

# **Diversification and multifunctionality in Italy and the Netherlands: a comparative analysis**

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**Abstract:** Diversification and multifunctionality represent two important adaptation strategies recently adopted by EU farmers to react to the crisis of the so called agricultural productivist model. During the last decades these strategies have been strongly encouraged by the CAP, since they are identified as means to create additional farm income and enhance the quality of life in rural areas, hence to retain farmers in business, attract new entrants to agriculture and, more broadly, promoting rural development.

In this work we focus on the operational classification proposed by Van der Ploeg and Roep (2003) that define the move towards multifunctionality and diversification in terms of broadening, deepening and regrounding.

Using the Dutch and Italian FADN data as a source of information, we compare the diffusion of broadening, deepening and regrounding strategies and explore the farm and farmer characteristics associated with them in two different EU socio-economic and agricultural environments: Italy and the Netherlands. Results have shown that farmers in both countries widely rely on the targeted strategies, but even that diffusion patterns differ, partly due to the available information.

**Keywords:** multifunctionality, diversification, agri-food sector.

## **1. Introduction**

The product mix of farms these days is much wider than just food and fibres. Farms have traditionally tried to cope with the problem of chronic low agricultural income, by devoting part of the resources available on the farm to off- or on-farm more profitable

activities. For example, the participation of some of the members of the farm household to off-farm labour market or the activation of direct selling or on-farm processing.

More recently, the adjustment process that farm businesses can activate to react to the price cost squeeze that is afflicting the agricultural sector has become more complex.

Farms are progressively shifting their resources from the production of traditional crops and livestock products to that of new products with higher profits, such as agritourism, quality products, educational and social services. In addition, the new support in favour of rural development and diversification have opened new opportunities for investments in non-commodity outputs.

The concept of multifunctionality in agriculture began to take shape in 1992, during the Earth Summit in Rio, in a historic phase involving profound changes in the position of the primary sector in the world economy, and the approach to relative support policies (Van Huylenbroeck *et al.*, 2007). In Europe, the concept was legitimised with the debate regarding Agenda 2000, mainly as a defence of the EU's position in WTO negotiations. In fact, multifunctionality was presented in that context as a specific element of the European agricultural model, which gave legitimacy to public funding no longer linked to product quantity, but to the provision of services together with agricultural products in the strict sense. At the same time, the OECD, in the late '90s and early years of the new decade, undertook a systematic definition of the concept of multifunctionality and an analysis of various countries' positions about the use of the term, and its political valence internationally (OECD, 1998, 2001, 2005).

Since that time, the term has entered the common language of those involved in various guises in agriculture and rural development, and has acquired different definitions depending on the context.

The literature refers to agricultural multifunctionality, in its broadest accepted meaning, according to four types of function: following the Van Huylenbroeck *et al.* (2007) categories, these can be grouped as follows: "green" functions (landscape and biodiversity management); "blue" functions (water resource management and flood control); "yellow" functions (vitality of rural areas, historical and cultural heritage, rural amenities); and "white" functions (food security and safety).

OECD provides an operating definition of multifunctionality, referring to the primary sector's capacity to produce agricultural commodities, coupled – in a certain measure inevitably – with "non-commodity outputs". In particular, according to the OECD, the key elements for defining multifunctionality are: 1) the existence of multiple commodity and non-commodity outputs produced jointly by agriculture; and 2) the fact that some of the non-commodity outputs feature the characteristics of externalities or public goods, with the result that markets for these goods do not exist or function poorly.

The aim of this paper is to provide a quantification of the importance of diversification and multifunctionality at the farm level in two EU countries. To do this we apply the operational classification recently proposed by Van der Ploeg and Roep (2003) in terms of *broadening*, *deepening* and *regrounding*, later defined in detail. The analysis is intended not only to compare the diversification pathways followed by the two countries, but even to highlight the revision needed to adapt farm surveys such as FADN, originally designed to monitor a productivist agriculture, to the complex post-productivist reality of farm businesses in these days.

## **2. Multifunctionality, diversification and pluriactivity**

## 2.1 Some definitions

Before analysing the evolution of multifunctionality, it is useful to clarify the distinction between this concept and those of diversification and pluriactivity. In fact, though the literature often uses these three terms as synonyms, partly because of the many ways their definitions overlap, they refer nonetheless to distinct phenomena, summed up as follows and as discussed in the following pages.

**Table 1: Definition of the phenomenon**

Concept	Unit of analysis	Definition
Multifunctionality	Agriculture / Farm	Use of the farm's resources for agricultural production and non-market outputs (e.g. landscape, organic products, quality products, on-site conservation of bio-diversity, etc.)
Diversification	Rural business (agricultural and non-)	Use of the business' resources for agricultural and non-agricultural production (e.g. photovoltaic energy, rural tourism, etc.)
Pluriactivity	Family household	Use of family resources on or off the farm.

In this paper, the concept of multifunctionality originates from the OECD definition of the (jointly produced) public goods. This definition and the categories labelled by Van Huylenbroeck (2007) suggest that multifunctionality is a characteristic of the agricultural system in a certain rural area or region, and not necessarily of an individual farm. This is most clear in public goods like landscape, which are defined on the level of (certain parts of) Tuscany or the Beemster (a Dutch polder on the Unesco Heritage list).

There is more than pure private and pure public goods. Table 2 uses the concepts of non-rivalry and exclusion to show that there are two intermediate forms. Common goods where rivalry exists but exclusion is not possible; common fish grounds or water systems are classic examples. And quasi-public goods, where exclusion is possible, but rivalry does not exist. Landscape is a classic one: persons can be asked a fee to enter a region, but as long as the area is not overcrowded, the visit of one person does not reduce the possibilities of another to experience the landscape.

**Table 2: A typology of goods**

	Non-rivalry goods and services (indivisible)	Rivalry goods and services (divisible)
Impossibility of exclusion or rejection	<b>(1) Pure public goods</b> open space / rest / biodiversity / natural habitat / cultural heritage	<b>(2) Common goods</b> ground and surface water / fish in the ocean, rivers and

		canals / wildlife
Possibility of exclusion or rejection	<b>(3) Quasi public goods</b>  nature / landscape	<b>(4) Pure individual goods</b>  agricultural products / agricultural tourism / health care farms

Source: Salverda et al, based on Van Huylenbroeck and Slangen (2003)

