Ministry for Agricultural and Forestry Policies

INEA

National Institute of Agricultural Economics

MEASURING SUSTAINABILITY

Indicators for Italian Agriculture

Coordinated by
Antonella Trisorio

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This project was funded by the Ministry for Agricultural and Forestry Policies, within the precincts of Law 449 of 23 December 1999 containing “Rationalisation of Operations in the Agriculture, Agri-food and Forestry Sectors” - Ministerial Decree 52454 of 29 December 2000.

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Indicator charts:

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Thanks:

Beneficial comments were received from participants of the 8th IWG.AGRI Seminar “Perspectives for Agriculture and Rural Indicators and Sustainability” organised jointly by OECD and EUROSTAT, Paris, 21-22 November 2002; and from participants of the “ECE/EUROSTAT/FAO/OECD Meeting on Food and Agricultural Statistics in Europe”, organised at the United Nations, Geneva, 2-3 July 2003.

Presentation

Sustainable development is the world wide priority objective as defined in the "Declaration of Rio" at the conclusion of the 1992 United Nations Conference on the Environment and Development. Pursuing this objective implies preserving the productive potential of the economy and thus seeing to it that capital stock (natural, human and man-made) does not decrease over time. Only under these conditions will it be possible to "meet the needs of the present without compromising the ability of future generations to meet their own needs".

Integrating the principles of sustainable development within sector policies is one of the main strategic objectives of the European Union. In this framework, establishing sustainable agriculture takes on central importance, given the close interdependence between agricultural activity and natural capital.

Monitoring and assessing agriculture's impact on the economic, social and environmental system makes it possible to verify progress towards the objective of sustainability. Among the tools at hand, indicators are some of the most appropriate to the task. As confirmed by the European Commission, "indicators provide the basis for assessing progress towards the long-term objective of sustainable development". Indicators as support tools in decision-making are being used more and more by public administrations, because of their efficacy and flexibility, and the possibilities they offer for making the space-and-time comparisons necessary for designing and correcting policy measures in a timely manner. Good examples are the complex system of indicators developed by the European Commission for monitoring and assessing Rural Development Programmes, and the widespread use internationally of periodic reports on agricultural sustainability based on analysis of indicators.

Specifically, the indicators of agri-sustainability offered here, by making reference to social, economic and environmental aspects and their interactions, make possible a wide-spectrum analysis and an overall view of Italian agriculture's contribution to sustainable development. Indeed, integrated analysis of the three dimensions helps overcome problems arising from a partial approach by individual dimension, which is not consistent with the principles of sustainable development.

The proposed indicators can be used as support by regional administrative bodies: a) in identifying potential weak points of an economic, social and/or environmental nature that distract regional agriculture from the objectives of sustainability; b) in suggesting possible actions to improve the efficacy of regional policies, and their implementation, with regard to the objectives of sustainability; c) in verifying progress achieved over time in various dimensions (social, economic and environmental); d) in increasing awareness about sustainability among economic, institutional and social stakeholders.

This project is intended to provide regional administrative bodies with a tool that will help reduce the gap between objectives of agricultural sustainability and their enactment.

To verify the sustainability of Italian agriculture over time, this report will be updated periodically.

Prof. Simone Vieri
(INEA President)

Rome, July 2004

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Introduction: objectives and methods of study

1. Measuring sustainability

The earliest studies on sustainability were made by the United Nations immediately following the Conference on Environment and Development held in Rio de Janeiro, Brazil, in 1992. During the 1990s, work continued by the OECD, which adopted the Pressure-State-Response (PSR) analytical framework to show the relationships between agriculture and the environment. Together with the work of EUROSTAT's Joint Research Centre, the European Commission later developed a series of indicators to assess the progress of the Fifth Framework Programme. This activity received further input from major theoretical and practical contributions deriving from national, European and extra-European experience[1].

From this body of studies, one thing became clear: the lack of a universally agreed-upon definition of the concept of sustainability; and, as an obvious consequence, the lack of a common approach for measuring it, because the parameters of reference adopted (quantitative and qualitative) were not homogeneous and varied from country to country: this resulted in a lack of uniformity both generally (as regards sustainability objectives) and specifically (as regards the quality of data used for measuring them).

One crucial aspect for establishing sustainability indicators is the adoption of a specific concept of sustainability (worked up from scratch or chosen from the many available in the literature). Of the many, often divergent existing definitions of sustainability, we have adopted the one contained in the Bruntland Report (*Our Common Future*) of the United Nations World Commission on Environment and Development, which due to its breadth is definitely the most widely used and generally accepted, especially on an international level. According to this definition, "sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 43). This approach towards sustainability is based on the principle of preserving opportunities for "production", or productive capacity in terms of the availability of production factors. The concept of sustainability is thus seen as the duty of each generation of individuals towards its successors, to ensure that the availability of capital stock[2] will not decline over time (the rule of "constant capital").

Expressed in this way, the concept of sustainability implies the possibility of substitution among the various components of capital: thus, what we owe our successors is a generalised productive capacity (Solow, 1992), rather than some specific component of capital stock. This interpretation, which assumes the possibility of substitution among the components of capital, answers to a rule of "weak" sustainability: development is sustainable even if some component of capital (such as natural) is declining, provided the total capital stock is not falling.

Much of the ecological literature, however, rejects substitutability between natural capital and other forms of capital: at least across some categories of natural capital. By this more restrictive approach, a second variant on the rule of "constant capital" becomes valid: the rule of "strong" sustainability, by which natural capital must be held constant (or increasing) within the more general constraint that total capital stock be constant (or increasing). This position is based on the consideration that natural capital includes some resources that are technically irreversible, and

[1] See for example the experience of Australia (Commonwealth of Australia, 1998), Finland (Aakkula, 2000), the United Kingdom (MAFF, 2000) and Canada (McRae T. *et al,* 2000).

[2] Capital assets take three forms: 1) man-made capital (reproducible capital); 2) human capital (stock of knowledge and skills); 3) natural capital (any natural asset yielding a flow of ecological services with economic value over time) (Pearce, Atkinson, 1995).

others that are effectively irreversible. Awareness of natural capital is furthermore characterised by conditions of uncertainty. Consequently, assuming there is a widespread aversion to risk on the public level, there are good reasons for not employing natural resources beyond levels held to be critical for their existence or reproducibility. The irreversible nature of a significant part of natural capital, and the uncertain knowledge thereof, are determining factors in the definition of strong sustainability.

A modified version of the rule of "strong" sustainability comes from placing special importance on certain components of natural capital, defined as "critical", or those providing non-substitutable environmental services: the "life support" functions of ecosystems. According to this version of "strong" sustainability rule, it is "critical" natural capital that must not decline over time, whereas the use of other components of natural capital may be analysed according to the "weak" sustainability approach (Atkinson and Pearce, 1993; Pearce and Atkinson, 1995).

From the contrast between these positions, as indicated in Agenda 21[3], a multidimensional sustainability concept emerges that includes environmental, economic and social objectives. Many complex relationships exist among these components. Attempts to achieve differing objectives can lead to synergies, but may also generate conflicts. These can be solved, obviously, by making wise policy decisions that will lead to practical and operational equilibrium.

Once a definition of sustainability has been adopted, the problem becomes how to translate it into concrete action and practice. Major obstacles arise: a) the existing interrelationships among different economic sectors and dimensions; b) the implicit absence of territorial borders in the concept of sustainability. In no case, indeed, is it conceivable to limit application of the principle of sustainability to one economic sector, or to a specific territory considered in isolation. The enactment of policies whose goal is sustainability within a single sector or territory is also destined to produce effects on other economic sectors or territories. Analytically (in assessing activities that will lead to sustainability) and practically (in making concrete applications of such policies), this implies a complex activity of studying and forecasting the potential effects of actions taken in a single sector or territory on other sectors and territories. The goal of implementing indicators for sectors and territories is to provide a fundamental contribution to such studies and forecasts.

The object of this study is an analysis of sustainability – economic, social and environmental – within the specific sector of Italian agriculture, considering both its relationships with the other sectors of the economy, and the complex articulation (and differentiation) at the territorial level with special attention to rural areas. Our aim is to provide a set of sustainability indicators that will be a tool for making wise decisions in agricultural policy-making: in line with the need, as stated by the European Union, to make sustainable development the core concern of all sectors and all policies, especially in agriculture (Commission of the European Community, 2001a). In this context, the need is clear for policy makers to have cognitive, informative tools that will allow them to adapt public policy to the objectives of sustainability, and encourage their adoption within sector policies.

2. How indicators were chosen

On a general level, sustainability indicators are a tool for monitoring and assessing the sustainability of economic actions and policies. They are generally considered a "vehicle for summarising, or otherwise simplifying and communicating, information about phenomena that are of importance to decision-makers" (Moxey *et al*, 1998). "Indicators provide the basis for assessing progress towards the long-term objective of sustainable development. Long-term targets only have meaning as policy goals if progress towards them can be assessed objectively" (Commission of Euro-

[3] Agenda 21 is a comprehensive plan of action to be taken globally, nationally and locally by organisations of the United Nations System, Governments, and Major Groups in every area in which human activity impacts on the environment (http://www.un.org/esa/sustdev/documents/agenda21/index.htm).

pean Communities, 2001b), by highlighting the potential trade-offs among the three dimensions of sustainability – economic, social and environmental – and among sectors of the economy. Indicators thus provide support for policy-makers in designing and adapting policy, and also make it possible to identify potential priorities for allocation of available resources.

In selecting indicators, we have referred mainly to documents of the European Commission; in particular: 1) "A Framework for Indicators for the Economic and Social Dimensions of Sustainable Agriculture and Rural Development" (European Commission, 2001) for indicators relating to the *socio-economic dimension*; 2) "Indicators for the Integration of Environmental Concerns into the Common Agricultural Policy" (Commission of European Communities, 2000) and the experience of OECD (Organisation for Economic Co-operation and Development), EEA (European Environment Agency) and ECNC (European Centre for Nature Conservation) for indicators relative to the *environmental dimension.*

The decision to use mainly those indicators proposed by the European Commission and other international institutions and organisations was made: a) to verify the possibility of enacting proposals based on the current information system in Italy; b) to make international comparisons (based on a set of shared indicators). This choice implies that the criteria used in selecting indicators are those adopted by the institutions referred to[4], with the further restriction of availability of data on a national/regional level. Where possible, preference has also been given to simpler indicators (from the point of view of processing and the number of parameters they consist of), generally ensuring greater transparency and immediacy of information.

3. The three dimensions: economic, social and environmental

In this report, as stated above, sustainability in agriculture is presented by distinguishing between economic, social and environmental dimensions.

The *economic dimension* mainly refers to: a) efficient use of resources; b) competitiveness and viability in the agriculture sector; c) profitability of the agriculture sector; d) agriculture's contribution to the development and/or conservation of rural areas; e) the diversification of sources of income within farming families.

The *social dimension* refers to equity meant as "equal opportunity", both territorially (between rural and non-rural areas) and sector-wise (between agriculture and other economic sectors), between social groups and between men and women in the sector. The issues considered under this heading are opportunities for use and farmers' access to resources and social services. Most importantly, the indicators refer to human capital and its characteristics.

The *environmental dimension* concerns management and conservation of natural resources. The environmental system is analysed on the basis of a list of environmental objectives of political relevance[5]: protection of the landscape and biodiversity; and protection of water resources, soil and air. The indicators are based on the *DPSIR framework* (Driving force, Pressure, State, Impact, Response), which makes it possible to structure and organise environmental information in an appropriate manner.

[4] For example, the criteria adopted by the European Commission for choosing agri-environmental indicators are as follows: 1) policy relevance: they must be pivotal to key issues; 2) reactivity: their value must change sufficiently quickly in response to action; 3) analytical soundness: they must be based on sound science; 4) measurability: they must be feasible in terms of current or future availability of data; 5) ease of interpretation: they must communicate essential information in a way that is unambiguous and easy-to-understand; 6) cost-effectiveness: their cost must be proportionate to the value of the information they provide (Commission of European Communities, 2001c).

[5] For example, in the Sixth Environmental Action Programme, soil protection, air quality and the sustainable use and management of natural resources were considered by the European Union to be matters of central importance.

For each of the three dimensions, a set of priority objectives has been established from the outset. Using these as a reference, indicators were then selected based on currently available data. The constraints of data availability make it possible to verify the present possibilities for "sustainability analysis".

With regard to the time element, the indicators are derived from the longest time series possible – in most cases at least five years. The most opportune length for time series depends on the type of indicator.

In some cases the available time series were shorter than ideal. This was especially true for environmental indicators involving matters only recently deemed of importance to the public. In such cases we have included these indicators on the list, to establish an initial reference level that will allow future assessment of progress.

The geographical unit we adopted is the smallest administrative level possible (administrative region, municipality). By imposing territorial limits, though this creates a distortion in assessing sustainability nationally, we have made this project a tool that will be more easily usable for regional administrative bodies.

Each indicator is shown in two graphic layouts that show trends by area (North-East, North-West, Centre, South and Islands) and by region. There is also a simplified representation (Chernoff icon) of the indicator's performance in terms of sustainability, by area and against the national average. This summary assessment refers to each indicator, considered independently of the others. Thus, interactions between different indicators are not considered, so as not to introduce elements of subjectivity into the analysis.

There are 38 indicators overall, 13 of which deal with the socio-economic dimension, and 25 of which deal with the environment.

The former are geared toward analysing the efficiency of production in the agriculture sector, its capacity to create employment and its contribution to conservation of rural areas.

Specifically, the social dimension is analysed in two aspects: 1) *human capital*, with reference to farmers and the number of people employed in agriculture within the economy; 2) *equal opportunity*, with special emphasis on gender among farm workers and on rural populations.

The economic dimension is developed around three points: 1) *efficiency*, associated mainly with the use of inputs; 2) *viability*, related to the potential for farms to survive in the market; 3) *competitiveness*, especially as regards the sector's contribution to the nation's wealth, and the process of capital accumulation within it.

Many of the indicators included in the social and economic dimensions are imported from other disciplines, and are used for assessing sustainability by assigning them different valences. This does not exclude the need to delve further into these areas, so as to arrive at indicators specifically designed for the analysis of agricultural sustainability.

The 25 indicators dealing with the environment provide information about the impact of agriculture on the five components[6] on which analysis of the environment is structured, based on politically relevant environmental objectives defined in the preliminary phase.

Soil is considered a dynamic element and a non-renewable natural resource. Agricultural development has contributed to the degradation of the soil's chemical, physical and biological characteristics. The selected indicators are intended to assess the relationships between agriculture and soil, using measurements that show the pressure brought to bear by the agricultural activities of livestock raising, the use of fertilisers and plant protection products, and other polluting substances.

Assessing the impact of farming on *air quality* is quite complex. Though agriculture is not the main source of atmospheric emissions, it nonetheless has an effect in reducing the ozone layer

[6] Environmental components considered are: 1. soil; 2. atmosphere; 3. water resources; 4. biodiversity; 5. landscape.

through gaseous emissions (methane, carbon dioxide and ammonia). The indicators for this environmental component therefore are geared toward assessing the quantity of these emissions and energy consumption (which is responsible for part of emissions).

The relationships between agriculture and *water resources* are also rather complex, owing to the difficulties of isolating the impact of farming from that of other activities. Assessing sustainability in the use of water in agriculture takes into consideration: 1) the *quantitative aspect*, with special emphasis on the use of water resources and management (the type of technology used for irrigation, types of supply sources, etc.); 2) the *qualitative aspect*, relating to possible pollution of water resources (balance of nutrients, leaching, etc.).

According to the definition stated by the Convention on Biological Diversity[7], "*biological diversity* means the variability among living organisms from all sources, including *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems". Biodiversity may be analysed in terms of: a) *genetic diversity* (within species), which has to do with diversity of genes within "domestic" species (vegetable or animal); b) *diversity of species* (among species), that is, the number of species and population of wild species (flora and fauna) affected by agriculture, including soil biota, and the effects of non-native species on agriculture; c) *diversity of ecosystems* related to diversity of species, ecological processes and functions that can be observed in various ecosystems "formed by populations of species relevant to agriculture or species communities dependent on agricultural habitats" (OECD, 2001). The selected indicators mainly address the last two points; the first has not been considered for the moment, partly because of insufficient available data, and also because of its excessive depth with regard to the objectives of our analysis.

Landscape is an issue similar to biodiversity in the complexity of articulating the elements that make it up, and is linked to biodiversity in the similar nature of its relationships to agriculture. In this study, landscape is assessed mainly by using "indirect" or proxy indicators that show agriculture's impact through changes in form and structure of the landscape (concentration and intensification of farming, for example).
For an analysis of the issues of biodiversity and landscape, some indicators of forested land were also considered, as a basic component for assessing the degree of naturalness of the agri-ecosystem.

4. How indicators were classified

As stated above, for each dimension (economic, social and environmental) a group of priority objectives was established, with indicators selected accordingly. The whole process of selecting and classifying indicators was done in full awareness that only by simultaneously pursuing all objectives (wholly or in part) can the more general objective of sustainability be achieved.

In order to facilitate international comparisons of results, indicators have been classified using the *DPSIR framework* (Driving force, Pressure, State, Impact, Response)[8] that make up the causal chain in the relationships between agriculture and the three dimensions of sustainability under

[7] The Convention was ratified at the United Nations Conference on Environment and Development held in Rio de Janeiro, Brazil, in 1992.

