public management. Within the de-centralisation programme, the law requires that the provincial and district agricultural directorates will not be linked to the central government which will only set the rules and control. This approach will further hinder the link between local extension agents and the research institutes, already criticised to be weak.

The chance of the extension system is the growing interest of the large holdings in the agriculture and contract farming. These holdings vertically integrate agriculture with the processing industry and provide knowledge to the producers. Unless the structure of agriculture and the income of farmers improve, and farmers become knowledge seekers, current extension system would be of little help to improve the performance of agriculture.

## **EVALUATION OF THE CHALLENGES RELATED TO CAP IMPLEMENTATION IN TURKEY AND POSSIBLE IMPLICATIONS**

### ***Agricultural Policies in Turkey***

Turkish agricultural policy has a long history of agricultural price intervention. Its roots go back to the early 1930s when the governments tried to alleviate the adverse effect of the Great Depression and later the Second World War. The objectives of the agricultural policy in Turkey are set by annual programs and development plans of the State Planning Organisation (SPO) and include: ensuring adequate levels of nutrition, raising production levels and yields, reducing the vulnerability of production to adverse weather conditions, raising levels of self-sufficiency, increasing agricultural incomes and improving income stability, increasing exports, and development of rural areas.

The Turkish government has implemented a variety of measures to fulfil these objectives. Domestic price support was extended by means of intervention purchases and supported with quantitative import controls and tariffs. Inputs including credit, research, extension and training services are funded by the state to support farm income. Regional programs are also developed and implemented to reduce regional disparities in income and technology. The government has taken active measures in pricing and marketing agricultural products and recently sought to establish regional commodity markets.

Several policies supported the Turkish livestock sector since 1923. Until 1959, the government support focused on animal disease control, veterinary service, and genetic improvement of native livestock breeds. The government intervened in market activities during the early 1950s and its intervention increased during the planned periods. Recent livestock sector policies include: import restriction (control of meat and meat products, dairy products, livestock and animal feed sources), veterinary services and animal disease control, subsidised heifer and lamb distribution to producers (both cultured and crossbred), artificial insemination applications, export subsidies, input price subsidies and agricultural credit support.

The single most critical issue in the agricultural sector was the inefficient and costly system of agricultural support policies. These have not only manifestly failed to enhance the productivity growth, but have been a heavy burden on consumers and taxpayers and a source of Turkey's macroeconomic problems. However, in the recent years, the overall support to agriculture in Turkey has been declining rapidly.

### ***Agricultural Reform Process***

The Government of Turkey (GOT) has embarked on a structural adjustment and stabilisation program of historical dimensions as part of the Turkish Economic Program. The GOT's strategic objectives supported by Agricultural Reform and Implementation Program (ARIP) focused on several elements. First, the Government phased out the unsustainable and distorting system of subsidies for fertilisers, credit and price supports which disproportionately benefit large farmers, regressively tax consumers, so that to link prices to world market prices. The second initiative under the program is to privatise most of the state enterprises in agriculture to reduce government involvement in the marketing and processing

of agricultural products. Third, the government will introduce a unified national program of direct income support. The reforms will assist the GOT in the accession to the EU by increasing the efficiency of the agricultural sector and the economy at large, thereby helping it to meet one of the most basic pre-conditions set down by the EU, namely that the applicant states have economies that are efficient enough to be competitive on the common market.

Administered prices - set and implemented by State Economic Enterprises (SEEs) - were abolished. Deficiency payments are implemented for oilseeds, mainly sunflower, soybeans, cotton, canola, maize, and olive oil. Tea growers are fully compensated for the costs incurred in implementing strict pruning requirements to control supply. Input subsidies are all eliminated. An annual Direct Income Support (DIS) payment to cushion the losses associated with the removal of administered prices and input subsidies is granted per hectare to all farmers. A one-off Farmer Transition payment is granted to cover the costs to divert from over-produced commodities (namely hazelnuts and tobacco) to other commodities.