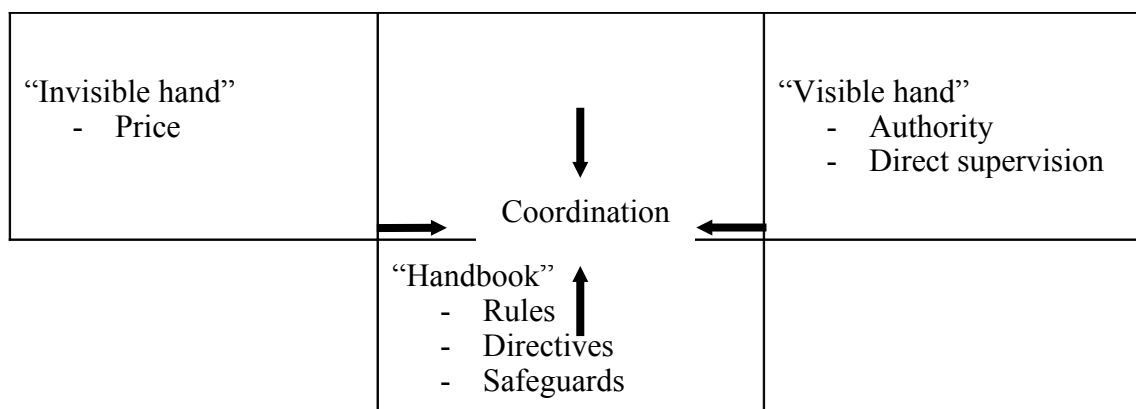
The four types of goods as described in table 2 suggest that there are possibilities for governments to ensure the production of public goods by private parties such as farmers. This is the case for public goods, where governments can hand out contracts or pay subsidies to promote the provision of such goods. But it is even more the case with common goods and quasi public goods where also producers themselves have options to organise themselves. Slangen (2008) for instance suggests on basis of the club theory that cooperatives can play a role in landscape provision. A nature or landscape cooperative can reduce transaction costs in a contract with the government and can improve the blending of pure individual goods (e.g. milk production) with quasi-public goods (e.g. access to land for hikers or cows in the meadow) at a regional level. Such farm groups might also create common goods (from web sites to joint facilities) that help them to reap the benefits of multifunctionality.

The coordination mechanisms available can also be classified in four types (figure 1): the invisible hand for the market, the visible hand within a hierarchy, the handshake (trust, shared mission and objectives), and the handbook (the contract with detailed instructions). In reality institutional arrangements are often a combination of the coordination mechanisms: also a contract asks for some common values (in contract handling for instance and contracts are per definition incomplete). The message here is that the different coordination mechanisms provide incentives to preserve or enhance the multifunctionality aspect of agriculture.

In cases where this is done, multifunctionality becomes observable at the farm level and is reflected in farm accounts. As we will show in this paper, this makes it also possible to provide data on the level of engagement of farms in multifunctionality at the level of a region. It should be noted however that this does not measure the multifunctionality of a region: that can be much higher, especially if the visible hand is the coordination mechanism for public goods (meaning that this is done by the government itself) and that the handshake (common values and norms on farming) guarantees common goods, without much payments or contracts.

**Figure 1:** 4 types of coordination mechanisms

<p>“Handshake”</p> <ul style="list-style-type: none"> <li>- Mutual adjustment</li> <li>- Reciprocity</li> <li>- Common values and norms</li> </ul>
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Source: Salverda et al, 2009, based on Borgen and Hegrenes (2005)

### 2.2 Information for decision making

To coordinate decision making in multifunctionality, farmers need incentives. In particular, let us use the hypothesis that farmers decide whether to use their available resources for monofunctional production – with the sole objective of agricultural production – or for multifunctional production, with more than one product jointly, some of which have externality characteristics. In the first case, production activity can lead incidentally to creating some externalities (environmental or socio-economic), but in amounts not planned and controlled by the farmer, since potential associated costs and benefits are not included in the set of values considered in farm decision-making. In the second case, farmers become multifunctional, since they recognise potential economies of scope<sup>1</sup> in joint production of two or more products, or because they can see economic value<sup>2</sup> in possible non-market output produced jointly with agricultural products, a value used in deciding how to maximise the farm’s private benefits. Recognition of the economic value of externalities produced by multifunctional agriculture may occur, for example, following awareness campaigns showing how market rewards quality and environmental characteristics of products (organic, integrated agriculture, traditional or local products), compared to the price of conventional products; or with the granting of public support designed to optimise production of externalities (as with agri-environmental measures). Whatever the process is of identifying and measuring the economic benefit associated with multifunctional production, farmers may use this information to allocate farm resources efficiently, to create a combination of agricultural and non-agricultural products that will maximise private benefit, and at the same time guarantee an adequate supply of public goods.

Thus, multifunctionality can be a rational economic choice, not necessarily guided by sensitivity for the natural environment or other non-economic considerations. Farmers’ sensitivity to nature conservation or local cultural heritage may be a stimulus factor for adopting multifunctional practices, but it is not in itself sufficient to justify choosing multifunctionality, and especially cannot guarantee the economic sustainability of that choice over time. To successfully produce and sell an organic product, or a local

<sup>1</sup> When joint production of two or more products it becomes more economical than producing them separately, this is economy of scope.

<sup>2</sup> This value can be approximated, for example, from the price differential obtained for a quality or organic product, or from official financial support received for conserving the rural landscape or biodiversity.

traditional product or a service, as happens with social agriculture<sup>3</sup>, farmers must be prepared to take the risk of often very specific investments that are consequently difficult to reverse (*non-recoverable costs*). Moreover, they must know how to move in a complex, little known (niche) market and often distant from potential customers. All this implies certification and advertising costs, but also real *transaction costs* associated with looking for sales and communication channels with potential customers. In other words, multifunctionality involves a very complex cost-benefit analysis, for farmers to be able to identify and measure the economic value of potential external and indirect benefits, as well as various kinds of costs that may arise from choosing multifunctionality.

These considerations clearly show that choosing multifunctionality is not to be viewed solely as a strategy for survival, the exclusive prerogative of marginal, small or residential farms. Indeed, when a farm identifies the economic value of the benefits of multifunctionality, and internalises them in the production planning process, the adoption of MPs (multifunctional practices) becomes part of a series of competitive strategy options for any type or size of farm.

### 2.3 Diversification and pluriactivity

The concept of *diversification* also refers to the farm as a unit of analysis, but here the unit may gradually depart from its original “agricultural” nature, toward non-agricultural but rural activity. In the extreme, this unit of analysis may lose all agricultural connotations and be identified because of its territorial location as “rural”. In other words, a business with land as a resource, as well as labour and capital, which *also* makes it suitable for agricultural production. In any case, land and other resources may be used to produce non-agricultural goods and services, such as rural tourism or energy production (photovoltaic and wind-powered for example) or conservation of the environment and natural resources<sup>4</sup>. In this case as well, sensible farmers will base their decision on the combination of agricultural and non-agricultural products, to maximise their private benefits. The optimum combination, and then the degree of diversification and eventual specialisation, are derived from the ratio between the prices of producible goods, given the existing combination of resources and technology<sup>5</sup>.

The polar cases of specialisation are represented on one hand by a multi or monofunctional farm (all resources dedicated exclusively to crops and livestock, and possible externalities obtained jointly) and on the other by a farm devoted to non-agricultural products (total de-activation of agricultural function). In fact, diversification can be interpreted as broadening the range of production possibilities of a business that was originally agricultural.