[8] According to the AEA definition, driving forces (D) are the underlying causes of environmental impact. Pressures (P) relate directly to the causes of problems, and refer to actions that produce environmental impact. State (S) describes environmental conditions by referring to quantity and quality of environmental resources. Impact (I) refers to variations in the state and the effects of driving forces. Response (R) concerns measures adopted to solve various problems that have been identified (agri-environmental measures or more restrictive environmental regulations, for example), or rather actions adopted by society in response to environmental changes. These actions can be for: a) preventing and/or reducing negative impact; b) repairing environmental damage; c) preserving or restoring conditions of environmental resources.

consideration. This model has been extended from the environmental to the social and economic dimensions. The indicators classified according to the scheme described are listed in Table 1.

Table 1 - List of indicators of sustainability

		SOCIAL DIMENSION	DPSIR
1	**Human Capital**	Agricultural employment	D
2		Ageing index for farmers	D
3		Educational level of farmers	D
4	**Equal opportunity**	Breakdown of workers in agriculture	D
5		Resident population in rural municipalities	D
		DIMENSIONE ECONOMICA	
6	**Efficiency**	Profitability of labour	D
7		Profitability of land	D
8		Productivity of labour	D
9		Productivity of land	D
10	**Viability**	Marginalisation	D
11		Diversification in farm holders' activities	D
12	**Competitiveness**	Share of agricultural value added in total value added	D
13		Fixed investments in agriculture	D
		ENVIRONMENTAL DIMENSION	
14	**Soil**	Herd density	P
15		Livestock	S
16		Phosphorus balance	P
17		Use of plant protection products	P
18	**Atmosphere**	Methane emissions (CH_4)	P
19		Ammonia emissions (NH_3)	P
20		Carbon dioxide emissions (CO_2)	P
21		Direct use of energy	P
22	**Water resources (quality)**	Nitrogen balance	P
23		Potential leaching of nitrates	P
24		Fertiliser use	P
25		Application of a fertilising plan	R
26	**Water resources (quantity)**	Irrigation systems	P
27		Irrigated land	D
28		Type of catchment	S
29	**Biodiversity**	Protected areas	R
30		Condition of plant species	S
31		Woodded land affected by fire	P
32		Organic farming	P
33		Agri-environmental measures	R
34	**Landscape**	Utilised Agricultural Area	R

35	Afforestation index	S
36	Intensification	P
37	Concentration	P
38	Man-made and natural elements	P

The inclusion of indicators within the context of a specific issue and/or dimension is a matter of interpretation and perspective. The classification adopted here therefore is not rigid, and some indicators may fit into other categories based on the questions they are called upon to address. The balance among the number of economic, social and environmental indicators is in fact not necessarily required, given: a) the different level of aggregation of parameters (and therefore of information) of each indicator; b) the possibly incorrect categorisation of the indicators; c) uncertainty about the most appropriate measures to be used (U.S. Interagency Working Group on Sustainable Development Indicators, 1998). Furthermore, since the validity of a set of indicators is generally limited time-wise because of their marked dependence on policy priorities and level of knowledge, there should be enough margin of flexibility in the analysis scheme to allow for opportune variations, if policy priorities shift or our base of knowledge expands.

5. Implementazione e rappresentazione degli indicatori

Analysis of the indicators was made both by geographical area and by administrative region[9]. The length of the time series is not uniform for all indicators, but varies according to availability of data and type of indicator.

The data used come exclusively from official sources[10]. Though this poses a limit to the analysis on one hand, on the other it provides a realistic picture of the current possibilities for implementing internationally proposed indicators. Some of the indicators chosen are in fact subject to limitations owing to lack of available data, which in some cases means insufficient geographical coverage and in others incomplete time series.

The indicators are mainly the result of simple mathematical calculations between parameters. Some indicators included in the environmental dimension, especially “nitrogen balance”, “phosphorus balance”, “methane emissions” and “ammonia emissions”, use the ELBA economic-ecological model designed by the University of Bologna and taken from the European CAPRI model.

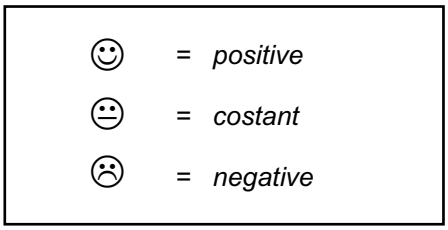
The indicators are organised in a two-part format. The first part contains general information about the issue under examination; the second describes the trend of the time series in various areas and regions. The aim of this study is to provide a key for reading and a tool for interpreting the progress of Italian agriculture towards sustainability, not to “read” the data. Therefore, a basic comment is made about the trend of each indicator, in order to allow the data to speak for themselves, and leaving interpretation to sector experts and policy decision makers.

Comparisons among the regions are shown using graphics, to provide an immediate view of progress. Finally, a summary assessment is made of the progress towards sustainability of the indicators in question, generally based on the path of the time series and using a schematic representation (Chernoff icon).

[9] Areas and the regions they include are: North-West (Piemonte, Valle d’Aosta, Lombardy, Liguria); North-East (Trentino Alto Adige, Veneto, Friuli Venezia Giulia, Emilia Romagna); Centre (Tuscany, Umbria, Marche, Lazio); and South and Islands (Abruzzo, Molise, Campania, Basilicata, Puglia, Calabria, Sicily and Sardinia).

[10] Most of the indicators were obtained with data from ISTAT, with the exception of the indicators of “direct use of energy”, which come from the FADN database; “type of catchment”, taken from INEA data; “areas used for organic farming”, with data from the Biobank database; and “conditions of species”, which use WWF data (Italian Botanical Society).

Figure 1 - Schematic representation of the progress of agriculture towards sustainbility



Four appendices close the report. The first provides tables for each indicator, with the time series of data shown by area and region. In some cases, in addition to the time series of the indicator shown in the format, data will be shown relative to alternative indicators of the issue under analysis. In the second, illustration is made of the method of calculation used for elaborating each indicator, with information about data (source, length of time series). The third presents a survey of political documents of the European Union having to do with sustainable agriculture and rural development. Also highlighted are references to the ecological, economic and social dimensions of sustainable agriculture and rural development. The fourth offers a list of websites that deal with sustainable development, with emphasis on agriculture and rural development. The sites are divided into three categories. 1) international institutions and organisations; 2) national agencies and ministries; 3) non-governmental organisations.

6. Final remarks and future developments

This study report offers a first attempt at assessing the sustainability of Italian agriculture, using a set of indicators that allow for simultaneous assessment of social, economic and environmental aspects. This set of indicators is put together in such a way as to be flexible and modifiable as changes occur in society's values and policy priorities, and as knowledge expands.

The indicators are a tool for monitoring and assessing sustainable development, making it possible to: a) verify whether patterns of economic activity are likely to satisfy sustainability objectives; b) point out trade-offs among economic, social and environmental dimensions, and among sectors of the economy.

Efficient use of this tool in the decision-making process requires however that the value of each indicator be compared with predefined values, like thresholds, standards and targets. Such comparison, indeed, allows interpretation in the light of predefined objectives. As regards the problem of interpretation and adoption of the indicators in specific cases, it is crucial to identify the conditions necessary and sufficient for sustainability, beginning with a definition of sustainability criteria for each of the three dimensions, economic, social and environmental. Simultaneous assessment of progress in all three dimensions provides a view of the full picture.

Table 2 shows an initial schematic assessment of the indicators, based primarily on their progress.

Table 2 - Schematic assessment of indicators by geographical area

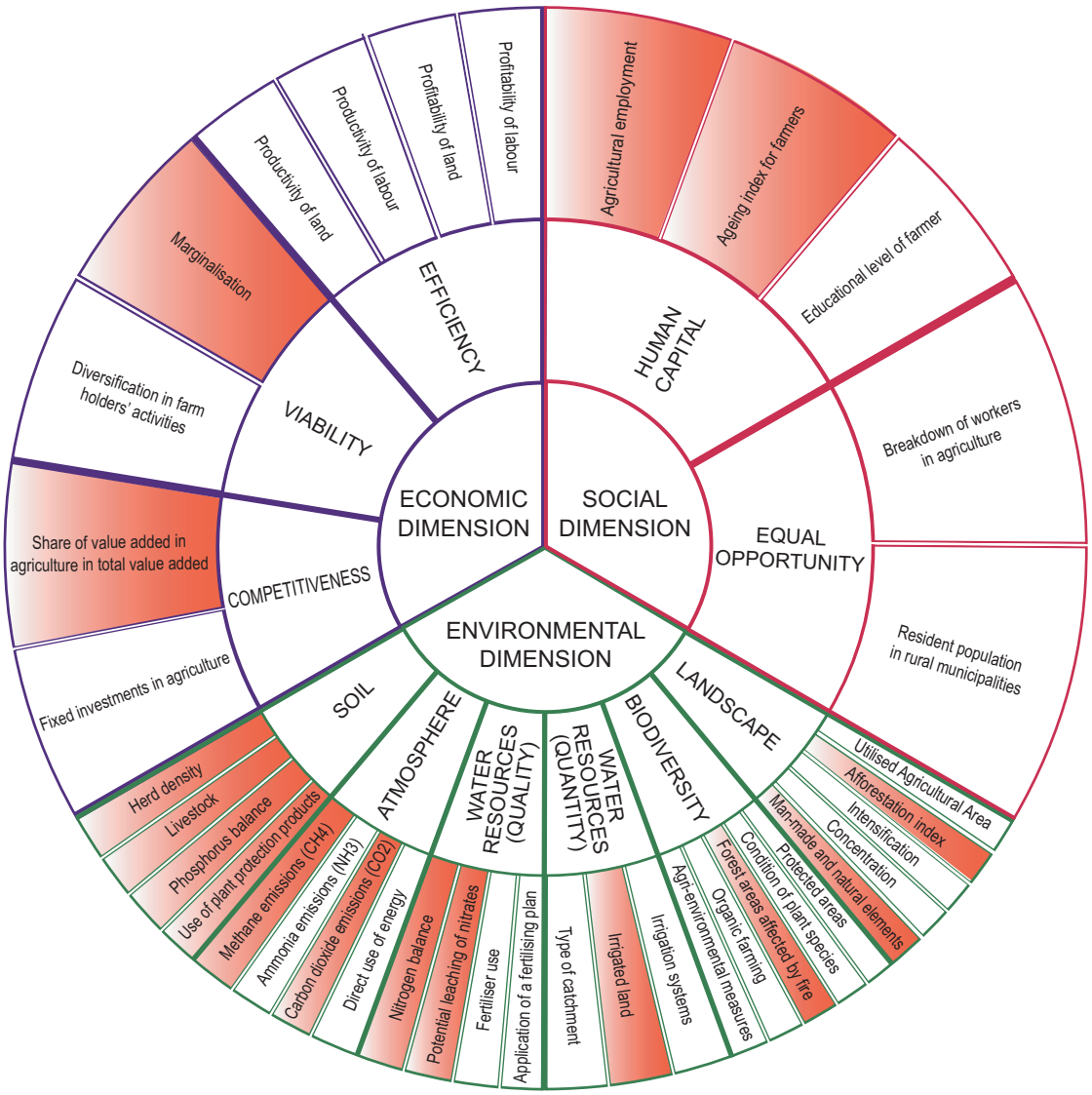
SOCIAL DIMENSION	North-West	North-East	Centre	South & Islands	Italy
1 Agricultural employment	☹	☹	☹	☹	☹
2 Ageing index for farmers	☺	☹	☹	☹	☹
3 Educational level of farmers	☹	☺	☺	☹	☺
4 Breakdown of workers in agriculture	☺	☺	😐	😐	☺
5 Resident population in rural municipalities	😐	😐	😐	😐	😐
ECONOMIC DIMENSION	**North-West**	**North-East**	**Centre**	**South & Islands**	**Italy**
6 Profitability of labour	☺	☺	☺	☺	☺
7 Profitability of land	☺	☺	☺	☺	☺
8 Productivity of labour	☺	☺	☺	☺	☺
9 Productivity of land	☺	☺	☺	☺	☺
10 Marginalisation	☹	☹	☹	☹	☹
11 Diversification in farm holders' activities	☺	☺	☺	☺	☺
12 Share of agricultural value added in total value added	☹	☹	☹	☹	☹
13 Fixed investments in agriculture	☺	☺	😐	😐	☺
ENVIRONMENTAL DIMENSION	**North-West**	**North-East**	**Centre**	**South & Islands**	**Italy**
14 Herd density	☹	☹	😐	☹	☹
15 Livestock	☹	☹	☹	😐	☹
16 Phosphorus balance	☹	☹	☹	☹	☹
17 Use of plant protection products	☹	☹	☹	☹	☹
18 Methane emissions (CH_4)	☹	☺	☹	☹	☹
19 Ammonia emissions (NH_3)	☺	☺	☺	☺	☺
20 Carbon dioxide emissions (CO_2)	☹	☹	☹	☹	☹
21 Direct use of energy	☺	n.d.	☹	☺	☺
22 Nitrogen balance	☹	☹	☺	☹	☹
23 Potential leaching of nitrates	☹	☹	☹	☹	☹
24 Fertiliser use	☺	☺	☹	☹	😐
25 Application of a fertilising plan	☺	☺	☺	☺	☺
26 Irrigation systems	☺	☺	☺	☺	☺
27 Irrigated land	☹	☹	☹	☹	☹
28 Type of catchment	n.d.	n.d.	n.d.	☹	n.d.
29 Protected areas	☺	☺	☺	☺	☺
30 Condition of plant species	–	–	–	–	–
31 Wooded land affected by fire	☹	😐	☹	☹	☹
32 Organic farming	☺	☺	☺	☺	☺
33 Agri-environmental measures	☺	☺	☺	☺	☺
34 Utilised Agricultural Area	☹	☹	☹	☹	☹
35 Afforestation index	☺	☺	☺	☺	☺
36 Intensification	☺	☺	☺	☺	☺
37 Concentration	☹	☹	☹	☺	☹
38 Man-made and natural elements	☺	☺	☺	☹	☺

The selection of indicators, as is often the case, was affected by the availability of data. Nonetheless, in our case it was possible to cover all dimensions equally, ensuring a complete overall view. This does not exclude the advisability of making further investigation of some issues particularly inherent to the social (equal opportunity, for example) and environmental dimensions

(landscape, biodiversity).
The aggregation of indicators to reach a summary representation of sustainability is a complex task, but it is necessary for encouraging inclusion of the objective of sustainability within the process of forming and enacting public policy. Aggregation is a way of simplifying information to make it easy to use in policy decision-making, which normally requires support tools that are concise and easy to understand.
In this study we have pursued this purpose. Still, it should be pointed out that in the case of the indicators we propose, the search for synthesis should be pursued with caution. Indeed, with indicators of sustainability, using compensatory methods of aggregation (e.g. weighting means) may generate biases in information.
Therefore a possible solution could be to adopt a tool for reading and summarising indicators, which would retain information potential intact. The "dashboard" method[11], which uses the metaphor of a vehicle's instrument panel in terms of sustainability, seems to meet this requisite. Indeed, it allows for managing and controlling the set of indicators, and overcomes the problem of calculations on indicators that would introduce further subjectivity into the assessment process. The dashboard also provides an efficient representation of the complexity of the issue of sustainability (see Figure 2) and the impossibility of providing a univocal assessment.
The dashboard gives a simultaneous view of "degree of sustainability" for: a) all the dimensions; b) each dimension; c) each theme within the dimensions; d) each indicator, making it possible to analyse sustainability according to different levels of aggregation. It is also possible to develop an analysis in different geographical categories (e.g. administrative region, municipality, etc.).
It is important to emphasise that the dashboard approach also requires identifying: 1) priority objectives for the economy, the environment and social issues, based on values and objectives of the public; 2) thresholds and target values for each indicator. The former, mainly associated with policy decisions, are useful for setting the relative importance (and possibly the weight) of the various issues of sustainability and related indicators. The latter are generally suggested by the world of science; they are useful for interpreting the direction of certain developments and trends, according to the distance-to-target method. This is especially true when referring to the environment; its irreversibility, and our uncertainty and widespread ignorance of its characteristics, require precautionary behaviour in defining and interpreting indicators.

[11] This approach, proposed by the IISD/Consultative Group on Sustainable Development Indicators, "using the metaphor of a vehicle's instrument panel, (…) displays country-specific assessments of economic, environmental, social and institutional performance toward (or away from) sustainability" (http://www.iisd.org/cgsdi/dashboard.htm). See also U.S. Interagency Working Group on Sustainable Development Indicators, 1998.

Figure 2 - The dashboard of sustainability



Note:

Indicators highlighted in red show a situation of "alert". This warns of the need to make opportune verifications of sustainability within the areas indicated.