Financial aid is granted to assist the restructuring and transformation of Agricultural Sales Cooperatives (ASC) and their unions (ASCU) into genuine co-operative organisations, i.e. independent, financially autonomous and self-managed co-operatives that sell and process the agricultural production of their members. Government agencies (SEEs) and Agricultural Sales Cooperatives Unions (ASCUs), previously responsible for purchasing on behalf of the Government, announce their purchasing prices, independent of the government influence.

### ***Agriculture Policy Paper – 2006-2010***

As part of the Economic Program, ARIP has been implemented since 2001. Strategic objectives, principles, and priorities of agricultural policies to be implemented after the ARIP are set forth in the agricultural policy paper 2006-2010. The objective of this paper is to help decision-making to develop the sector in accordance with the development plans and strategies, taking into account the EU integration.

The following principles are set in the designing and implementing the future agricultural policies: holistic approach, taking into account of the international agreements, providing support without distorting the market prices, improving organisation and strengthening institutional capacity and private sector role, considering health issues, adapting environmentally friendly agricultural practices, decentralisation in the decision-making and implementation, participatory approach, science oriented approach, promoting young farmers.

### ***Agricultural Support Instruments***

The tools of agricultural support to be used until 2010 are Direct Income Support (DIS) Payments, Deficiency Payments, Compensatory Payments (Farmer Transition), Livestock Support (fodder crops, artificial insemination, breeder incentive, milk premium, risk-free livestock region, bee-keeping, fisheries), Crop Insurance Support, Rural Development Support, Environmental set-aside (CATAK). In addition, funds will be allocated to selected credit supports and research and development aids within a competitive grants scheme. Due to the importance of the sector and its multifunctional nature, attention will be given to ensure that the funds allocated for agricultural support will not be less than 1% of GNP.

## ***CAP implications***

Turkey will adapt the EU agricultural policy acquis over the period 2005-2015. The CAP policy instruments broadly include single farm payment, cross compliance measures, and rural development measures. On its side, the Turkish agricultural policy already incorporates a direct income support (DIS) system consisting of a flat rate payment per hectare. DIS system has some consequences for the Turkish agricultural sector. Since more than 80 % of the farms receiving DIS are small in size, those farmers do not intend or endeavour to earn a higher income from agriculture, except those involved in intensive farming. Aydoguş (1999) and Gencler and Artukoglu (2003) indicate that farmers having more land above the payment limit divided the land among their relatives in order to benefit from payments for all of the land owned. For this reason, the number of enterprises performing actual production is not precisely known. From this point of view, DIS did not contribute to agricultural development, and overall, DIS may hinder agricultural development. However, Turkey issued a policy paper for 2006-2010 where the share of DIS would be reduced to below 50 % of the total support. More emphasis will be given to other no trade distorting support measures (see section on Agricultural Policy Paper: 2006-2010).

There are currently no cross-compliance rules in Turkey, and they will have to be accepted under CAP. A significant part of the agricultural acquis concerns sanitary and phyto-sanitary measures, animal welfare, hygiene standards and food safety. Turkey has already made a good start with passing the necessary legislation. However, there may stand several issues in the implementation of the regulation (Oksam *et al.*, 2004). The creation of an infrastructure to manage the acquis is a longer and difficult process. More difficult is the fact that the sector is highly fragmented, substantial share of output is disposed of through informal markets or by auto-consumption. Therefore, effective communication of the SPS acquis to producers, as well as monitoring and control of all regulations will be a difficult and daunting task.

In addition, Turkey has to strengthen the existing programmes for disease eradication and control. Turkey also has to adopt strong and proactive programmes where necessary. These programmes have to be implemented with increased border controls for illegal animal movements. Turkey will seek technical and/or financial support from the EU to strengthen these programmes and border control which would be beneficial to the producers. Otherwise, adapting the acquis would make farming more difficult in such a production environment and most of the farms will go out of business. Only semi-subsistence farms may continue to produce but establishing the communication with them is more difficult given that they have nearly no commercial concerns.