Finally, the concept of *pluriactivity* is different from the two preceding concepts, in that the unit of analysis is no longer the farm but the farmer’s family or household (Saraceno, 1985). Pluriactivity refers to cases where, after evaluating the advantages of

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<sup>3</sup> Social agriculture refers to a primary activity designed to provide social services, like training, therapy and education (see, for example, Pascale (2005) and Senni (2007)).

<sup>4</sup> In this case, the environmental function replaces the agricultural, unlike multifunctionality where nature conservation occurs jointly with production of market outputs. In the first case, for example, think of a wildlife farm or nature reserve (private). Multifunctional farms are those that produce agricultural varieties in danger of extinction.

<sup>5</sup> Or of the economic value in the case of production of non-market goods, as in the case of a private nature reserve subsidised by the public sector.

family labour inside and outside the business, one or more family members (thus part of the family's available labour resource, but not necessarily of the farm or rural business) work outside the business (in agricultural or non-agricultural activities, as dependent or independent workers). The choice to work off the farm may be interpreted, as shown by household models, as the result of a maximisation process of family income – given as the sum of on farm and off farm family income produced by a family.

### **3. Broadening, deepening and regrounding**

According to Van der Ploeg and Roep (2003), the process of farm transformation moves along 3 distinct trends: a *deepening* of agricultural production, a *broadening* of functions activated by farms and a *regrounding* of farm processes.

In the first case, farms differentiate their productive potential by moving toward agricultural goods with unconventional characteristics (organic products, quality products, typical products, etc.), or by moving along the supply chain, acquiring functions down the line from production (direct sales, etc.).

Broadening involves a process of expanding income-producing activities, some of which can also be completely independent of real agricultural production, by exploiting entrepreneurial activities in a rural context wider than strictly agricultural (rural tourism, landscape management, therapy farms, as well as new organisational forms with services managed by persons other than the farmer or agricultural entrepreneur)<sup>6</sup>.

Regrounding refers to those cases in which some production factors, labour in particular, are devoted to activities outside the farm. The regrounding category contains pluriactivity and those cases which the anglo-saxon literature refers to as *economical farming*, that are those cases in which production costs are reduced, hence the autonomy of the farm is increased, by replacing internal to external inputs. Working outside the farm and reducing production costs have in common that the inputs in the farm activity are reduced.

A strong trend towards deepening of primary activities lead to a farm that differentiates its product by favouring, directly and indirectly, production of positive externalities. A strong process of broadening produces externalities, but leads to a kind of farm that may also gradually reduce or eliminate its original primary activity entirely. In this sense, broadening may lead to a diversification of the agricultural sector. Regrounding refers to a reallocation of production factors within the farm, but its main analysis unit, at least for pluriactivity, is not the farm in itself, rather the family. However, regrounding affects also the multifunctional activity of farms: on one side pluriactivity implies less time to devote to other practices (because family members are involved in other non-agricultural, sometimes non-rural activities); on the other hand, the proximity of pluriactive farms with urban centres give farms the possibility of specialising in services demanded by citizens and increasingly supplied by farms (such as recreational services, therapy services, didactic services, and so on). Given this picture, in reality what happens more frequently on farms is a combination of deepening, broadening and regrounding, which identifies various levels of multifunctionality.

Based on the different combination of deepening and broadening, EU Member States have been classified according to how farm income changes (Van der Ploeg and Roep,

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<sup>6</sup> In this regard, see also the work of Oostindie, Renting (2005), part of the Multagri research project (6th Framework Research Programme of the European Commission).

2003): in Italy, for example, it is estimated that around 8% of value added comes from deepening and broadening, while in Germany this figure is over 15%, and in Spain less than 5%. With reference to the percentage of farms involved, in Italy over 30% of farmers engage in deepening, and roughly 6% in broadening, whereas in Ireland the situation is reversed, with 33% of farmers oriented toward broadening and less than 5% toward deepening.

## **4. Multifunctional and diversification practices in Italy and the Netherlands**

### *4.1 Main features of Italian agriculture*

Italian geography is characterized by the prevalence of hilly and mountainous areas: out of a total land area of 30 million hectares, only 23% is made up of plains. UAA accounts for 12.6 million hectares, around 71% of the TAA and around 42% of the total surface.

#### *4.1.1 Structural and economic aspects of Italian farms*

In Italy in 2005 there are 1,706,773 farms, with an average UAA around 7.4 hectares, generating a total gross margin (SGM) of around 22 million European Size Units (ESU). The ratio between total SGM and number of farms generates an ESU in average of 12.77. Out of the total units, 86% are specialized farms. 48.9% of the national total are represented by permanent crops, followed by 25.5% of arable crops and by 9.3% of herbivorous livestock. Specialized farms are widespread in all Italian regions: the highest percentage is found in Trentino Alto Adige (95.5%) in the North of Italy, followed by Puglia (94%), in the South of Italy, while the the lowest percentage is found in Umbria (Centre of Italy), with 71.4%.

Farms employ around 1.2 million of working units (AWU), with a strong prevalence of family work (84.9%), reflecting the fact that most of farms are individual and counting on family work. 11.3% is represented by short-term contracts, linked to seasonal needs, while 3.5% only is represented by permanent contracts. This aspect highlights the high flexibility in employment in the agricultural sector.

Looking at the relationship between land use to the farm size (ESU), note that arable crops predominate irrespective of economic size; the two less profitable farm sizes (less than 4 ESU and between 4 and 16) are specialised in permanent crops, while the most profitable category (16 and over) is specialised in permanent grasslands and pastures. Comparing data on farm size in the period 2000-2005, they register a steady increase in all geographical macro-regions, even if differences are still stand among North (10.1 ha), Centre (8.3 ha) and South (5.8 ha).

Another interesting link is that between the economic size and the age of farmers. It seems confirmed that older farmers run less profitable farms. Farms less than 4 ESU sum up only to 27.3% of farms operated by farmers between the age of 16 and 24, with the highest concentration falling in the category of 65 years and over; on the contrary, younger farmers are concentrated in larger farms, from 16 ESU and over.

In terms of agricultural output, data available for 2006 underline that the sectors with the highest share of the total are livestock, field crops and tree crops, with values



ranging between 13 and 14 million euro. More in details, meat represents 20% of total output, vegetables 16%, milk 9.7% and fruit and citrus 9%.

Among main vegetable and fruit output, the first four main products in value (between 2,000 and 1,000 million euro) are: olive oil, wine, hybrid maize and tomatoes.