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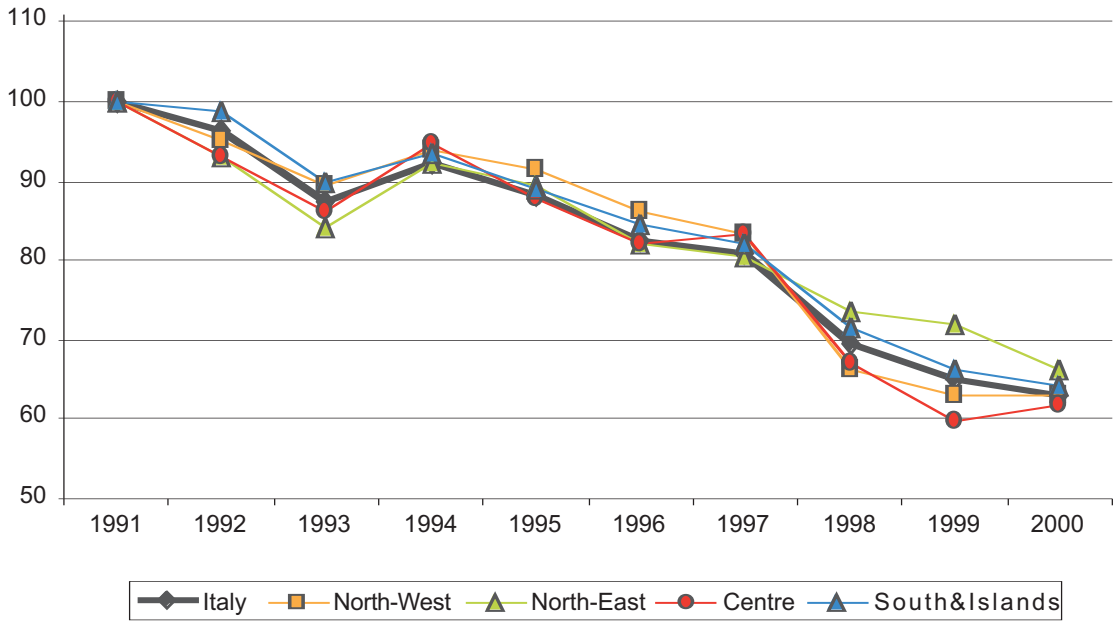
INDICATORS
OF SUSTAINABILITY

1. Agricultural employment

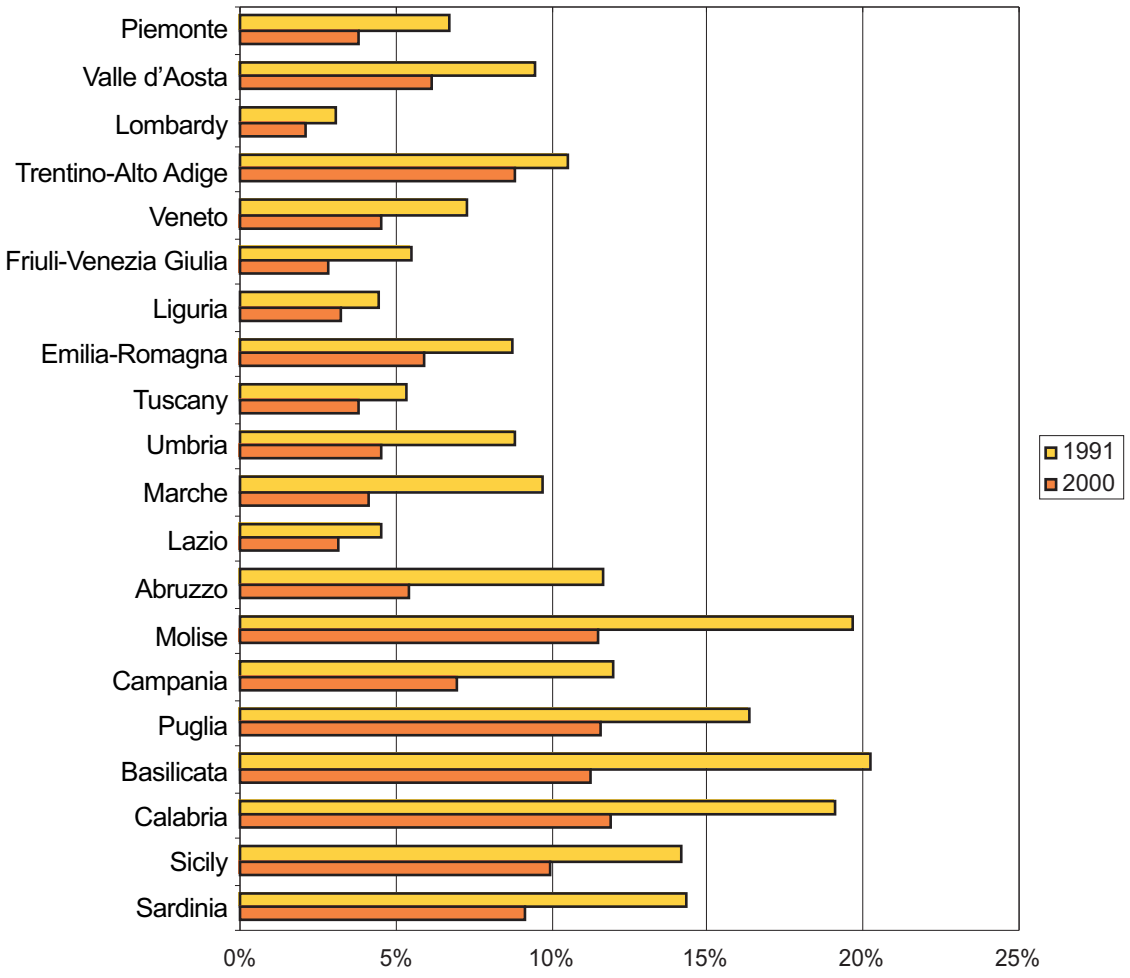
The number of people employed in agriculture contributes to preserving the viability of rural areas, as well as of the sector itself. Economic interpretation of the progress of this indicator must be made in consideration of its relationship to the indicator for work productivity. A decline in labour may in fact be related to an increase in productivity.

In the industrialised countries generally, a negative trend can be observed in the number of people employed in agriculture, both in totals and compared to other sectors. In Italy, the agriculture sector occupies a total of approximately 1,120,000 persons, with 14% in the Centre, 37% in the North and 50% in the South & Islands. Between 1991 and 2000, the number of people employed in agriculture decreased by 4.5%, dropping on average from around 8% to 5% of total labourers. The development in this variable is similar in all geographical areas, though in the South & Islands farm labourers account for 9.3%, nearly twice those in the North (5.7%), and more than three times those in the North-West (2.7%). On the regional level, the greatest decline was in Marche (-8.2%), Abruzzo (-7.3%) and Umbria (-6.5%).

Agricultural employment (1991 = 100)



Agricultural employment



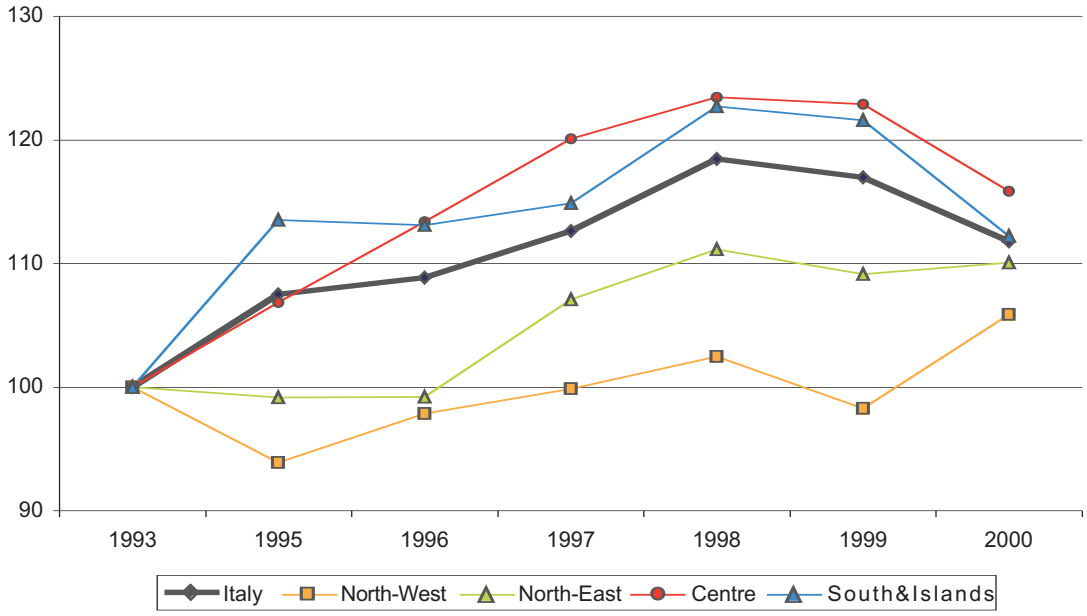
North-West	North-East	Centre	South & Islands	Italy
☹	☹	☹	☹	☹

2. Ageing index for farmers

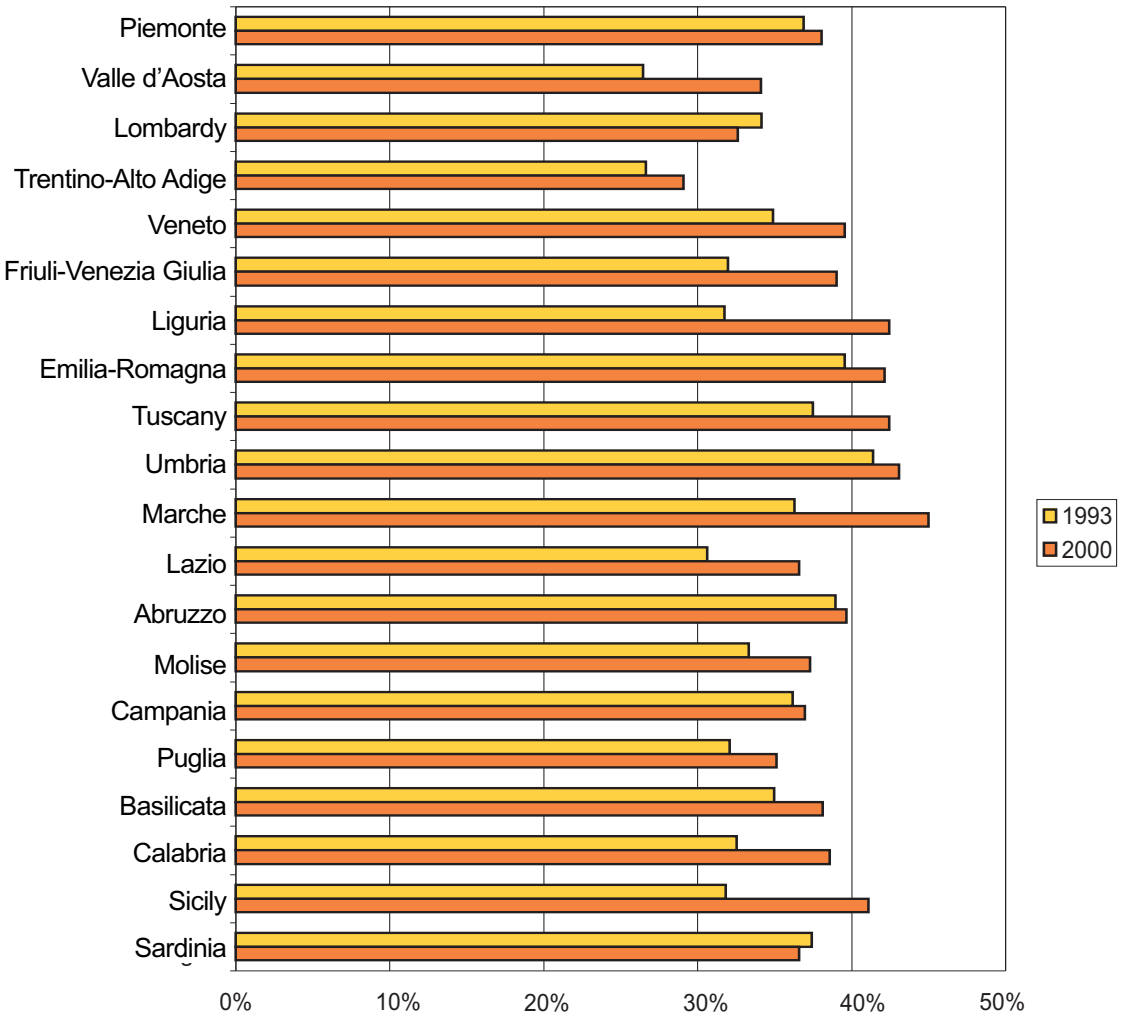
Young farmers are an essential element for development and viability in rural areas. Compared to older farmers, they show a greater tendency toward introducing technological innovation, and adapt more quickly to regulatory, economic and environmental changes. Young people also contribute to the viability of rural areas and consequently to the protection and stewardship of land and natural space. This contributes to a better balance within the economy-environment-society system. On a regulatory level, a legislative frame of reference exists which is geared toward providing incentives for young farmers to take the place of their older counterparts (EC Reg. 1783/2003; EC Reg. 1257/99).

Between 1993 and 2000, the ageing index increased on average nationwide from 34 to 38%. The greatest increase occurred in the central regions (from 34% to 40%) and those of the North-East (from 35% to 38%). Liguria, Sicily and Valle d'Aosta showed the greatest rates of increase, whereas the percentage of older farmers declined in Sardinia and Lombardy. Regions in the Centre averaged a relatively higher number of farms run by older farmers.

Ageing index (1993 = 100)



Ageing index



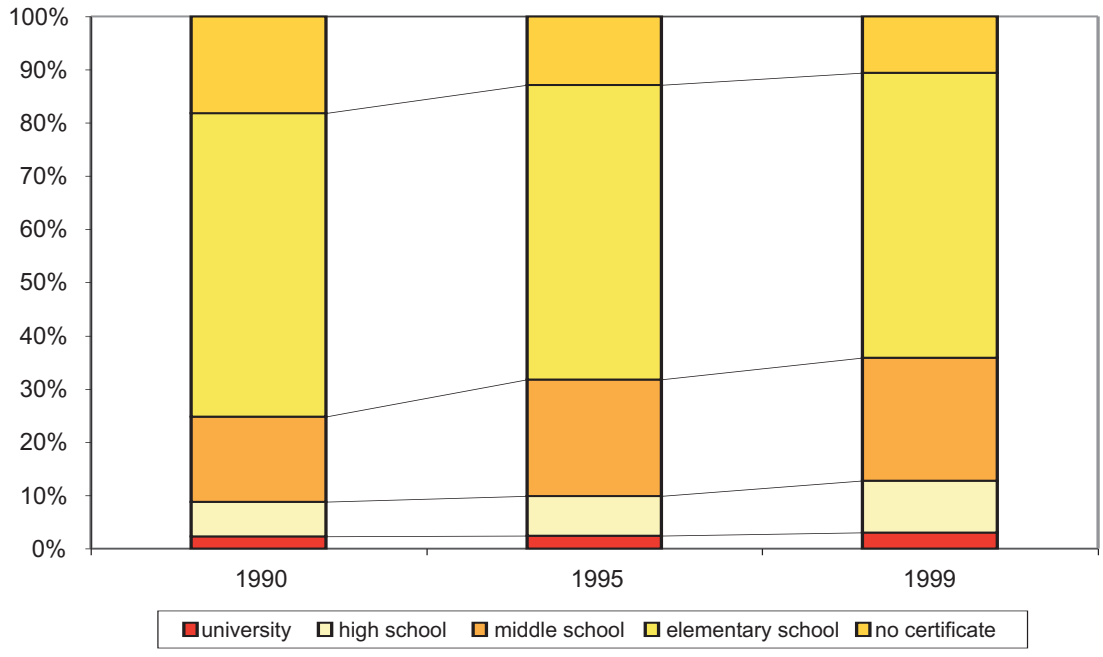
North-West	North-East	Centre	South & Islands	Italy
☺	☹	☹	☹	☹

3. Educational level of farmers

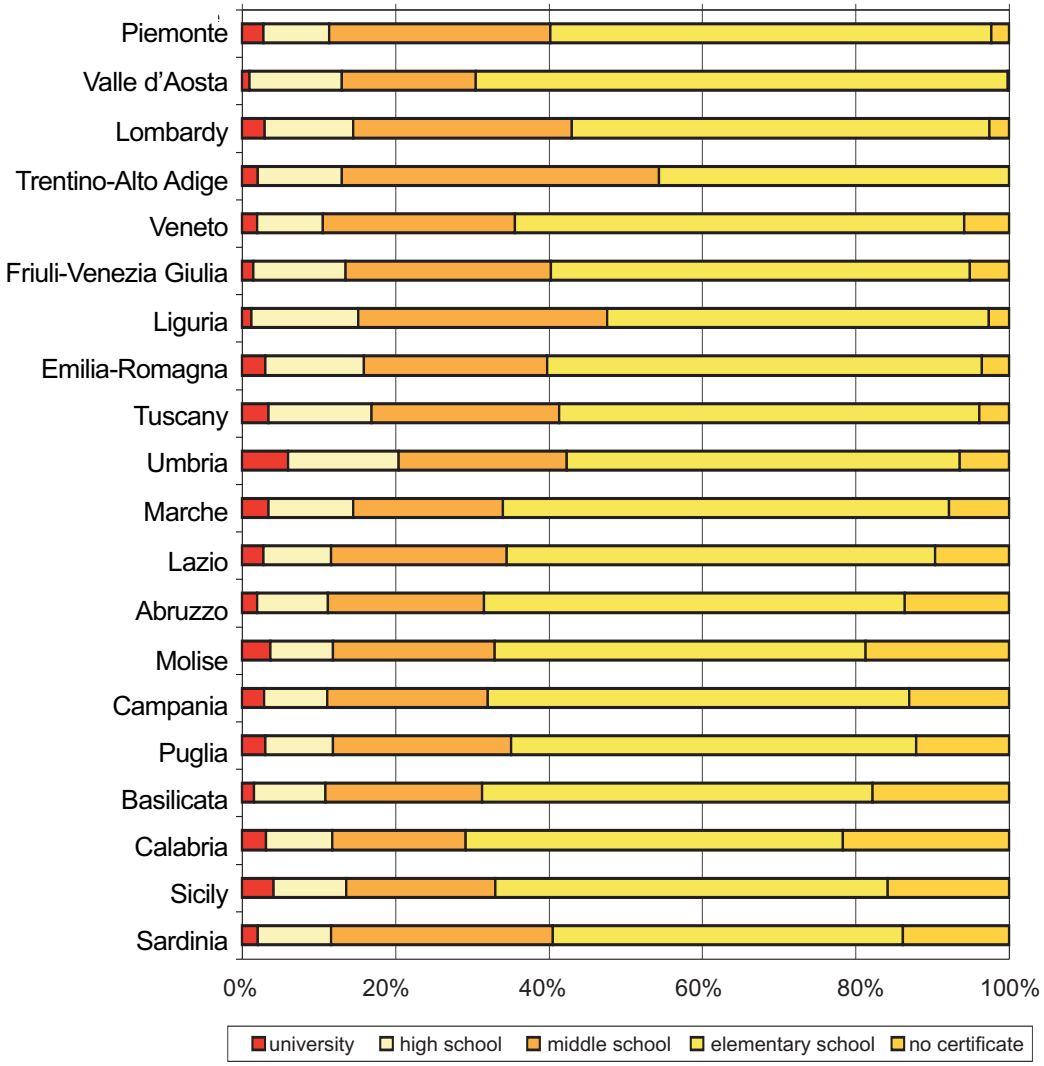
A higher level of education can generally be associated with a greater tendency among farmers to adopt technological innovations that may contribute to improving farms' environmental performance, improve working conditions and product quality, and increase productivity.