Although Turkey will adopt a Conservation Reserve Program (CATAK) for 2006-2010 period, the current alignment with the environmental acquis is limited. CATAK is designed to provide compensatory payments to farmers in areas facing environmental degradation in order to shift to permanent crops. Payments will be made based on long term contracts. Farmers in Turkey would not experience a negative effect of the environmental acquis since the use of agri-environmental indicators at EU standards will help to benchmark for Turkey. In addition, agro-chemical use in Turkish agriculture is below the world average, and the environmental damage is not substantial. In other words, the levels of environmental degradation are low compared to developed countries. Monitoring and evaluation will most probably be the most difficult issues to be addressed by the authorities.

The retail and food processing industry will require safe and high quality food from the farming sector. This may push many small farms out of the market since it will be hard for them to comply with those requirements (Berdegue *et al.*, 2003). Small farmers can not make the necessary investment due to insufficient own resources and the problems faced in accessing external credits. In addition, large transaction costs make it difficult for retailers to deal with many small farmers rather than with a few large suppliers, especially in the case of unprocessed and perishable products. Small and medium farms can have a future in modern retail chain provided that they form a union and have access to input and output markets, and they enhance quality and quantity of their output. Consequently, Turkey has passed legislation on farmers union as an alternative marketing structure to increase the bargaining power of the small farms with agribusiness companies and to reduce transaction costs.

EU membership would imply that the position of Turkey on international trade issues to become closely aligned with that of the EU. This means that while remaining an individual WTO member Turkey will no longer negotiate independently in WTO multilateral negotiations its import and export regimes. In addition, Turkey is required to implement all the EU measures for goods that cross its frontiers. Developing the infrastructure, strengthening the administrative capacity and commitment for effective border control will be challenging elements in Turkey's adoption of the *acquis* (Oksam et al, 2004).

Turkey's current trade situation can be expected to change when it will become a full member. The country will adopt the common external tariff of the EU for every agricultural product. Turkey's current tariff bindings are higher in some areas than those of the EU. If the Doha Round Agreement imposes smaller tariff cuts on developing countries than on developed countries, average tariff bindings for the EU will be reduced by more than those of Turkey. Therefore Turkey may have higher bindings than EU common external tariff (CET) bindings for more individual products than presently. Thus, the tariff gap between Turkey and the EU could actually increase in the period prior to trade harmonisation. This means that, if agricultural trade between the EU and Turkey is harmonised in 2015, the fall in the maximum allowed tariff protection for these more highly protected products in Turkey will be relatively greater than it appears today. However, actual prices will fall only to the extent that Turkey's applied tariffs are higher than the EU's applied CET tariffs and fully determine the price gap between domestic and world market prices.

Cakmak (2004) indicates that the net export will be affected with the EU accession. Trade liberalisation with EU will enhance the imports compared to exports, especially in livestock products. Turkey could still be a significant net exporter in agricultural production. With no trade restriction with EU, livestock import will increase considerably.

The performance of the crop production is relatively better with the EU membership although individual crops display different responses. Wheat and corn production will decline, while barley and rice production will expand. Industrial crops will most probably remain competitive, and their production would expand. Oil seeds will show the highest production decline, while fruits and vegetables production will increase. Livestock production will decline more since the largest price falls following trade harmonisation will be experienced in the livestock sector (Cakmak, 2004). The results of the model developed by Grethe (2004) also points out similar developments in the aggregate.

Full liberalisation reduces income inequality among farmers, as large and wealthy farmers receive most of the gains in producer surplus resulting from current price support. On the

other hand, liberalisation leads to a more equal distribution of real income due to lower food prices. Bearing in mind that producers are mostly located in rural areas, their deteriorating economic situation, together with consumers' welfare gains, can be interpreted as an income transfer from rural to urban areas.