#### *4.1.2 Multifunctionality in Italian Farms*

10.7% of total farms produces for its own consumption; on the contrary, multifunctional farms, as recorded by the official statistics, are relevant in terms of units (10.3%), AWU (17.7%), output (25.4%) and value added (23.8%)<sup>7</sup>. Multifunctional farms are more widespread in the South (around 41%), with a small or medium ESU and in general with one extra-agricultural activity. There is a direct proportion between the degree of multifunctionality (in terms of number of additional activities) and the size. The most representative activities are on-farm vegetal and animal product processing and agritourism.

The picture emerging from data suggests that Italian agriculture is mainly characterised by small size specialized farms, directly managed by individual farmers, most of them over 65 years, with the support of the family, and temporarily supported by extra-family seasonal workers. Land is mainly devoted to permanent crops, wine, olive, fruit, high productive crops, thus identifying the traditional Mediterranean production, however the small size of farms hardly allows to reach profitable results. Exception to this pattern is identified by large farms with permanent grasslands and pastures, managed by young farmers. Moreover, Italian agriculture has a significant percentage of multifunctional farms, where other related activities are developed. Likely due to the richness of the territory in terms of natural resources, landscape and history, traditional agricultural activity strongly and easily succeed in connecting products and food to tourism, sport activities, farmer markets, and other diversification activities.

#### *4.2 Main features of Dutch agriculture*

The Netherlands is a relatively small country with a high density of population (even above 400 persons per square kilometre). The geographic conditions, along the sea with big ports for transports worldwide and some rivers for transports into Europe, are a stimulus for international trade. Natural conditions – a mild climate, fertile soils in a flat landscape and the availability of water – are important positive factors for a variety of agricultural activities. The combination of these two (geographic and natural) factors, amongst others, results in an intensive agricultural production sector.

The geography of the Netherlands is characterized by the prevalence of flat areas. A large part of the land is even below sea level. UAA accounts for 1.9 million hectares, around 50% of the TAA (including water) and around 60% of the total country surface.

##### *4.2.1 Structure of the farm sector*

Agriculture (including horticulture) in the Netherlands consists of some 80,000 farms with some 200,000 persons working on it. Most of the farms are family farms; this

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<sup>7</sup> Multifunctional farms in statistical data collected are those with activities different from agriculture and cattle, but related to the sector and employing farm resources or products. These activities refer to agritourism, handicraft, on farm processing of vegetal and animal products, renewable energy production, contracts work.

means that the farmer and his family own the farm and do most of the work. A relative small part of all farms, most the holdings in horticulture, have (non family) salaried persons.

The UAA is on average nearly 25 hectares per farm. Farms together generate a total gross margin (SGM) of around 7 million European Size Units (ESU). The average size of farms is around 85 ESU. About 88% of the farms are specialized farms.

To achieve an acceptable income on the restricted surface farmers and breeders have specialized and intensified their production during the last decades. This process of specialization and intensification was necessary moreover because of the high prices and costs of land and labour. In this process farmers have been inclined to invest in increasing the scale of production and bringing downward the costs of production. Farms and holdings specialized on products with a minimum of land to be used in the production process became more important in the Dutch agro-sector during the last decades. This means for instance that:

- The production of pigs, poultry meat (broilers) and eggs is mainly concentrated on the around 6.000 specialized farms. These farms have a small surface of land (average some 6 hectares). These livestock farmers mainly use compound feeds (with cereals and other ingredients) as well as byproducts of the food industries as feed.
- The production of (most) vegetables, flowers and ornamental plants is located on around 6,000 holdings (average 1.5 - 2 hectare) with “greenhouse”, which are warmed with the use of mainly natural gas.
- The around 8,000 horticulture holdings with “open field crops” (e.g. vegetables, fruits, flower bulbs and nursery plants) have with on average some 15 hectares of land also an intensive way of production.
- The around 20,000 dairy farmers (average around 40 ha and 65 dairy cows per farm) are rather intensive in their production with a production level above 10,000 kg per hectare. They also make use of compound feeds and byproducts. They use these products in combination with feeding stuffs (grass, silage of green maize etc.) produced on their own land to achieve a high level of milk production per cow (around 8,000 kg).
- Besides the specialized dairy farmers some 20,000 other grazing livestock farms, mainly with beef cattle, young cattle, sheep, goats and horses, are active.
- The around 12,000 specialized arable farmers (average around 40 ha) are for a large part specialized on “high value crops” as for instance ware and seed potatoes, vegetables and sugar beet. On most of these farms the use of land for “extensive, low value” crops as cereals and oils seeds is brought at a minimum level.

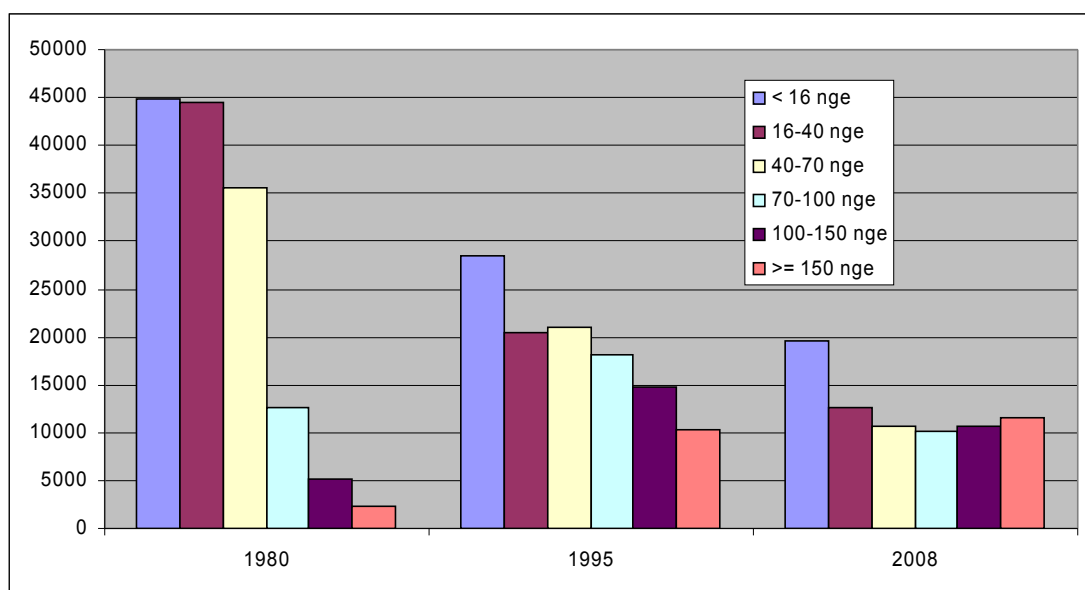
Dairy farms are found in all regions (with some concentrations in regions with low peat soils), arable farms mainly in regions with clay soils, intensive livestock farms mainly in the regions with sandy soils (central, south and east parts of the land), glass house holdings mainly near the sea (they have a profit of extra sun light). Open field horticulture holdings are found in different regions, with some concentrations, e.g. flower bulbs in the provinces along the sea.