As far as the trend in educational level is concerned, between 1995 and 1999 this indicator showed a slight improvement: in fact, there was an increase in farm holders with high school diplomas and those with middle school certificates; there was a decline, however, among farmers with no formal education certificate and those with an elementary school education. The number of university graduates remained practically the same (3% in 1999). There was also an improvement in educational level among farm holders by individual geographical area and region. In general, more farmers in the South and Islands had elementary school certificates, while more in the North held secondary school certification.

Educational level of farmers in Italy



Educational level of farmers (1999)



North-West	North-East	Centre	South & Islands	Italy
☹	☺	☺	☹	☺

4. Breakdown of workers in agriculture

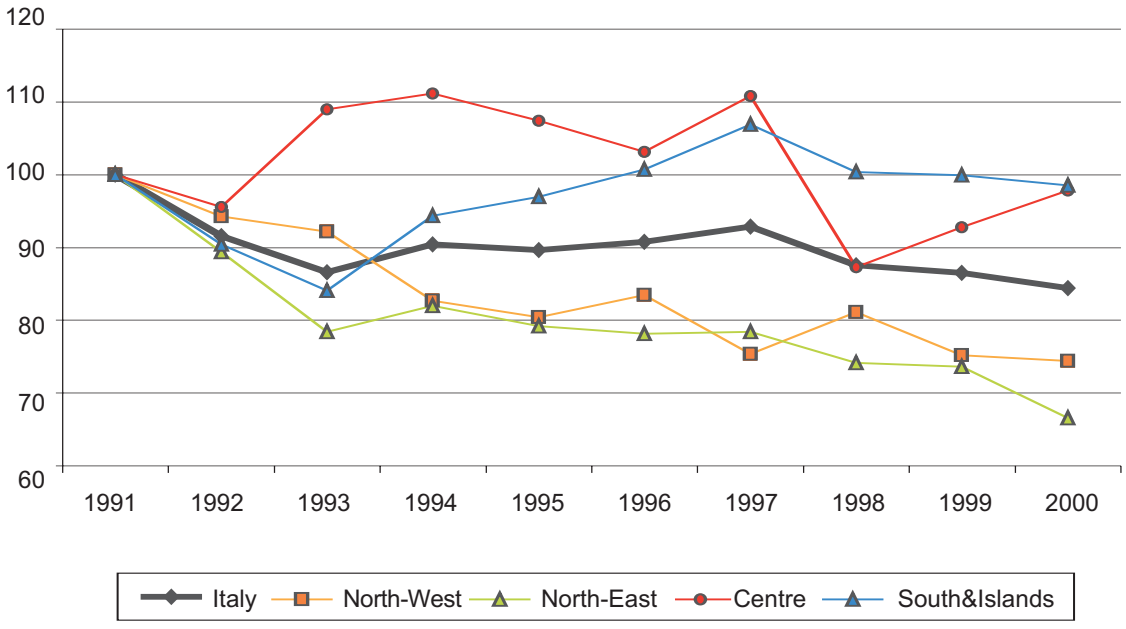
This indicator, together with the ageing index, provides a description of the characteristics and potential of human resources employed in agriculture over the medium to long period. The reduced gap between the sexes in labour helps to ensure more equal opportunity within the sector.

Between 1991 and 2000, females in agriculture increased nationwide, and the difference between the number of males and females decreased. This phenomenon was more marked in the North, especially the North-

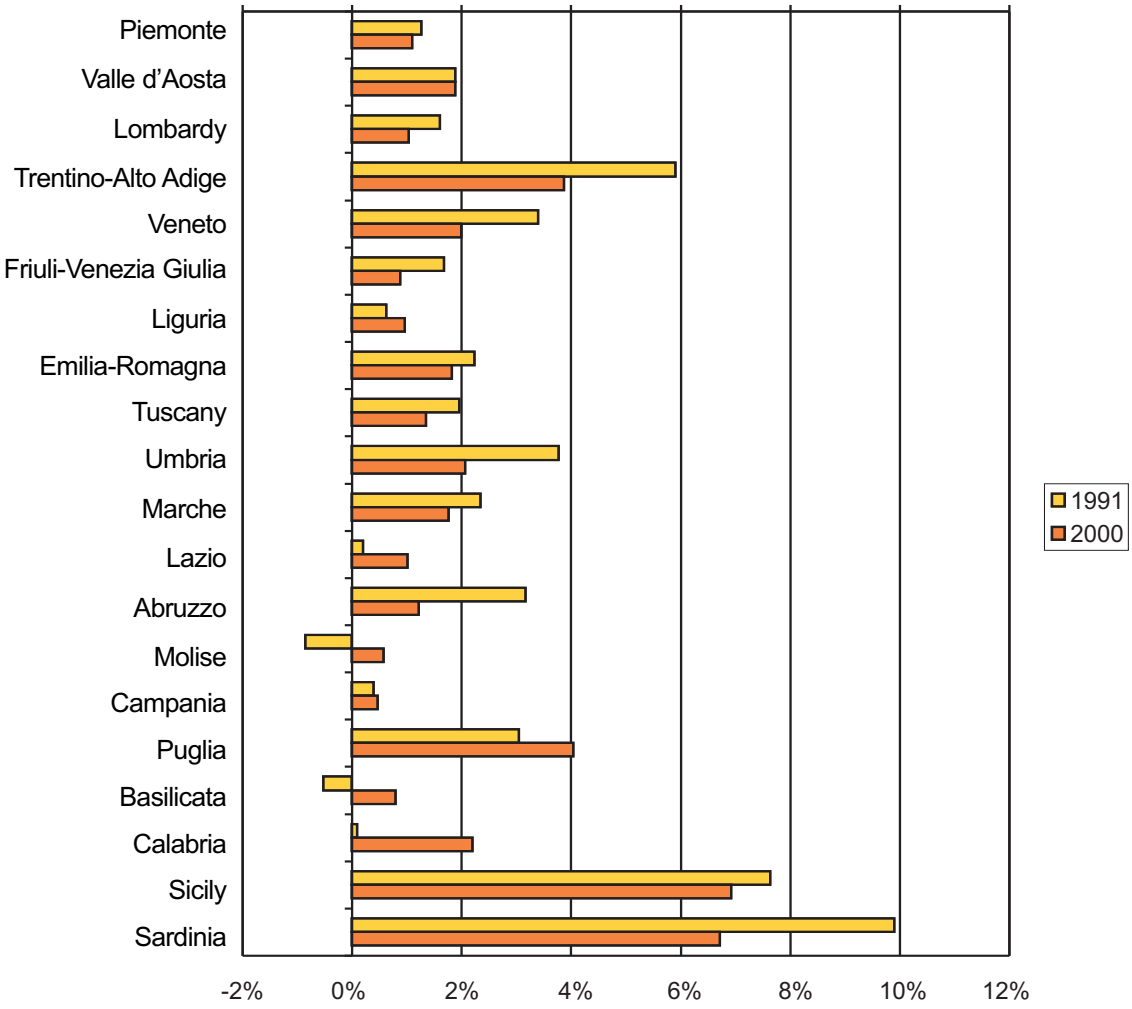
West, where the difference dropped from 3% to 2%. But the divergence between males and females remained stable in the Centre and South and Islands. This last area also registered a higher percentage of male workers.

Difference between male and female workers in agriculture

(1991=100)



Difference between male and female workers in agriculture



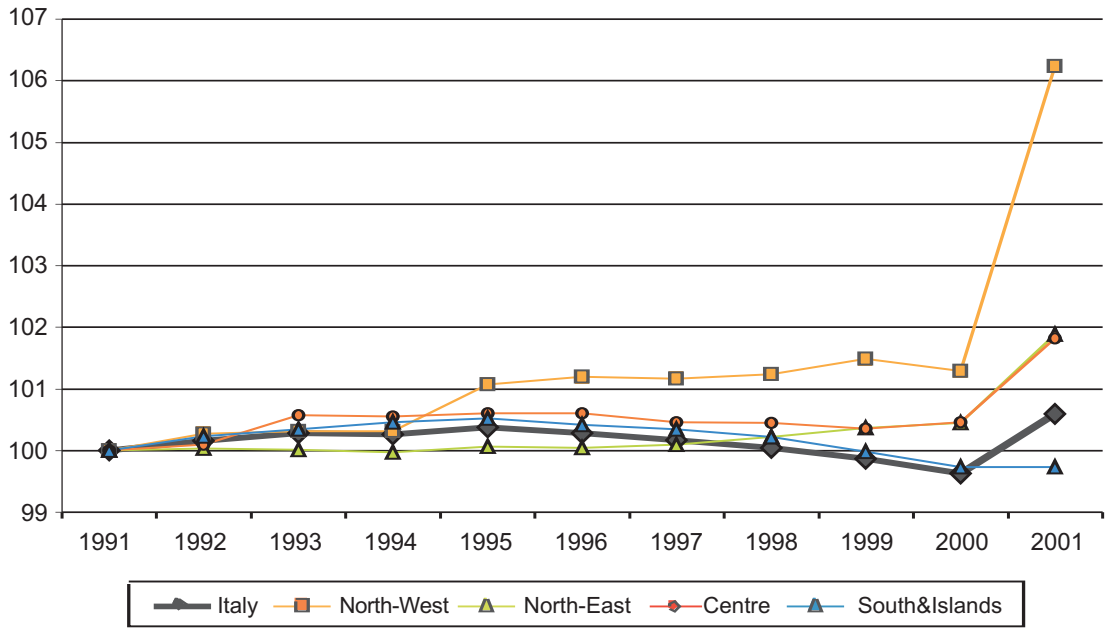
North-West	North-East	Centre	South & Islands	Italy
☺	☺	😐	😐	☺

5. Resident population in rural municipalities

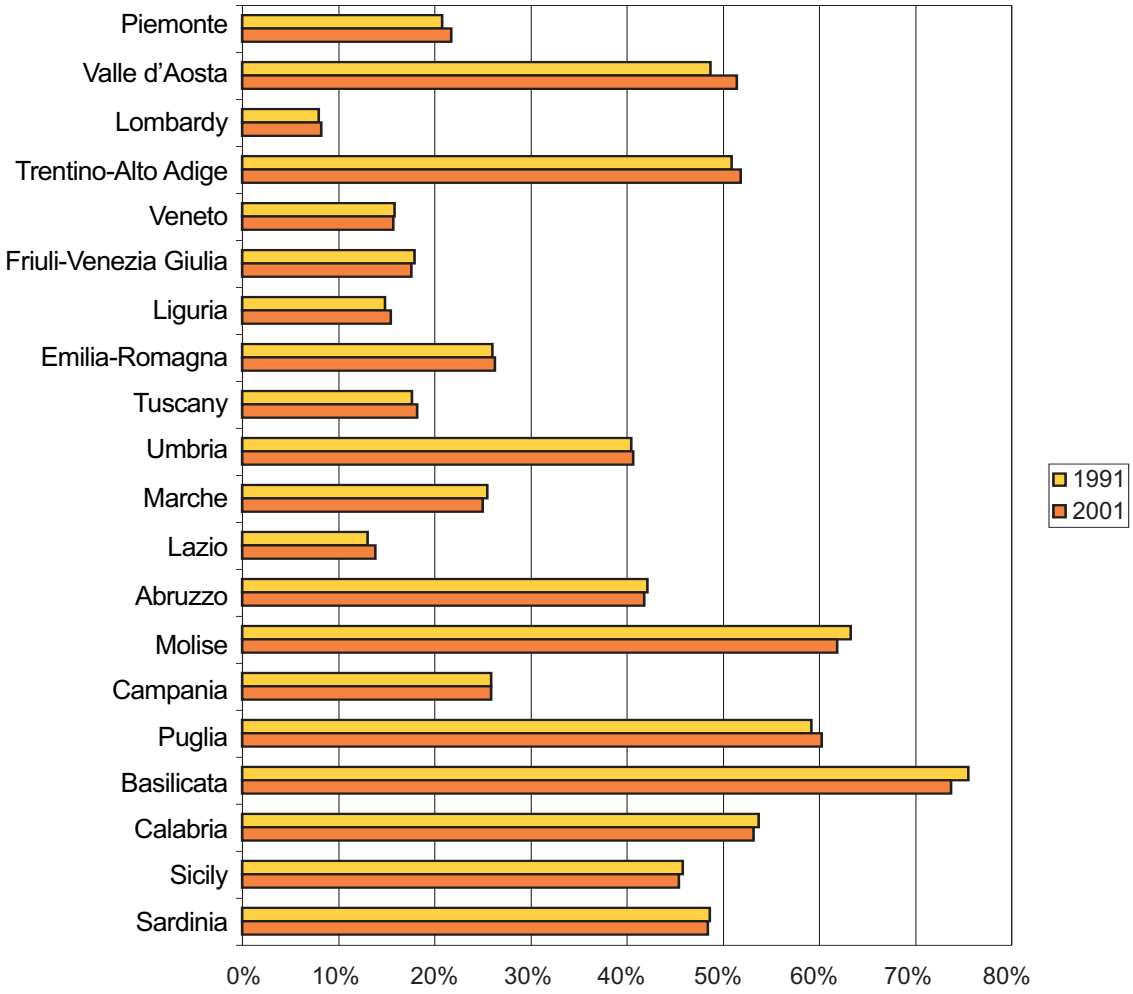
Maintaining population in rural areas is a social objective; meeting it depends largely on living conditions (work opportunity, availability of services). The abandonment of these areas may cause problems of degradation, both economically and environmentally.

Between 1991 and 2000, the resident population in rural areas nationwide remained substantially the same, with a slight tendency toward growth. But rural municipalities of the South and Islands, and to a lesser degree in the Centre, showed a tendency toward decline. Increases in population in rural municipalities are partly attributable to recent phenomena of counter-urbanisation prevalent near large urban centres.

Resident population in rural municipalities in Italy (1991=100)



Resident population in rural municipalities



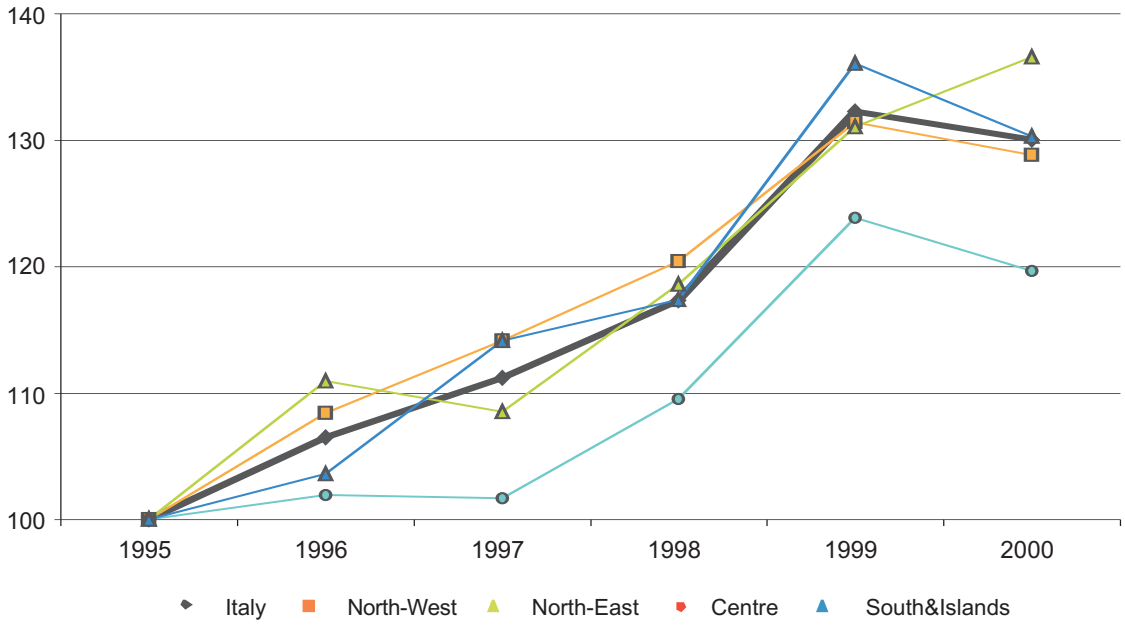
North-West	North-East	Centre	South & Islands	Italy
😐	😐	😐	😐	😐