With EU membership, agricultural producers lose but food consumers gain. This implies an income transfer from rural to urban areas. This sentence already appears above. Within producer and consumer groups, membership reduces income inequality when trade is completely liberalised. With membership, the degree of producer protection and the general price level decrease, while imports of cheap livestock products increase, which in turn increases consumers' welfare.

Fruit and vegetables remain competitive but cereals and livestock products are uncompetitive. Turkey appears to be a net exporter of fruits and vegetables and a net importer of cereals and processed products, mostly animal products. Turkey also remains a net exporter of plant products as a total, including fruits, vegetables, cereals and other crops. Cakmak (2004) and Grether (2004) show that with EU membership the volume and value of the production of cereals decline, while those of vegetables, fruits and nuts rise. The authors further report large imports of livestock products.

Farmers in the northeast and the Black Sea regions suffer the highest loss in producer surplus because of the high share of sugar in the northeast and tea in the Black Sea region. Farmers in the Aegean, Mediterranean, and Southeast regions, however, experience the smallest loss because of their high share of fruit, vegetables and cotton, products which still remain competitive. For animal producers, absolute welfare loss is more equally distributed among regions.

South-eastern Anatolia Project (GAP) region would benefit the most from EU membership since the positive effects of an expansion of irrigated land are relatively easily captured with membership. It is the only region that enjoys an increase of the agricultural production value. In the case of membership with area compensation payments, almost all payments are allocated to the Central Anatolia region, which is predicted to experience a 9 % fall in revenues following the accession. (See Oksam et al., 2004 for a summary of the literature on Turkey's Accession to EU).

Rural development policy aims at increasing the productivity of rural areas, regions, or industries. This can be done by targeting policy instruments such as education, research, extension to increase productivity or by policies to support the reallocation the production factors such as labour and capital. Often policies contain both elements: increasing productivity and the reallocation or increase of input use (Oksam et al., 2004).

Rural development policy in Turkey is in several aspects quite different from that of the EU. Turkey's rural development policy in the past has shown more similarity with EU structural policy, where large infrastructural projects are sometimes used to stimulate the development of a region. Rural policies in Turkey are production oriented and also focus on the basic infrastructure. EU Rural Policy, second pillar of the CAP built around three thematic axis is intended to improve (1) the competitive position of agriculture, (2) the environment in relation to agriculture, and (3) the living conditions in local communities (EU, 2004). The EU rural policy has a strong bias towards agriculture since the funding of rural policy comes from the agriculture budget. Likewise, the Turkish policy paper: 2006-2010 includes the rural

development with 10 % share of total agricultural support payments. With the policy paper, the rural development approach becomes more in line with that of the EU.

The competitiveness objective (Axis 1) is to improve the economic performance of agriculture by reducing production costs, increasing the economic size of the farms, promoting innovation and more market orientation. Broad measures are support to human resources, physical capital, and the quality of agricultural produce. The challenges of Turkish agriculture with regards to harmonisation with that of EU lie in this axis. Problems in Turkish agriculture are related to the production factors: illiterate and unqualified human resources, insufficient capital, and abundant but unproductive land. Implementing the EU rural development policy in Turkey would increase the size of the holdings and reduce the number of agricultural employees. These effects then lead toward a higher quality of production, more integrated with the industry and the market.

Axis 2 aims at ensuring the delivery of environmental services by agri-environment measures in rural areas, and supporting land management. The measures in this axis refer to the sustainable use of agricultural and forestry land. This axis particularly aims at the less favoured areas (LFAs) Turkey also is at disadvantage where soil quality is low, areas are generally mountainous and difficult for agricultural activities. Turkey has implemented various measures to improve the economic situation and living standards of villages in forested areas. Setting up necessary institutions would be an important further task.

The objective of the wider rural economy axis (Axis 3) is to have a living countryside and to help maintain and improve the social and economic fabric. Measures under this axis target the quality of life and economic diversification. Axis two and three are expected to reduce the pressure on the agricultural land. This would increase the overall productivity, reduce the dependency on agricultural income, and integrate agriculture with food industry. Agricultural producers' perception will also change in that they would consider agriculture not just a way of living but as a business activity. Investment can increase as well.