Arable crops represent some 10% of the value of agricultural products (total value some 22-23 billion Euro per year, including agricultural services), horticulture crops around 40% and animal products around 50%. The main individual product of the Dutch agriculture sector is milk, with a value of around 3.5 Billion Euro. The main arable crop

is potatoes for human consumption, seed or production of starch; it represents around 50% of the production value of arable crops. In horticulture the value of ornamental products, including flowers (e.g. roses), bulbs (e.g. tulips), plants and trees, consists about 70% of production value. Thus, such production has a much higher value than the production of vegetables (e.g. tomatoes, cucumbers) and fruits (mainly apples and pears).

Structural development in agriculture shows an enlargement in the average size of farms over the years (figure 2). The number of farms is decreasing with some 3% per year. But this decreasing number of farms generates over the years a growing volume of products; in fact in the last decade mainly the volume of production in horticulture has grown.

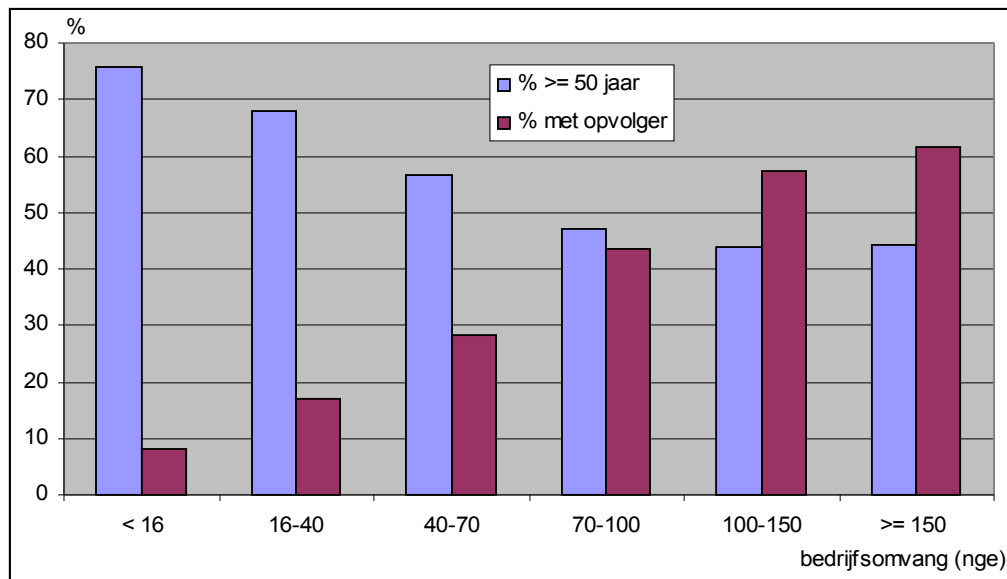
**Figure 2:** *Number of farms divided in classes of size units, 1980 -2008*



Source: Statistics Netherlands, farm census, LEI. Nge (Dutch size units) are conceptually equivalent to European Size Units

In the coming years the number of farms will fall further. Smaller farms have a higher percentage older farmers (figure 3, left bars). The number of farmers older than 50 years with a successor on average is (only) about 30%. Smaller farms have a lower percentage successors (figure 3, right bars). The reason for this is, in general, the lower level of income of smaller farms. Smaller farms are more depended of income outside the farm (external income) than larger farms. For a large part this external income consists of salaries for labour outside the farm of the farmer and the partner.

**Figure 3:** *Percentage of farms per size class (Dutch size units, nge) with an entrepreneur/owner being older than 50 years with (right bar) and without (left bar in blue) a successor, 2008*



Source: Statistics Netherlands, farm census, LEI.

#### 4.2.2 Multifunctional activities according to the Dutch agricultural census

Some 16.000 or approximately 20% of all farms (including horticulture holdings) has multifunctional activities on the farm, including management of nature and landscape, agritourism, provision of care or education, on farm processing of vegetal and animal products, renewable energy production, contracts work. On some farms more multifunctional activities are found. Most multifunctional farms are dairy and other grazing livestock farms, as well as arable and mixed farms. Intensive livestock farms and horticulture holdings are relatively less active in the field of multifunctional activities.

On management of nature and landscape some 10.000 farmers are active; in the field of recreation and agritourism some 2.500 and on the field of care of handicapped and older persons as well as children some 800 farms. The social activities on farms is the growing sector in the Netherlands.

Farms with multifunctional activities are found in all regions of the Netherlands, for a part around the (larger) cities as well as in regions with specific values on nature and landscape. The size of the farms with multifunctional activities is rather varied. However the smallest farms, less than 16 ESU, as well as the larger farms (above 150 ESU) are less active in this field. The larger farms are for larger part horticulture holdings (glass houses), the smallest farms for a larger part other grazing livestock farms.

## 5. Diversification and multifunctionality in the Italian FADN

Empirical analyses of diversification and multifunctionality suffer from the scarce availability of statistical information. Data about multifunctional practices (MP) are often available only on an aggregate level, apart from *ad hoc* surveys which are often limited to some territorial areas and are not repeated over time.

### 5.1 Pros and Cons

At present, the FADN is the only micro-database systematically gathered and *national in scope*, which, besides containing information at the farm level about structures, production and economic results, contains a set of information about farmers' decisions to provide products and services beyond the primary function. As a result, for example the FADN allows the application of behavioural models to estimate the choice of adoption of multifunctional practices (Esposti, Finocchio, 2008; Aguglia, Henke, Salvioni, 2009).

#### *The Italian FADN*

Recall further that, as of 2003, the Italian FADN survey is no longer conducted on a “voluntary sample”, but on one that is “statistically representative”. In particular, the field of observation is the population of commercial farms<sup>8</sup>, that is of the farms of more than 4 ESU (equal to 4,800 euro). Further, the sample is stratified<sup>9</sup> according to criteria of geographical region, economic size (ESU) and farm type (FT), and is randomly drawn from the ISTAT census<sup>10</sup>.

The Italian FADN sample is fixed at 17,000 farms (commercial) by a specific EC regulation (Reg. (EC) 60/1997). As the sample is random, it is possible to extend the results from sample to universe, using statistical inference tools defined by applying the weighting calculated by ISTAT for each stratum of the sample, shown as the ratio  $N/n$ , where  $N$  is the number of farms in the universe and  $n$  is the number of farms in the corresponding stratum of the observed sample.

In the works presented in the following sections and chapters, the sample used was from 2006.

The amount of information collected on non agricultural activities run by the farm-firm is in some way limited by the original “productivist” design of the survey. The FADN is continuously evolving in order to meet the new demands from analysts and politicians.

### *5.2 Information available*

The FADN survey provides information revealing the presence of MPs, associated with both environmental and socio-economic functions.

For the former, FADN provides information about the

- use of organic farming,
- use of low-impact techniques,
- production of landscape conservation services,
- production of bio-diversity conservation services,
- use of practices that encourage extended production.