6. Profitability of labour

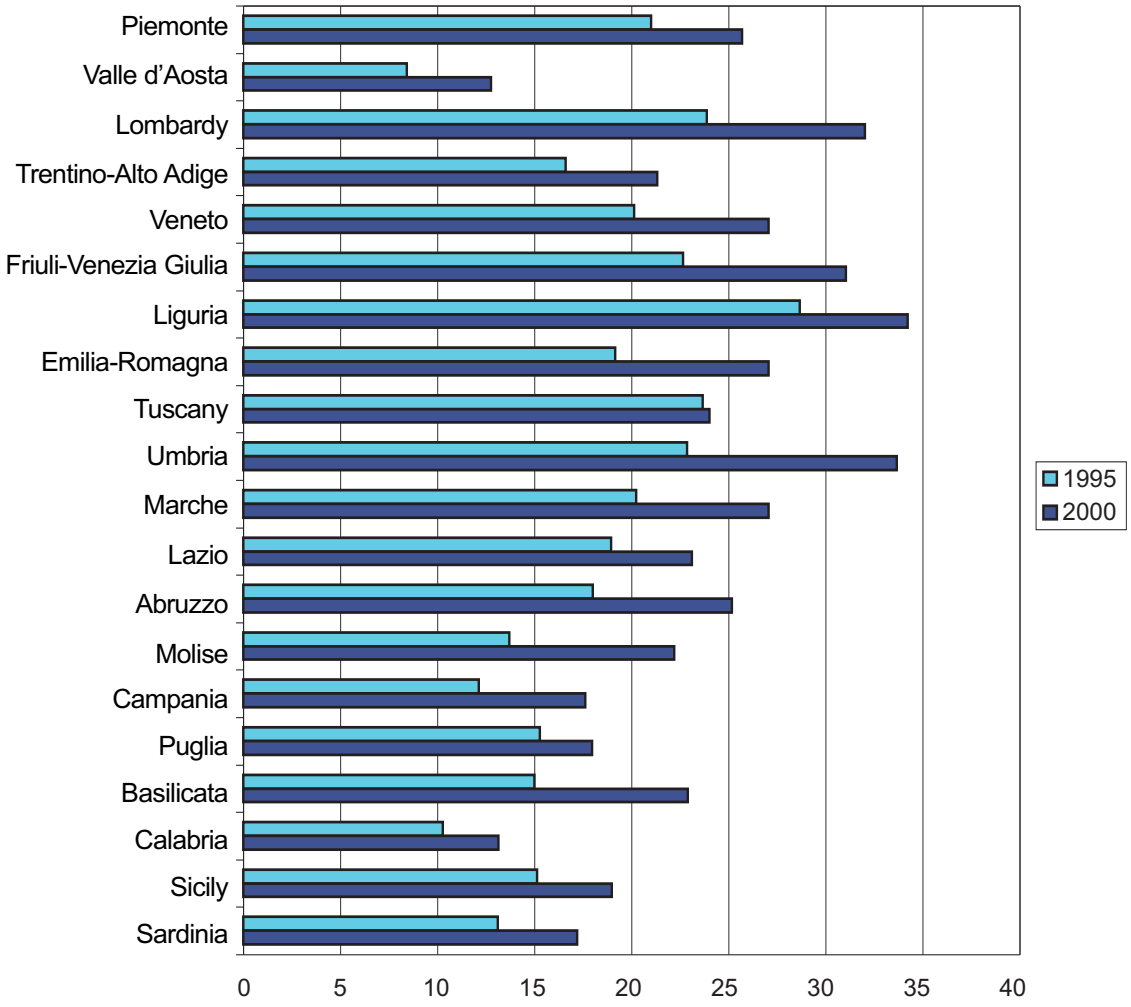
This indicator, along with that for value added per hectare of UAA, measures the profitability of the agriculture sector, or its capacity to remunerate input factors employed. Only if the sector is competitive, and inputs used are adequately remunerated, can potential production be sustained in the long term.

Between 1995 and 2000, value added per work unit grew annually by 4.47%. Increases above the national average were seen in the regions of the North-West and the South and Islands, especially Molise, Basilicata and Campania. There was a lesser increase in central regions. In absolute terms, the highest values occurred in Liguria, Lombardy, Friuli Venezia Giulia, Emilia Romagna and Marche.

Profitability of labour (1995 = 100)



Profitability of labour ('000 eurolira 1995)



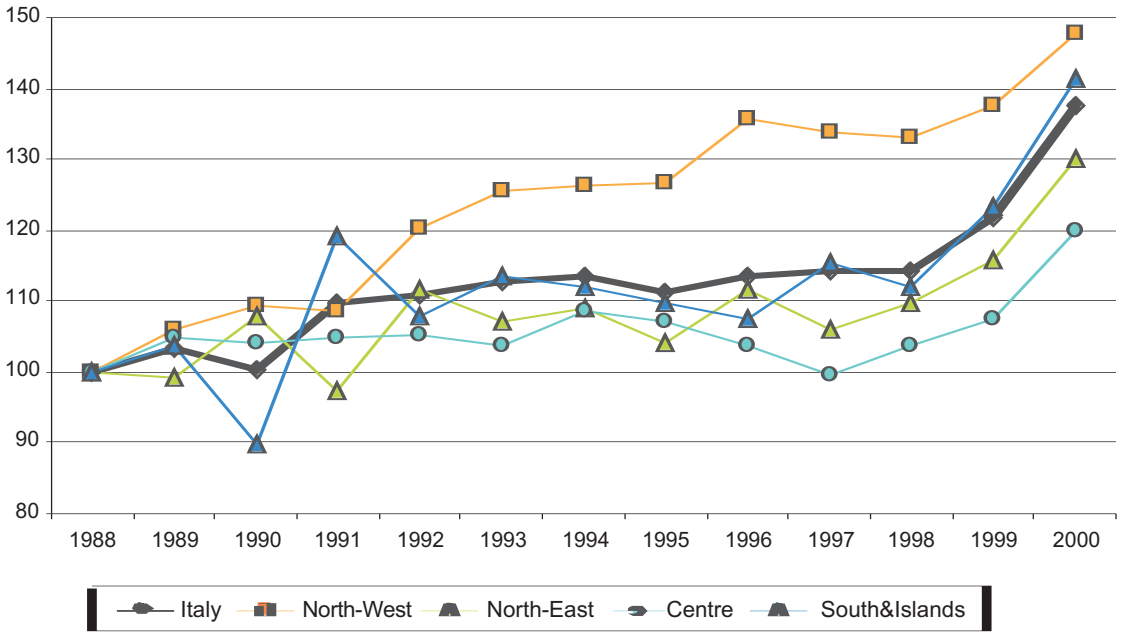
North-West	North-East	Centre	South & Islands	Italy
☺	☺	☺	☺	☺

7. Profitability of land

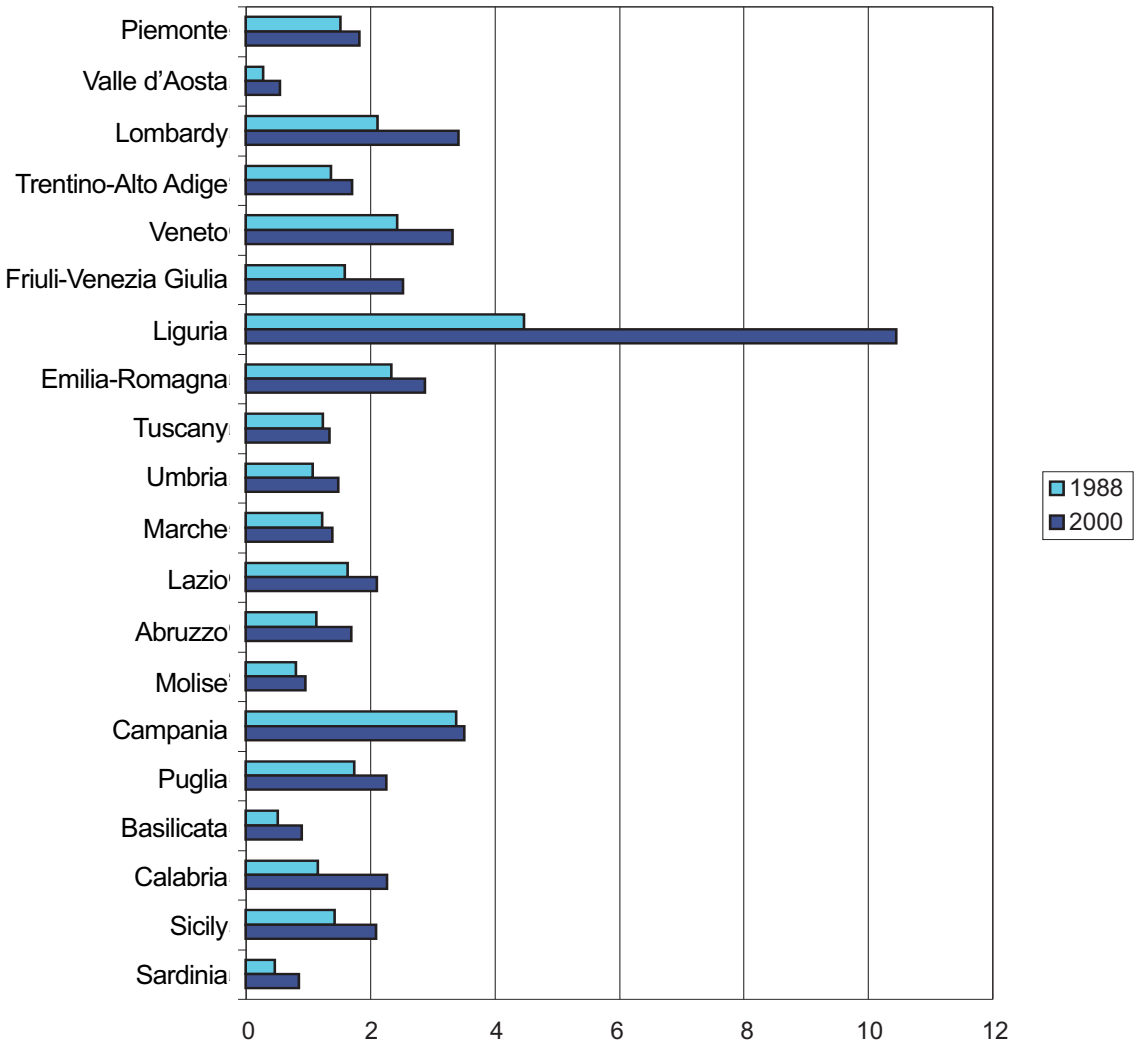
As with profitability of labour, here too the value added per hectare of UAA fits into the group of indicators for measuring productive efficiency. On a par with UAA, an increase in the value of this indicator in fact signals higher profitability of land.

Between 1998 and 2000, agricultural value added per hectare of UAA increased regularly, both in Italy as a whole and in all individual geographical areas. The increase in 2000 is due mainly to the reduction in UAA registered in the census. The highest growth occurred in the North-West (3%) and the South and Islands (2.7%). On a regional level, note should be made of the good performance of Liguria (6.7%), with the highest value added per hectare (10.5%), and Valle d'Aosta (5.4%) in the North (5.3%); and of Calabria (5.3%), Sardinia (4.7%) and Basilicata (4.5%) in the South and Islands.

Profitability of land (1988 = 100)



Profitability of land (‘000 di eurolira 1995)



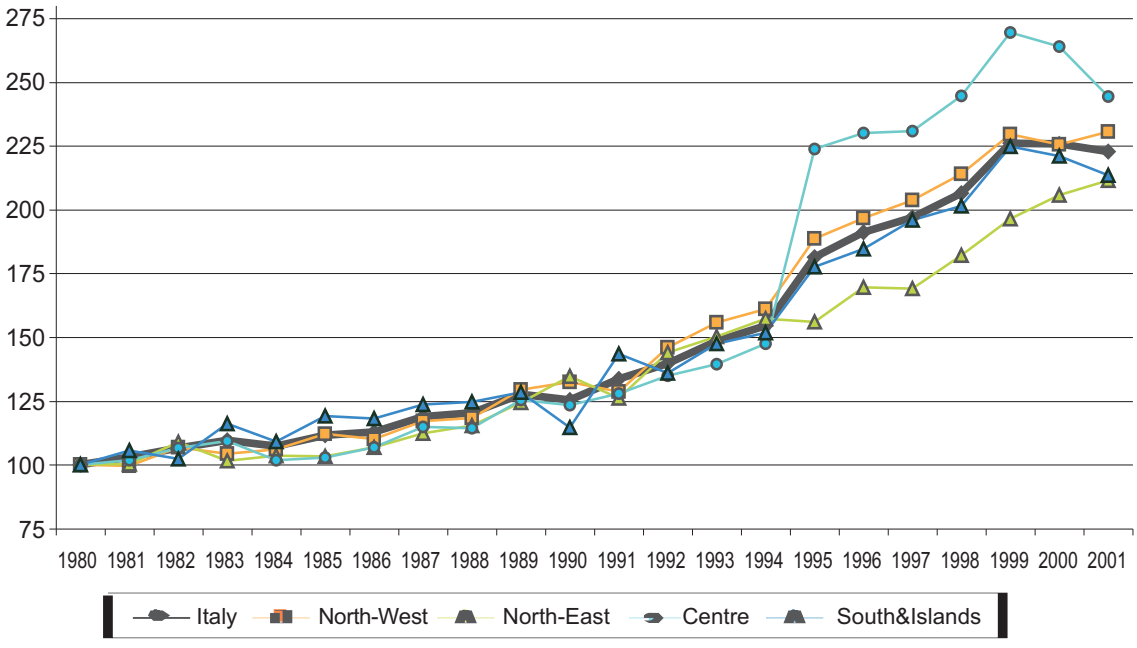
North-West	North-East	Centre	South & Islands	Italy
☺	☺	☺	☺	☺

8. Productivity of labour

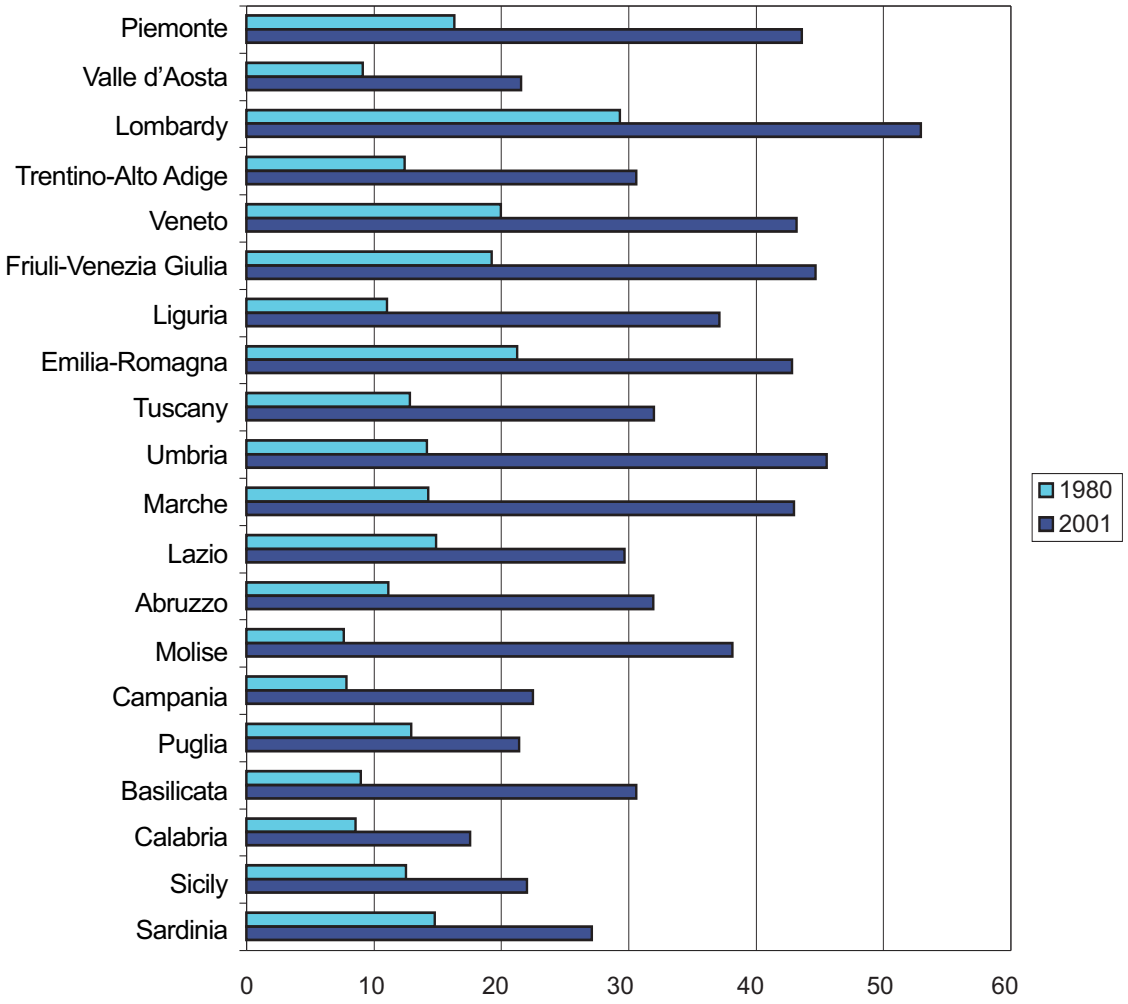
Productivity indicators provide a measurement of the efficiency with which agriculture converts inputs into outputs. Increased productivity shows that greater production can be obtained with the same quantity of inputs. Productivity of labour is one of the elements that provide information about economic prosperity. In general, if productivity of labour increases, potential production may be sustained over the long term, and/or future generations can produce more goods and services with a given amount of labour.

In the last twenty years, productivity of labour has grown steadily. From 1980 to 2000, there was an average annual growth of 3.7%. The greatest increase occurred in the regions of the Centre (Abruzzo and Basilicata in particular) and those of the North-East (especially Piemonte and Liguria).