Turkey has implemented several rural development projects. These projects are typical examples of integrated rural approaches concentrating on electricity, communication facilities, roads, health, education, agriculture, and human development. The approach is top-down, and local capacity is not incorporated. There is no experience in Turkey with projects similar to LEADER, where a bottom-up process generates initiatives and stimulates the search for co-financing. However, the Union of Turkish Agricultural Producers with the help of German Farmers Union, has carried out a "leader farmer" project in seven location in Turkey. The purpose of the project was to establish a producer-managed organisation to provide farmers with information needed for agricultural production and to train farmers in using various technologies. The organisation would also employ a agricultural consultant on a contract base. Experiences showed that such organisations are not sustainable in countries like Turkey, unless a strong financial support combined with a good management is provided.

Turkey initiated the Village Based Participatory Investment Program (VBPIP) supported by the World Bank within the ARIP with the objective to increase the rural income, raise social standards of the rural population, rehabilitate infrastructure by conserving their natural resources, increase productivity in agriculture in line with sustainability agenda and strengthen food security by taking into account the preservation of natural resources.

The pilot program concentrated on the areas of maize drying and storage, collection, cooling and processing of milk, storage, processing and packing fruits and vegetables, construction greenhouses construction using alternative sources of energy (geothermal, solar, wind, etc.), meat processing, food legumes processing and packing, and bee products processing and packing.

Turkish rural development strategy paper, in line with EU rural development program, has been prepared. Its aim is to increase the capacity in rural development projects and implement projects to be funded by IPARD in Turkey. In the pre-accession period, Turkey will also establish a paying agency and a rural development agency. This initiative would strengthen the farming community and increase specialisation via increased relationship between the institutions and producers.

## **CONCLUSION AND FUTURE RESEARCH AGENDA**

Turkish agriculture is characterised by a dual structure: traditional vs. modern. Regional differences in the use of agricultural technology (land, labour, and capital saving technology) are also a distinct characteristic of the Turkish agriculture. Implications or impact of the CAP therefore may also differ both across regions and types of the farming. Studies indicate that the red meat sector, the most vulnerable sector, would suffer more from the market integration, followed by the cereals sector. The dual structure of the Turkish agriculture would in fact be sustainable. Traditional farms, not exhibiting economies of scale and relatively labour-intensive, continue to produce for their consumption and market the surplus production without serious price concerns. Modern farms have productivity and cost advantages, and therefore continue production with reduced capacity. The overall impact of the EU integration and CAP would be positive.

On the other hand, no miracle should be expected unless the agricultural sector is re-structured, ownership is settled, land consolidation is completed, and most of the farms are transformed into commercial businesses. Most importantly, the institutional arrangements are put in place. Turkey faces such a task in agriculture prior to EU integration. The EU contribution to Turkish agriculture would then make a difference.

There is a large list of literature on the impact of CAP on national agricultural sectors and the cost of the CAP to EU in new member states (NMS) and candidate countries (CC). Yet, there is a large area of study on crop specific and farm level impact of the CAP in Turkey. Therefore, models incorporating the farm level data can be generated. Country cases and experiences will help better understanding the situation better, and allow taking action for the benefit of both CC and EU.

### **Note**

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Title: Sustainability of the Farming Systems: Global Issues, Modelling Approaches and Policy Implications

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**Abstract**

The interest related to agricultural sustainability in general, and farming systems in particular, gained recently in importance on the research agenda of the Institute for Prospective Technological Studies of the Directorate-General Joint Research Centre of the European Commission. Within the series of activities related to positioning the Institute with respect to this topic, two expert workshops were organised in 2004 and 2005. This report brings together the contributed papers the speakers to the two workshops were invited to submit in support of their oral presentation. The papers reflect the opinions of the corresponding authors and do not represent the official position of the European Commission.



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