While information about the last three MPs is only available for participation in agri-environmental programmes within Rural Development Programs<sup>11</sup> of the PAC, information for adoption of low-impact and organic production goes beyond mere

<sup>8</sup> A commercial farm is defined as a farm which is large enough to provide a main activity for the farmer and a level of income sufficient to support his or her family. In practical terms, in order to be classified as commercial, a farm must exceed a minimum economic size, expressed in terms of Gross Standard Margin (GSM).

<sup>9</sup> La stratificazione che permette di incrementare l'efficienza di campionamento, minimizzando il numero di aziende da campionare necessarie per rappresentare la varietà del campo di osservazione.

<sup>10</sup> Stratification allows greater sample efficiency, minimising the number of sample farms required to represent the variety in the field of observation.

<sup>11</sup> Participation information is given as receipt of environmental premium.

participation in public programmes. For organic practices, it is possible to have information on farms' certification of organic processes and/or products. For low-impact techniques, information refers to farms' self-certification.

In addition to these indications, FADN provides information about MPs producing socio-economic externalities, especially at the local level. For example, it is possible to know

- if the farm offers touristic services (farm stay, meals, etc.) services,
- uses designation of origin and protected geographical indication (PDOs, PGIs),
- produces traditional products.

Finally, the survey provides indications about more traditional forms of diversification such as:

- direct selling;
- on-farm processing;
- renting machinery;
- leasing of land;

whereas information is not currently available about energy production and the provision of social and therapeutic services<sup>12</sup>.

On the whole, the FADN survey appears to be more suited to measuring deepening rather than broadening. This result is expected, given the survey's original purpose focussed mainly on characteristic management of agricultural enterprises. As for the re-grounding category, the FADN features the presence of pluriactivity in the household, whereas it does not provide any indicator of the so-called "economical farming" behaviour.

Summing up, multifunctional practices considered in this work are those shown in the following table.

**Table 3:** *Multifunctional practices in the FADN data base*

<i>Indicator of multifunctional practice</i>	<i>Broadenin</i>	<i>Deepenin</i>	<i>Regroundin</i>
	<i>g</i>	<i>g</i>	<i>g</i>
Organic process/product certification		X	
Use of low-impact production methods		X	
Certification of origin		X	
Traditional products		X	
Direct sales		X	
Extensification		X	
Agritourism/farm stays	X		
Landscape conservation	X		
Biodiversity conservation	X		
Renting machinery	X		
Leasing of land	X		
On farm processing		X	
Pluriactivity			X

Table 4 describes the diffusion of the 3 strategies (broadening, deepening and re-grounding) among Italian farms, with a focus on family farms. This latter group

<sup>12</sup> In this regard, note that the FADN questionnaire has been re-formulated to survey this information in future.

represent 99.23% of total Italian farms. It is quite evident, in fact, that frequencies of adoption of different targeted strategies by family farms follow the same pattern of the whole farm population.

In terms of frequencies, the most diffused multifunctional strategies are those of the deepening type, with more than 81% of total farms, while the broadening ones reach only 40% of total farms. Note that data collected refer to the main activity, but in many cases a single farm may activate more than one strategy at a time and that's the reason why the 3 strategies don't sum up to 100%. Within the deepening, the most adopted activities are on-farm processing and direct sale, maybe due to the possibility to use internal resources quite easily, compared to the knowledge and high costs required by for example a certification (organic or quality products).

**Table 4:** *Diffusion of broadening, deepening and regrounding strategies in Italian farms, 2006*

	Italian Farms					
	Total	% of the category on total farms	% on each own category	of which family farms	% of the category on family farms	% on each own category
<b>BROADENING*</b>	263,528	<b>37.23</b>	100	261,558	<b>37.24</b>	100
Agri-tourism	12,789	1.81	4.51	12,538	1.79	4.46
Landscape conservation	4,266	0.6	1.50	4,228	0.60	1.50
Biodiversity conservation	1,957	0.28	0.69	1,956	0.28	0.70
Renting machinery	23,536	3.33	8.30	23,295	3.32	8.28
Leasing of land	238,701	<b>33.73</b>	84.18	236,973	<b>33.74</b>	84.25
Temporary leasing	2,305	0.33	0.81	2,286	0.33	0.81
<b>DEEPENING*</b>	335,233	<b>47.36</b>	100	333,249	<b>47.45</b>	100
Direct sales	161,235	<b>22.78</b>	27.97	160,363	<b>22.83</b>	28.01
Certification of origin PDO	71,482	10.1	12.40	70,573	10.05	12.33
Organic farming	29,567	4.18	5.13	29,341	4.18	5.13
Low impact farming	39,556	5.59	6.86	39,182	5.58	6.84
Extensification	8,816	1.25	1.53	8,816	1.26	1.54
On farm processing	265,765	<b>37.55</b>	46.11	264,170	<b>37.61</b>	46.15
<b>REGROUNDING</b>						
Pluriactivity				298,542	42.51	
<b>Total farms</b>	707,776	100		702,360	<b>99.23</b>	

\* Totals and percentages per category refer to the number of farms in which at least one practice has been activated. As a consequence they differ from the sum of the column.

Source: calculations on Italian FADN, 2006.

Among broadening strategies, the leasing of land has a very relevant weight (84% of total farms with broadening activities).

Pluriactivity, a strategy that can be applied on family farms only, is quite diffused. More precisely the survey records some source of extra-farming, agricultural and non, income in the 42.5% of total family farms.

The structural and economic characteristics of conventional and multifunctional farms are shown in Table 5.