Productivity of labour (1980=100)



Productivity of labour ('000 eurolira 1995)



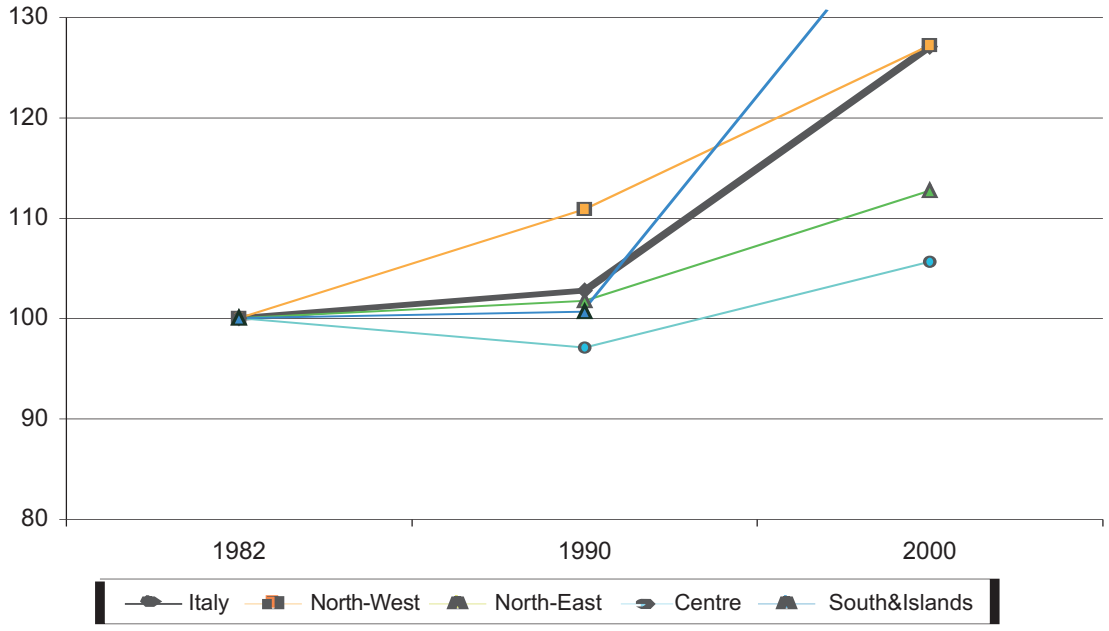
North-West	North-East	Centre	South & Islands	Italy
☺	☺	☺	☺	☺

9. Productivity of land

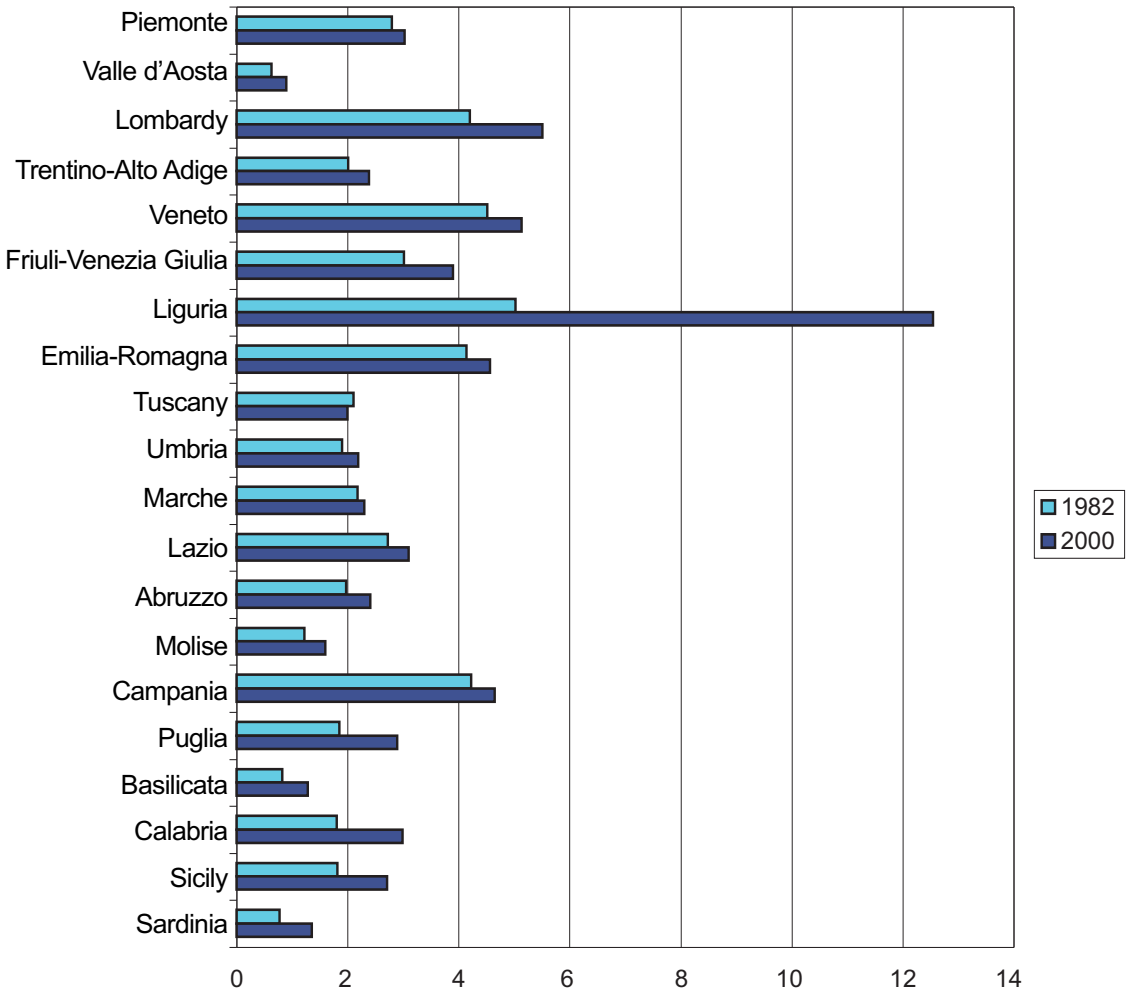
Productivity indicators provide a measurement of the efficiency with which agriculture converts inputs into outputs. Increased productivity shows that greater production can be obtained with the same amount of inputs.

Between 1982 and 2000, productivity of land increased annually by 1.3%, attributable both to an increase in gross saleable product and a significant decrease in utilised agricultural area registered in the last decade. The regions of the North-West, Liguria in particular, and the South and Islands, especially Sardinia and Calabria, showed the greatest increases.

Productivity of land (1982=100)



Productivity of land ('000 eurolira 1995))



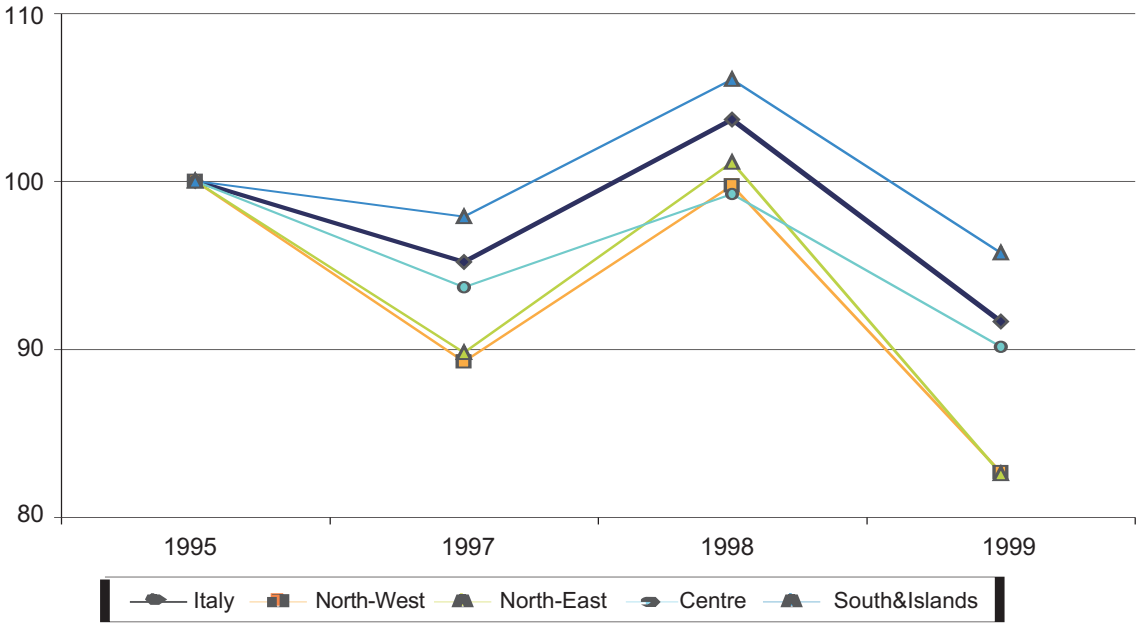
North-West	North-East	Centre	South & Islands	Italy
☺	☺	☺	☺	☺

10. Marginalisation

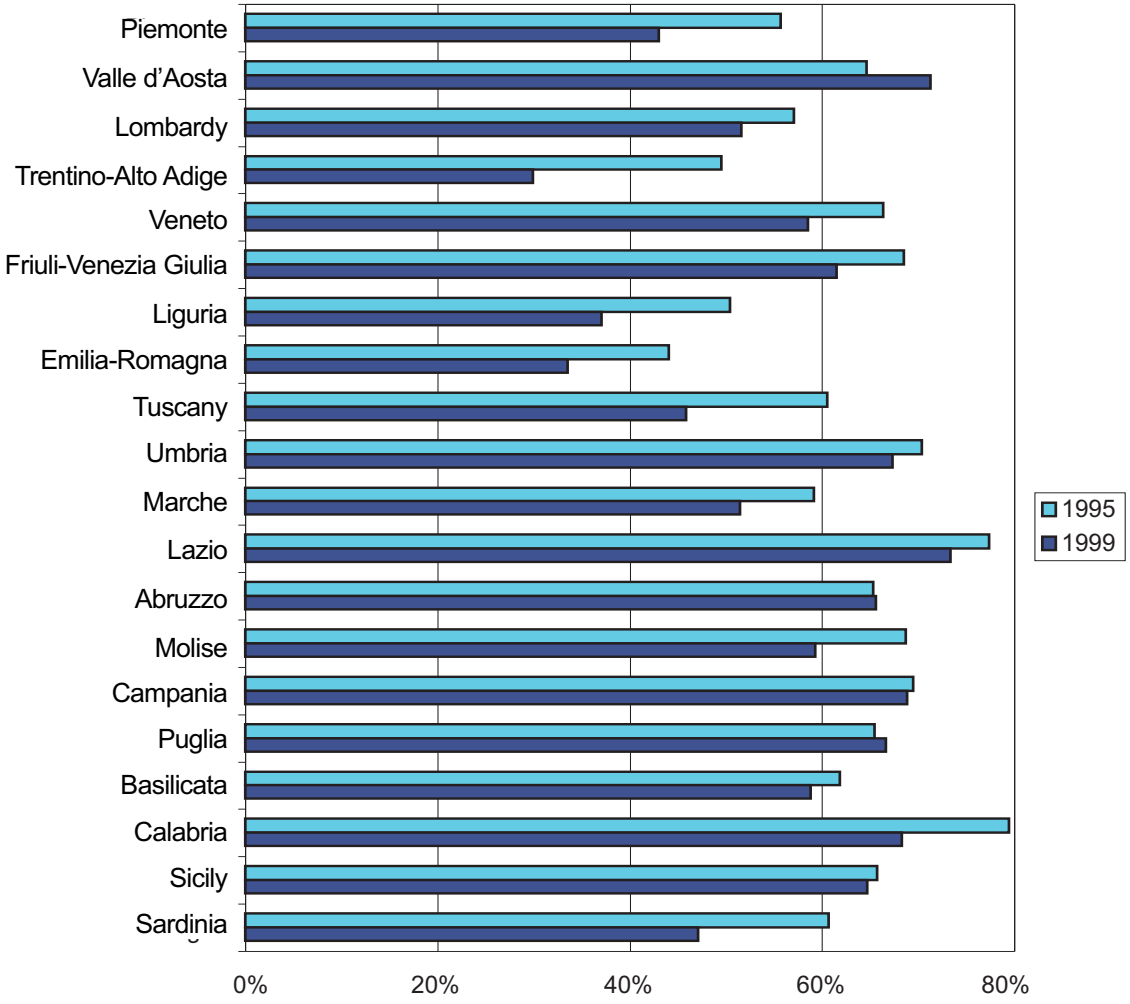
This indicator has to do with the growing incapacity of a farm to produce an acceptable income because of deterioration in its economic and/or physical environment. The direct consequence is an increased risk of closing down, which in turn leads to less protection of the land, potential loss of biodiversity and less landscape stewardship. This can produce negative effects overall, socially and environmentally. Still, from a merely economic point of view, the disappearance of small farms (economically and/or physically) is not a negative element in itself.

The reduction in numbers of small farms is a common phenomenon in many industrialised countries. In Italy, between 1995 and 1999, the number of small farms declined in absolute terms by approximately 500,000 units. In percentage terms, they dropped by six points, from 65% to 59%, with the most marked reductions in the North. The phenomenon is widespread in all regions except Valle d'Aosta, Abruzzo, Puglia, Campania and Sicily.

Marginalisation (1995= 100)



Marginalisation



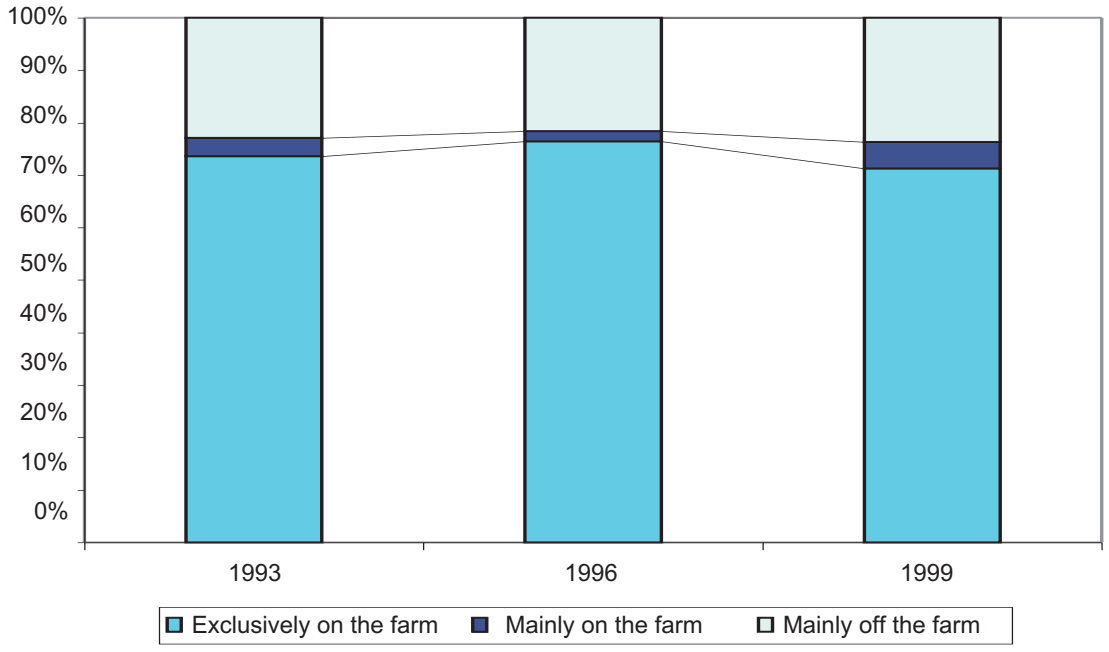
North-West	North-East	Centre	South & Islands	Italy
☹	☹	☹	☹	☹

11. Diversification in farm holders' activities

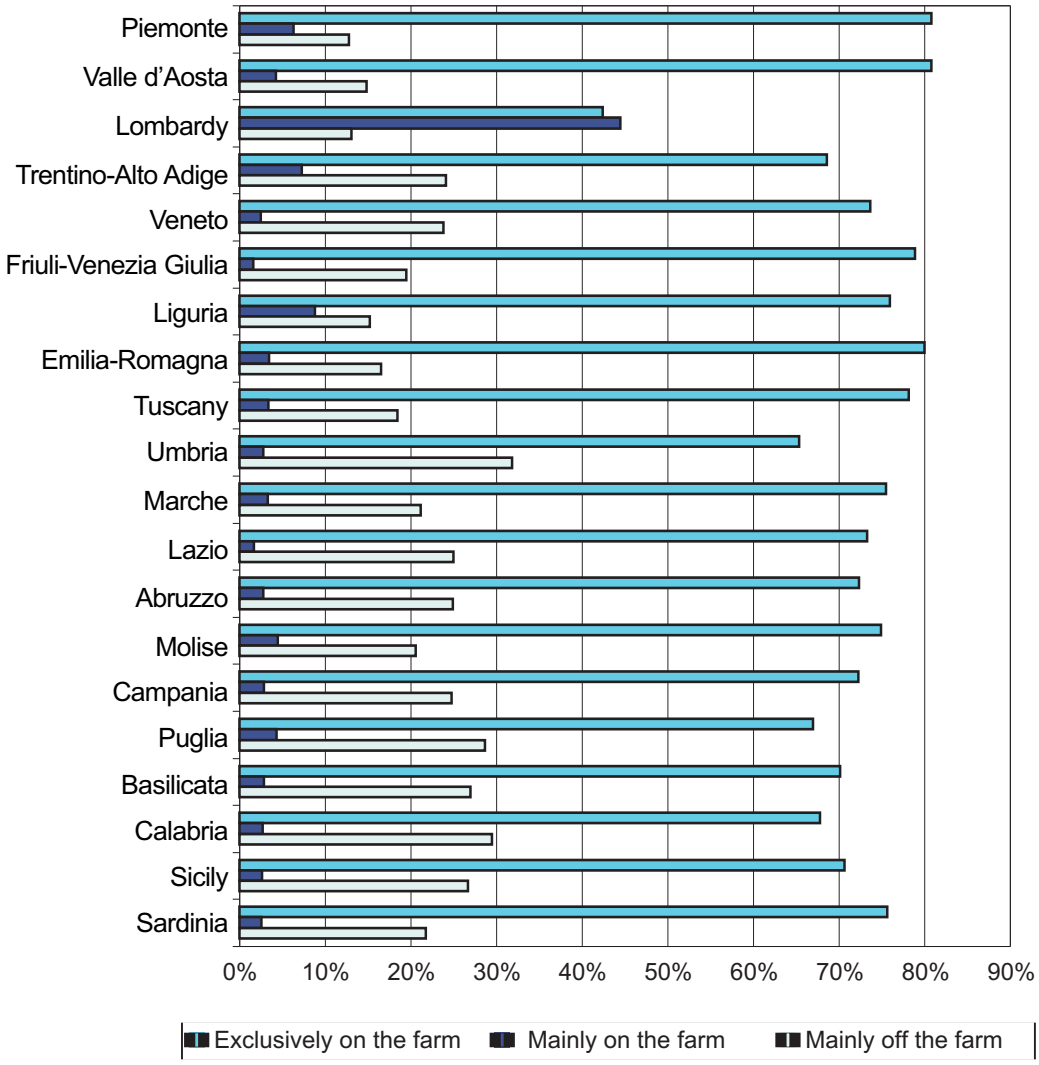
The percentage of farms classified by farm holders' activities provides a measurement of a farm's economic diversification: the higher the percentage of farms run by farm holders who diversify their activity, the greater the farms' economic viability. Diversification of activity is a medium-term strategy of risk management that may, however, reduce economic efficiency.