**Table 5:** *Characteristics associated to conventional and multifunctional farms in Italy*

	Conventional		Deepening		Broadening		Pluriactive
	non fam.	fam.	non fam.	fam.	non fam.	fam.	fam.
Tot_land	80.1	12.79	97.46	16.78	<b>158.36</b>	<b>27.16</b>	13.16
Tot_used_l~d	63.53	11.14	64.41	14.29	<b>109.37</b>	<b>23.79</b>	10.9
Tot_AWU	4.09	1.23	3.6	1.2	<b>4.79</b>	1.58	0.91
fam_AWU	0.67	1	0.63	1.01	<b>0.88</b>	1.28	0.75
	0.16	0.81	0.18	<b>0.84</b>	0.18	0.81	<b>0.82</b>
ESU	6.81	5.22	6.56	5.11	<b>7.72</b>	<b>6.06</b>	4.85
cond11	0.56	0.94	0.3	0.96	0.41	0.95	0.96
cond12	0.37	0.05	0.58	0.03	0.45	0.04	0.03
lf_sole	0	0.96	0	0.97	0	0.92	0.97
lf_partner	0	0.04	0	0.03	0	<b>0.08</b>	0.03
lf_corp	0.3	0	0.63	0	0.36	0	0
lf_other	0.7	0	0.37	0	0.64	0	0
circ0	0.34	0.42	0.23	0.2	<b>0.45</b>	<b>0.49</b>	0.28
circ3	0.15	0.13	<b>0.53</b>	<b>0.29</b>	0.24	0.21	0.13
circ4	<b>0.51</b>	0.46	0.25	0.51	0.31	0.29	<b>0.59</b>
upland	0.05	0.13	0.17	0.15	0.28	0.19	0.13
hill	0.23	0.41	<b>0.65</b>	<b>0.6</b>	0.33	0.43	0.43
flatland	0.72	0.45	0.18	0.24	0.39	0.38	0.44
ft_cop	0.19	0.23	0.11	0.09	0.22	0.19	0.14
ft_hor	<b>0.07</b>	<b>0.06</b>	0	0.02	0.05	0.03	0.03
ft_wine	0.02	0.09	<b>0.1</b>	0.09	0.07	0.05	0.11
ft_fruit	<b>0.17</b>	<b>0.19</b>	0.06	0.06	0.02	0.07	0.11
ft_oliv	0	0.03	<b>0.34</b>	0.2	0	0.05	<b>0.18</b>
ote_latte	0.03	0.05	0.06	0.06	<b>0.14</b>	<b>0.14</b>	0.04
farm_net_i~e	125962.86	14829.49	46885.19	13968.48	182478.59	26882.73	6879.67
Hh_indep_l~e	0.03	0	<b>0.13</b>	0.08	0.1	0.06	<b>0.37</b>
Hh_dep_lab~e	0.15	0	0.1	0.18	0	0.1	<b>0.69</b>
Hh_pensions	0.16	0.32	0.18	0.3	0.19	0.22	0.34
Hh_capital~e	0	0.01		0.01		0.01	0.03
rf_ulf		4409.7		7140.48		<b>9029.3</b>	402.26

Conventional family and non family farms are characterized by large physical and economic (ESU) dimension in all the groups. It is interesting to note that the conventional non family farms have the smallest average number of hectares (UAA) among the targeted groups. In terms of location, they are relatively more present in the Southern regions (circ4) and in the plains.

In terms of production, they tend to be more specialized in horticultural and fruit production. Farms using deepening strategies are on average slightly larger than their



conventional colleagues. The large diffusion in central regions, in hilly areas as well as the higher presence of corporations in this group are most likely linked to the higher specialization in wine and olive sectors, two industrialized productions when speaking in terms of quality products, (PDO). The non family farms using deepening strategies are relatively less diffused in Southern regions; in addition they are characterized by the highest family to total labour units ratio. Farms making use of broadening strategies are the largest among the targeted groups either in terms of hectares and in economic terms. It is interesting to note that in the sub-group of family farms the sole ownership is relatively less frequent among these farms, while “other non corporate” legal status are more frequent. They are particularly diffused in Northern regions and in the uplands and they have relatively more specialized than the other groups of farms in livestock and dairy production. They show the best economic results, it is particularly interesting to note that the family farm income per unit of family labour is the highest among the groups.

The pluriactive family farms appear to be the weakest of the targeted categories. As for the structures (physical and economic dimension, altimetry, legal status) they are closer to the conventional farms than to the two other multifunctional groups. They are small farms, particularly diffused in the southern regions, relatively more specialized in olive growing with young and female holders. The economic results of these farms are very poor, especially the family farm income per unit of family labour (that is the net farm income that can be distributed among the family workers) is very low. It is difficult to say on the basis of these informations if they are hobby or limited resource, inefficient farms. In hobby farms the poor economic results may not be a problem, given their involvement in agriculture is justified mainly by non economical (e.g. residential) considerations. Whereas in the case of limited resources farms the poor economic results are a symptom of poverty and inefficiency.

## **6. Diversification and multifunctionality in the Dutch FADN**

Table 6 describes the diffusion of the three strategies (broadening, deepening and regrouping) among Dutch farms, with the details for family farms. This latter group represents a large majority, 97.81%, of total Dutch farms. Table 7 shows the frequencies of adoption of different targeted strategies by family farms following the same pattern of the whole farm population.

The most prevalent multifunctional strategy is that of broadening, with more than 66% of the total number of farms, compared with 19% of deepening. Note that the data collected refer to the main activity, but in many cases a farm is active in more than one strategy at a time and because of this the three strategies together count for more than 100%. Within broadening, the most adopted activities by farms are contract work and leasing of land. In the Netherlands this is not always seen as a multifunctional activity amongst farmers, but in the definition of Van der Ploeg it is part of broadening the incomes of the farm. Leasing land is often seen in combinations of dairy and arable farming to rotate different types of crops, grass and arable crops, to maintain the fertility of the land. Within deepening, the direct sale of unprocessed products is the most adopted activity. This activity can be done on a small scale and doesn't require much labour. Some farmers present their products along the road without surveillance. Almost half of all the farms have off farm incomes through labour. This means that only 14% of the farms can be seen as conventional farms.

**Table 6:** *Diffusion of broadening, deepening and regrounding strategies in Dutch farms, 2007*

	Total	Dutch Farms			% of the category on family farms	% on each own category
		% of the category on total farms	% on each own category	of which Family farms		
<b>BROADENING</b>	40,002	<b>66.47</b>	100	39,470	<b>67.05</b>	100
Agri-tourism total	5,296	8.80	13.24	5,246	8.91	13.29
Accommodation	2,073	3.44	5.18	2,073	3.52	5.25
Excursions	1,476	2.45	3.69	1,426	2.42	3.61
Restoration	389	0.65	0.97	389	0.66	0.99
Sports	688	1.14	1.72	688	1.17	1.74
Storage	1,811	3.01	4.53	1,811	3.08	4.59
(nature conservation)						
Landscape conservation	14,548	24.17	36.37	14,470	24.58	36.66
Biodiversity conservation	-			-		
Renting machinery (contract work)	17,207	<b>28.59</b>	43.02	17,138	<b>29.11</b>	43.42
Leasing of land	22,852	<b>37.97</b>	57.13	22,478	<b>38.18</b>	56.95
Temporary leasing	-			-		
Green care	516	0.86	1.29	516	0.88	1.31
Energy	1,091	1.81	2.73	1,016	1.73	2.57
<b>DEEPENING</b>	11,224	<b>18.65</b>	100	10,964	<b>18.63</b>	100
Direct sales unprocessed products	9,433	<b>15.67</b>	84.04			
Direct sales processed products	442	0.73	3.94	442	0.75	4.03
On farm processing	872	1.45	7.77	872	1.48	7.95
Certification of origin PDO	-			-		
Organic farming	2,117	3.52	18.86	2,088	3.55	19.04
Low impact farming	-			-		
Extensification	-			-		
<b>REGROUNDING (smaller part of sample *)</b>						
Pluriactivity	29,659	<b>49.28</b>	100	29,286	<b>49.75</b>	100
Conventional (smaller part of sample *)	8,125	<b>13.50</b>	100	8,014	<b>13.62</b>	100
<b>Total farms</b>	60,182	100		58,867	<b>97.81</b>	

\*) only the farms of which off farm income is known = 50% of total sample)

Conventional farms, only family farms are represented, on average have a small number of hectares (UAA). Only the group of “deepening non family farms” have a smaller number of hectares; for a large part these are horticulture enterprises (glasshouses). In the group of conventional farms the percentage of family labour is around the average of around 60% all the farms. The group has a large number of dairy farms and a broad range of other types of agricultural production, except the arable farms. The family income is above the average of all the farms as well as the income of farmers.