From 1993 to 1999, there was a general tendency among farm holders to increase the degree of diversification in their activities by taking on other work. The percentage of farm holders who worked "exclusively on the farm" dropped from 73.6% to 71.3%, whereas those who worked "mainly on the farm" rose from 3.6% to 5%, and those with activities "off the farm" increased from 22.8% to 23.6%. This national trend was reflected in all geographical areas with the exception of the North-West, where there was a particular increase in farm holders mainly employed on their farms. In all other areas, the trend followed the national average. Among the regions, Piemonte, Valle d'Aosta, Emilia Romagna and Tuscany showed the highest percentages of farms run by holders in the "exclusively on-farm" category.

Diversification in farm holders' activities in Italy



Diversification in farm holders' activities (1999)



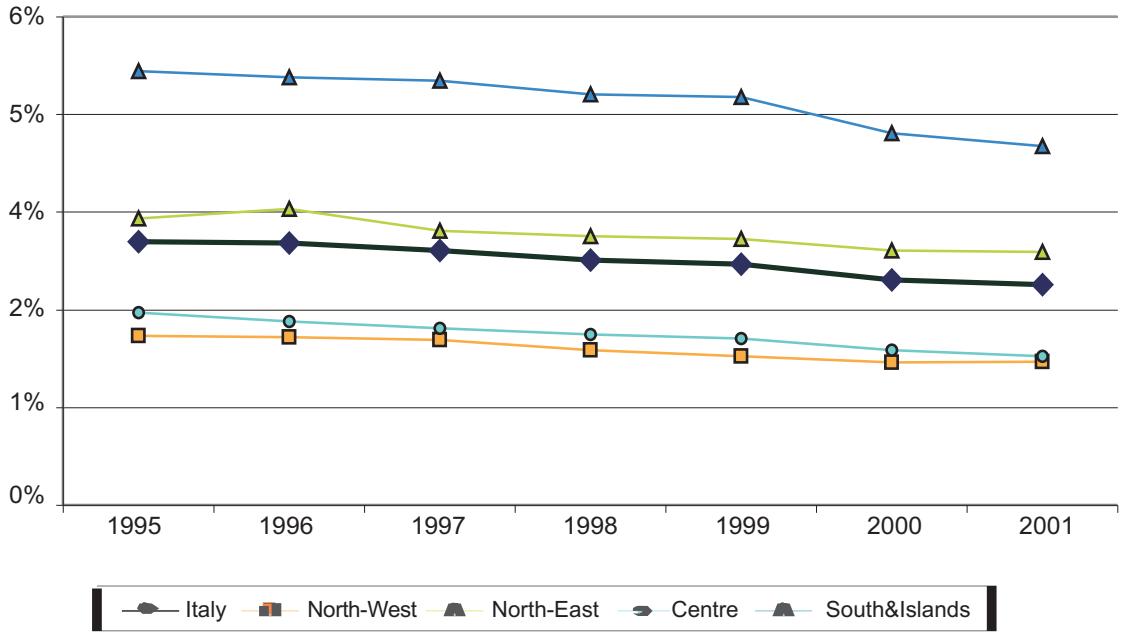
North-West	North-East	Centre	South & Islands	Italy
☺	☺	☺	☺	☺

12. Share of agricultural value added in total value added

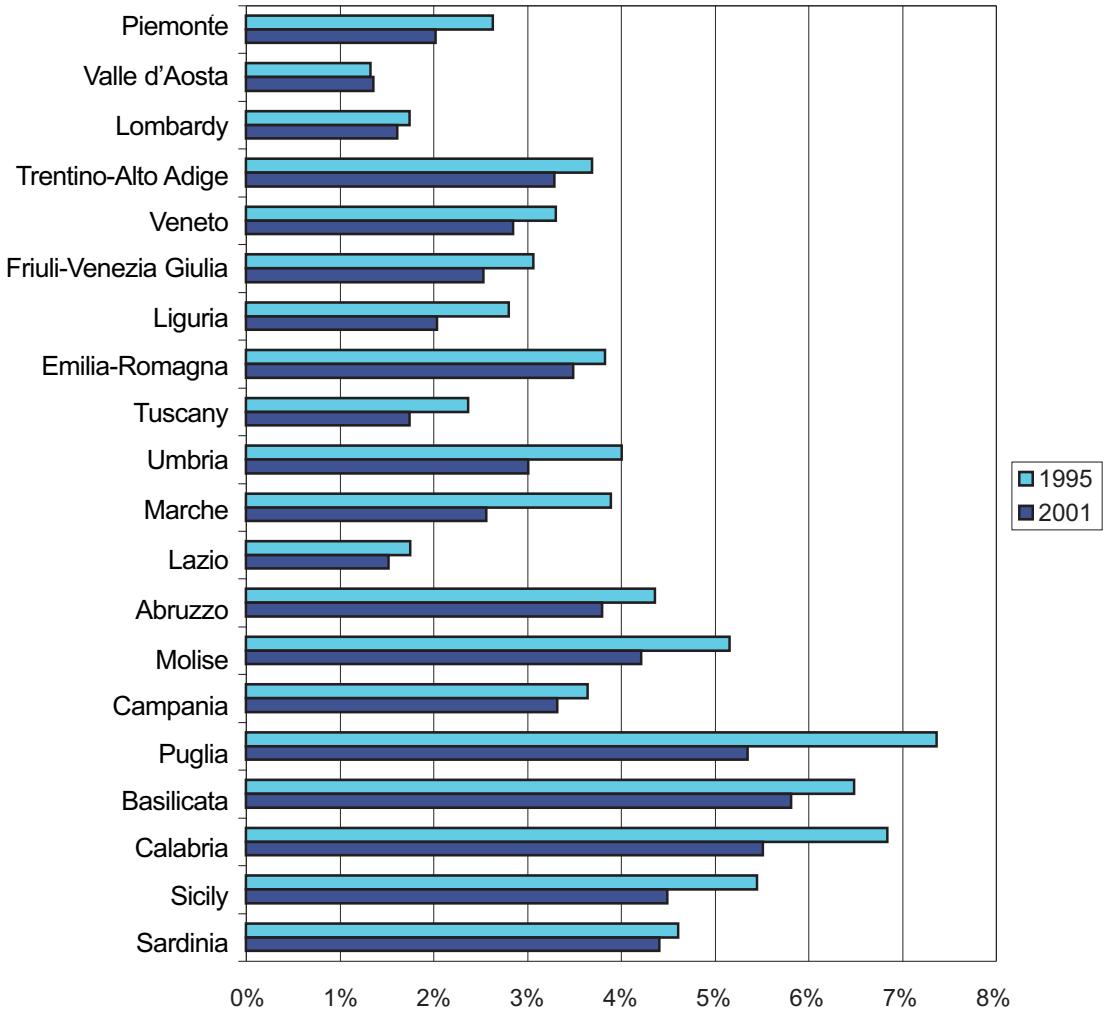
The contribution of the agriculture sector to national wealth provides indications about the sector's weight within the economic sector, and thus about its competitiveness with regard to other sectors. Nevertheless, an inverse relationship exists between this indicator and the level of maturity of the economy, so that in the more advanced economies the indicator's value is lower.

In recent years the share of value added of agriculture in total value added has continually declined, to an annual rate of 2.5%, reaching values comparable to those for central and southern Europe. The lowest impact is in regions of the North-West and the Centre, whereas especially in the South and Islands agriculture's contribution to total value added has remained above 4%, though it has declined to 2.7% above the national average. The regions with the highest share of agricultural value added in total value added (> 5%) are Basilicata, Calabria and Puglia.

Share of agricultural value added in total value added



Share of agricultural value added in total value added



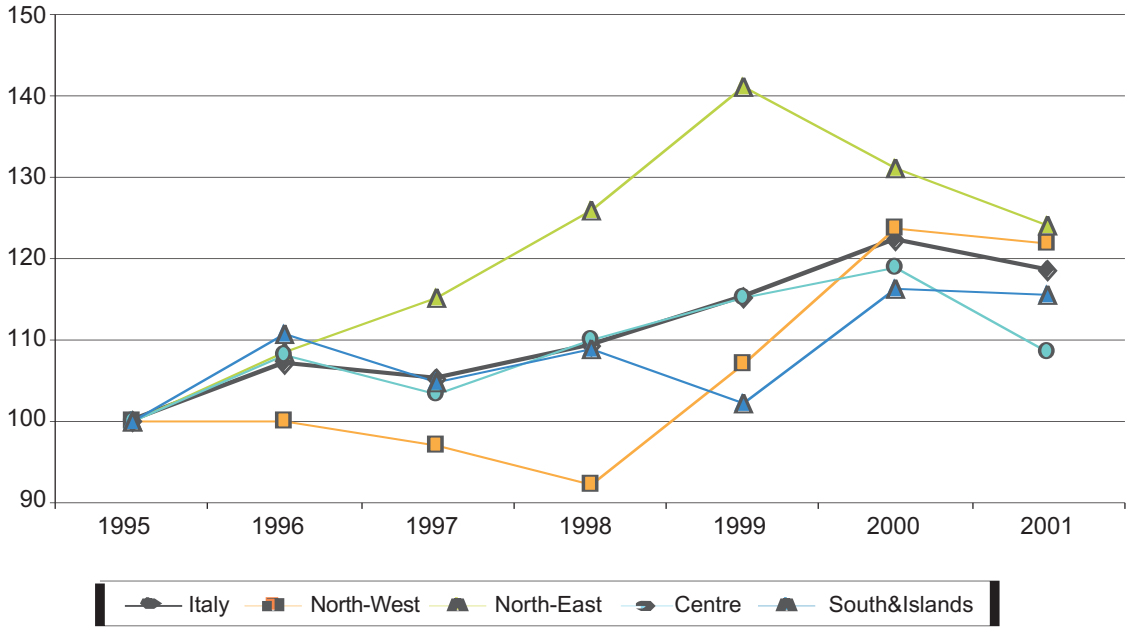
North-West	North-East	Centre	South & Islands	Italy
☹	☹	☹	☹	☹

13. Gross fixed investments in agriculture

Gross fixed investments in agriculture help to increase the competitiveness and efficiency of the sector. The share of investments in agricultural value added is around 30%, with an annual rate of growth of 1.5% from 1995 to 2001.

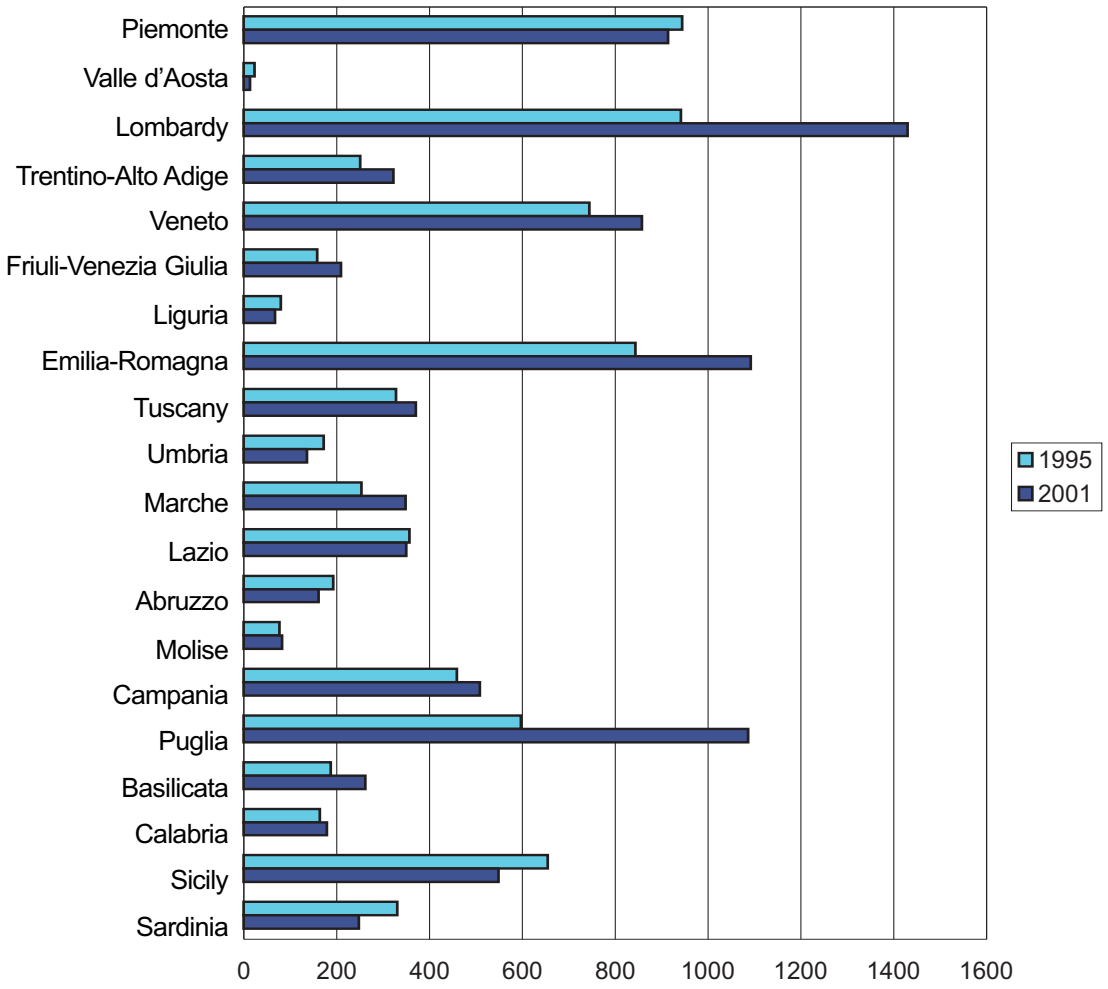
The regions with the greatest investments are Lombardy, Emilia Romagna and Puglia. Between 1995 and 2001, the rate of capital accumulation grew overall, with a 2.4% average annual rate of variation. Geographically speaking, there was strong performance in the North (3.1% in the North-East and 2.9% in the North-West), followed by the South and Islands (2.1%, attributable mainly to Sardinia and Sicily) and the Centre with a more modest dynamic (1.2%, attributable mainly to Umbria, Abruzzo and Lazio).