Only a small number of non family farms have deepening activities. In this group the farms have on average a small number of hectares, a large number of labour units as well as ESU. Only 10 percent of the labour is input from the family. This corresponds with the large number of glasshouses in this group. Also, this is a group of young farmers. The family farms with deepening activities have an average number of around 35 hectares. The labour input of the family is more than half of all the labour (AWU) used on the farm. The main types of agricultural production in this group are dairy, other (non-specialised) horticulture and other (non-specialised or combinations of) agriculture.

The largest group of all the farms is the group with broadening activities. As seen in table 6 this group represents more than 66 percent of all the Dutch farms. Still, there are many differences between farms from this group and the average farm. The non family farms with broadening activities are young farmers who have the highest number of hectares. Only a quarter of all the labour input is from the family. The number of ESU is almost four times the average of other farms. This can also be seen in the income of the family, which is the highest of all the farms as well as the income of the farmer. The types of agricultural production are divided amongst all types but the dairy farms, intensive livestock and glasshouses are the major part. The family farms with broadening activities have a large input of family labour. The types of agricultural production that are represented in this group are dairy farms and farms with other (non-specialized) agricultural production.

Almost half of all the Dutch farms have an income earned with off farm labour. Still, the labour input on the farm is more than half of the total AWU used on the farm. This group of farms has the lowest family income from the farm as well as the income of the farmers. The types of agricultural production most represented in this group are dairy farms and farms with other (non-specialized) agricultural production.

**Table 7:** *Characteristics associated to conventional and multifunctional farms*

	Conventional *)		Deepening		Broadening		Pluri-	Total
	non fam.	fam.	non fam.	fam.	non fam.	fam.	active *)	
Farms represented		8,014	260	10,964	532	39,470	29,286	60,102
tot_land		22.8	16.1	35.2	48.7	41.4	34.9	34.0
UAA		21.7	14.2	32.8	43.5	39.0	33.3	32.1
tot_AWU		2.28	12.96	2.66	5.96	1.98	2.18	2.19
fam_AWU		1.42	1.35	1.46	1.51	1.34	1.26	1.32
Fam/tot AWU (%)		62	10	55	25	68	58	60

ESU	144	670	141	424	129	107	125
Distribution of farms							
Arable	1	6	9	6	17	15	14
Dairy	39	0	20	23	31	35	32
intensive livestock	15	0	4	25	6	8	9
Glasshouses	18	89	12	24	5	4	9
other horticulture	13	6	25	6	12	10	12
other agriculture	13	0	30	16	28	27	24
farm_net_i~e (income family)	55,230	94,392	44,140	238,761	49,800	36,022	45,269
Hh_dep_lab~e	0	1,121	4,725	3,942	6,043	14,454	7,146
Hh_pensions	4,406	289	3,484	1,232	4,935	5,570	5,402
Hh_capital~e	8,373	3,068	3,832	1,718	3,457	2,410	3,830
rf_ulf (income farmer)	53,966	88,227	39,990	237,179	47,489	33,285	42,326
Farmers' age	49	44	51	45	51	49	50

\*) only the farms of which off farm income is known = 50% of total sample)

## 7. Conclusions

In this paper we compared the process of diversification and the multifunctional path of Italian and Dutch farms. In the first part of the paper we clarified the main differences between three concepts that are often and mistakenly considered synonymous: diversification, multifunctionality and pluriactivity.

Focussing on Van der Ploeg's categories of deepening, broadening and regrounding, we introduced the switch from a productivist mode of production in agriculture to a post-productivist one. Looking at the multifunctionality patterns, if the sole objective of farms is agricultural production, some externalities are still produced, but in amounts not planned and controlled by the farmer, since costs and benefits associated to them are not included in the farm decision process of the farmers. So, farmers become multifunctional when the production of externalities is internalised in their decision process and there is scope for economic values in the production of externalities.

Moving along this theoretical distinction, we subsequently tried to evaluate the diffusion of multifunctional and diversification practises at the farm level in Italy and the Netherlands, working on the FADN data base and trying to translate the concept of multifunctionality into a "measurable" one according to the FADN data. This was not an easy task, since the FADN data base still has a very productivist orientation, given its nature and its objectives. However, it is the only micro-oriented data base systematically gathered at the national level, so it gives the possibility to make comparative studies between EU Member States. Moreover, FADN is continuously evolving and it will soon include more non-productivist aspects of farms' activities. In addition, what can be measured by using the FADN data is diversification at the farm level. This information can then be complemented with other sources of data to define multifunctionality at the territorial level.

Given the productivist and post-productivist pattern described before, it is rather difficult to draw a clear line between what is the outcome of the former and of the latter path. For example, some typical cheese production in the Netherlands, as well as some

quality products in Italy, are definitely part of the productivist picture, although they are assuming new features that well match the post-productivist one and the can currently be considered within the categories of Van der Ploeg, as a process of farm transformation into the direction of multifunctionality.

Furthermore, the exercise of comparison between countries is hampered by the differences between national FADNs. With regard to this issue, some harmonisation, possibly directed by DG Agri, would help and is needed for further research into this matter.

Finally, when it comes to the results of the comparison, some differences clearly stand out, even though it is not so clear why they exist and what they are caused by. Clearly, there are evident institutional reasons, but also the implementation of policies is different and could explain many of the different results. Further investigation on these issues is a plausible agenda for the future.

All in all, the main outcomes of this paper are the following:

- the product mix offered by farm business is very complex. It includes traditional agricultural commodities, non agricultural commodities and especially services rapidly growing (educational, social, etc.) as well as non-commodity outputs, for example landscape or biodiversity conservation;
- farm household resources are progressively devoted to off farm activities such as in the case of pluriactivity or in that of land used for the production of wind or solar energy or for storage.

As a consequence, the share of revenues from selling food and fibres is relatively lowering, while that originated by non traditional deepening and broadening activities is increasing. At the same time, agriculture is no longer the only and sometime not even the dominant source of income for the farm household.

The result is that the statistical information gathered by farm surveys designed to monitor a productivistic agriculture are not able to take into account the complex situation defined by post-productivism and rural development. Data collection systems have to be revised to provide a fair and exhaustive view of farm business/household income situation and measurement.

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