Expenditures for fixed investments in agriculture (1995=100)



Expenditures for fixed investments in agriculture

(million eurolira 1995)



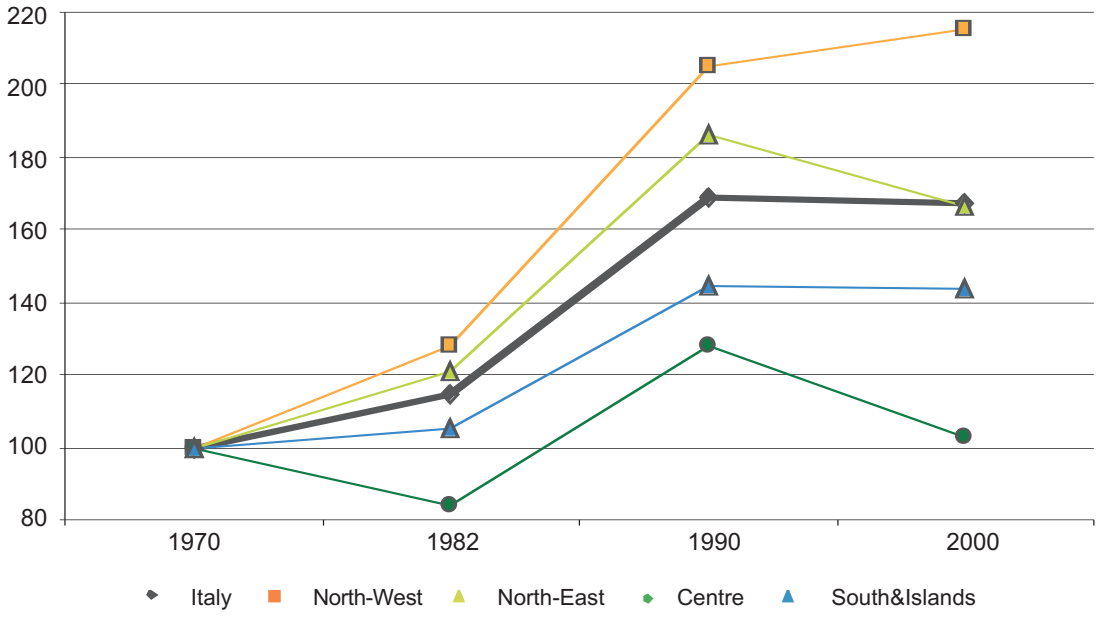
North-West	North-East	Centre	South & Islands	Italy
☺	☺	😐	😐	☺

14. Herd density

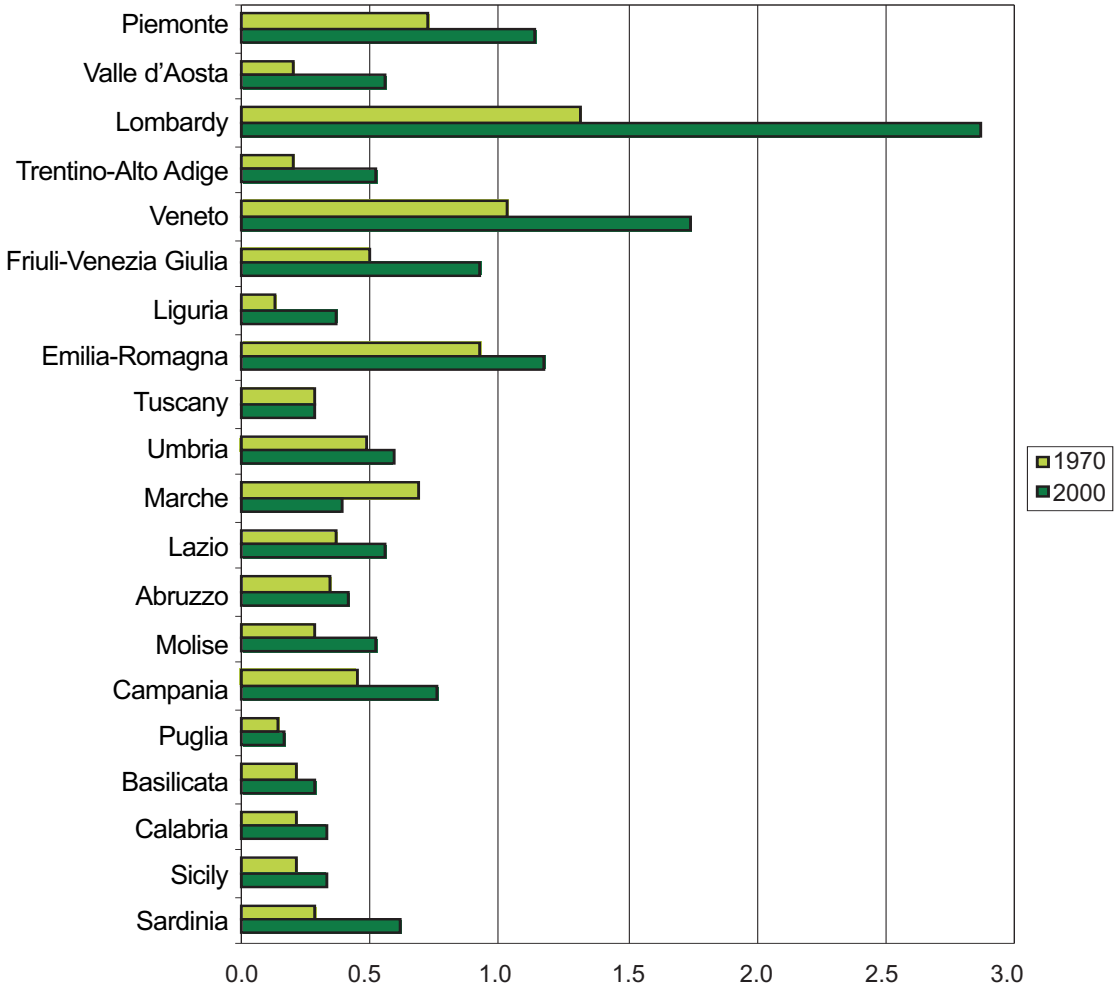
This indicator provides information about potential environmental pressure, especially on the soil, brought about by raising livestock. Such pressure comes mainly from animal-produced effluents, but also from excessive trampling, and may cause soil degradation and water pollution.

From 1970 to 2000, the indicator's value rose from 0.49 to 0.82, signalling growing pressure of raising livestock on the environment. The phenomenon affected all geographical areas, though to varying degrees. The greatest increases occurred in the regions of the North, especially Valle d'Aosta, Trentino Alto Adige and Liguria; the increase in the Centre and the South and Islands was slightly lower than the national average. Exceptions were Sardinia, Molise and Marche. The highest absolute values for the indicator were recorded in Lombardy, Veneto and Emilia Romagna.

Carico di bestiame (1970 = 100)



Herd density (LU/UAA)



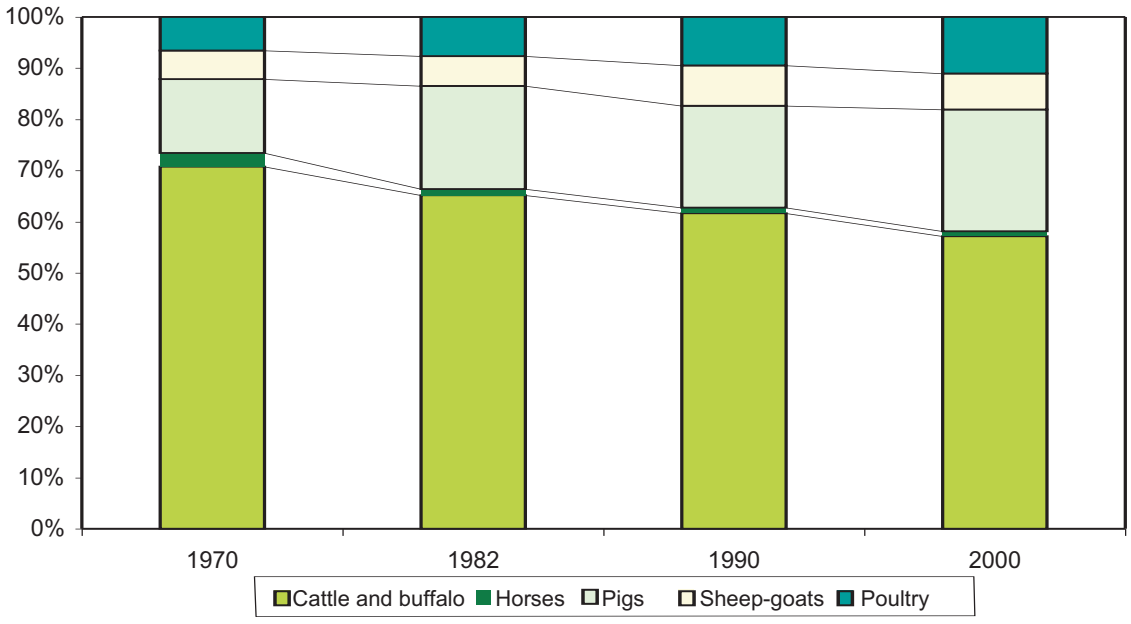
North-West	North-East	Centre	South & Islands	Italy
☹	☹	😐	☹	☹

15. Livestock

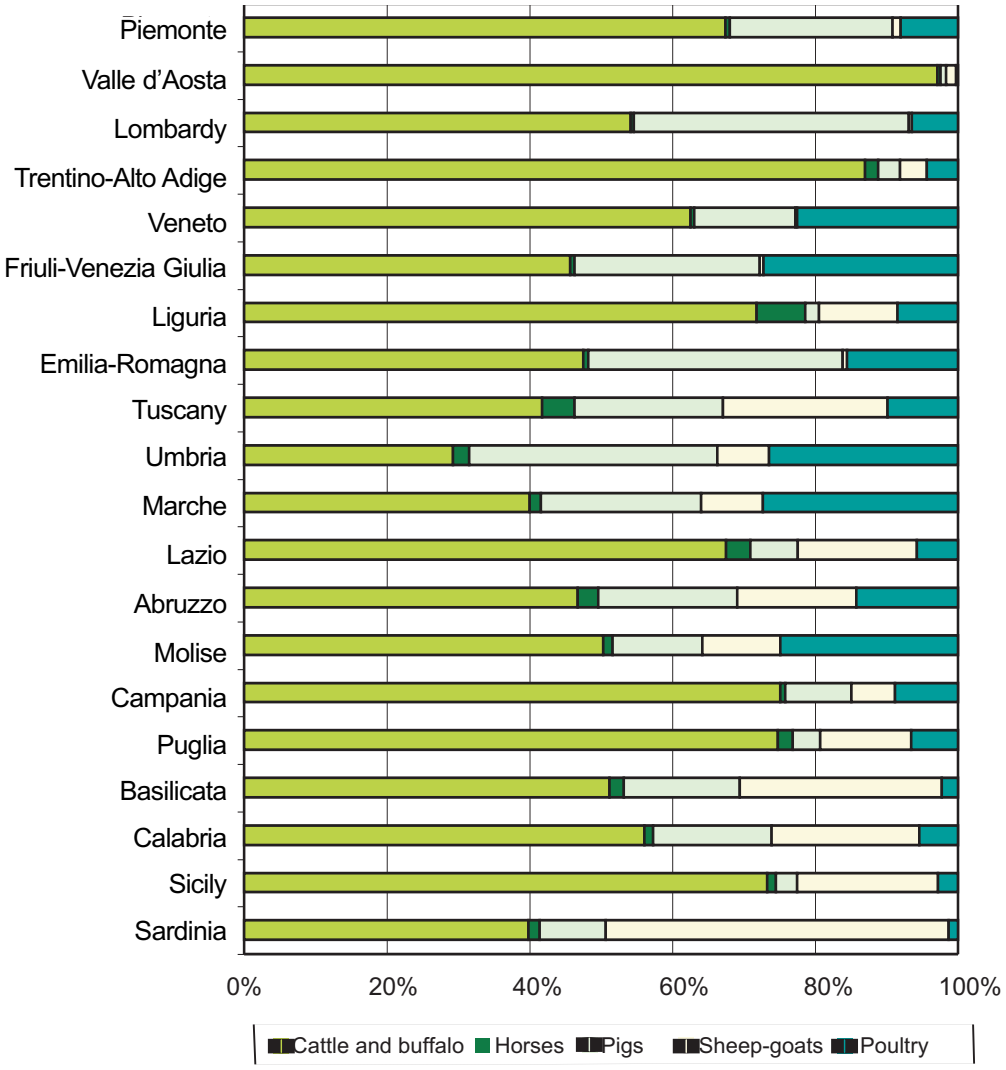
The environmental pressure from raising livestock, besides herd density, varies according to type of livestock. For example, water eutrophication owing to high levels of nitrogen and phosphorus tends to be more frequent in areas with higher concentration of pigs, while soil degradation is more common in areas where sheep and goats are raised. By dividing livestock by type, environmental pressure associated with different species can be shown.

In the period under examination, the breakdown of livestock raising changed. More pigs and poultry were raised, compared with cattle. This trend was stronger in regions of the North-West and North-East: the reduced number of cattle was compensated in the first case by a marked increase in pigs; in the second, by an increase in poultry. In the Centre, increases were recorded in the number sheep, goats and poultry, whereas the breakdown of stock remained more stable in the South and Islands.

Livestock



Livestock 2000



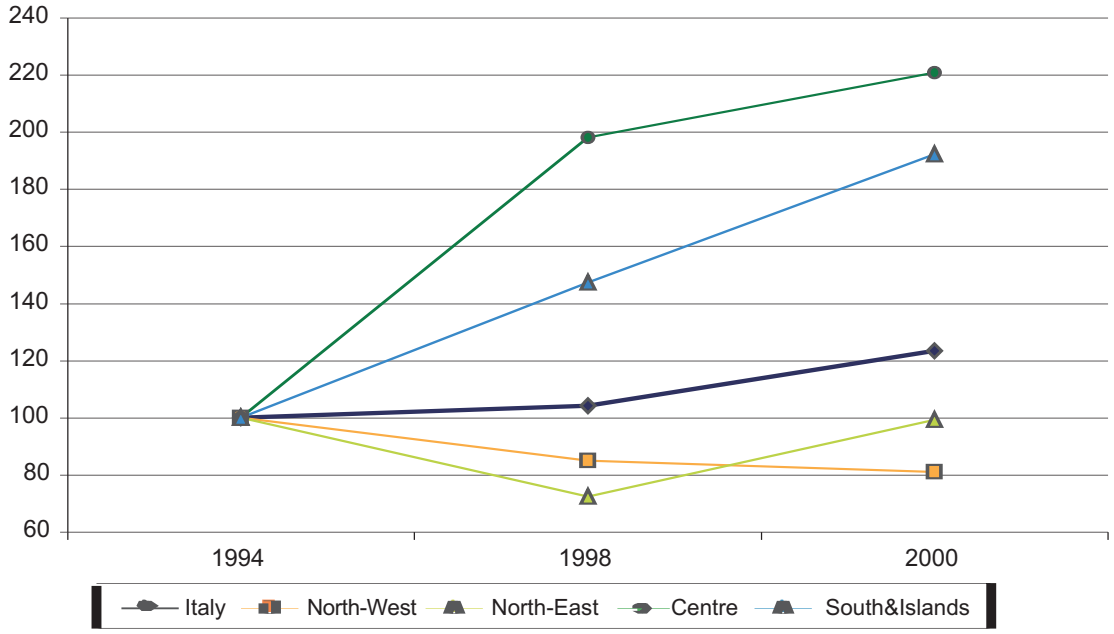
North-West	North-East	Centre	South & Islands	Italy
☹	☹	☹	😐	☹

16. Phosphorus balance

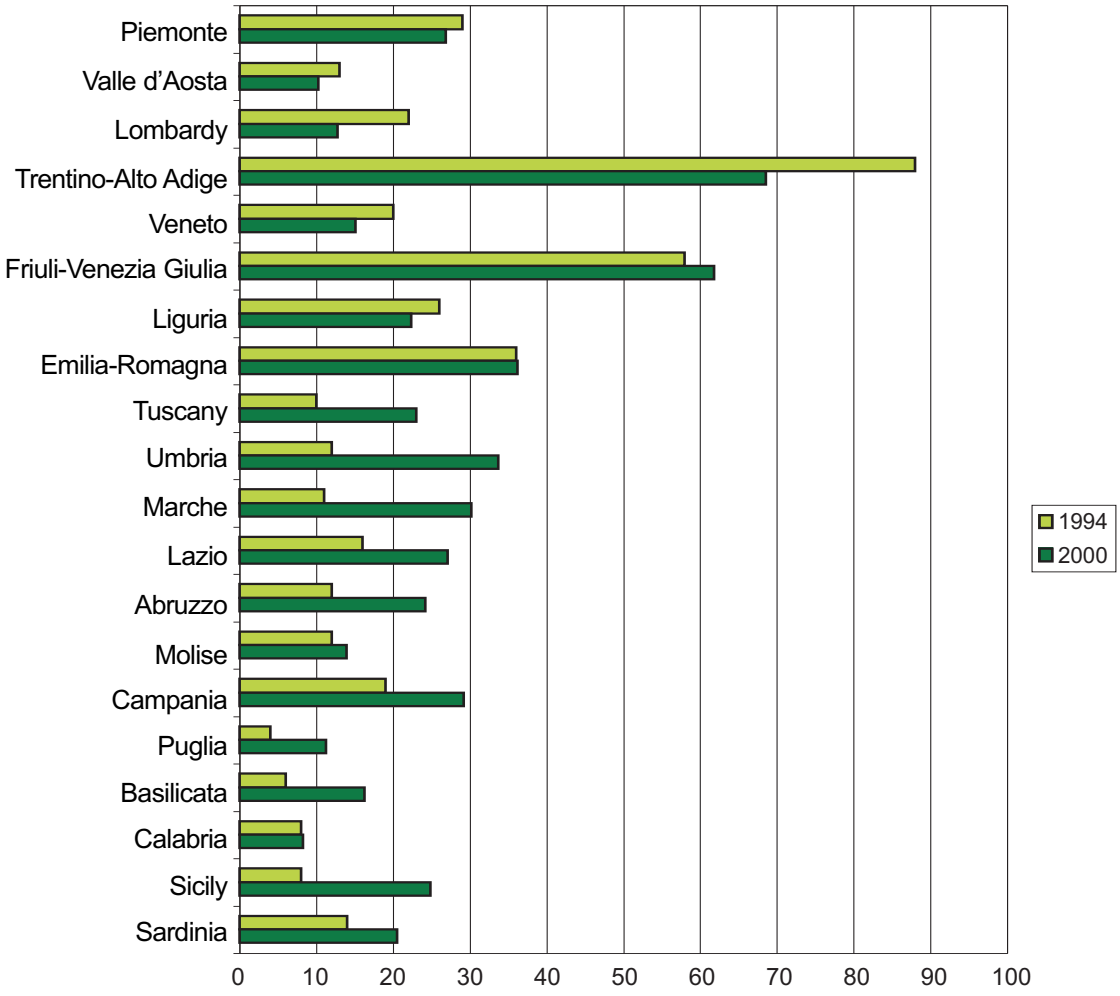
This indicator shows the input/output balance of phosphorus per hectare of land, thus providing data about quantitative surplus. Excess phosphorus released onto the land by organic fertilisers (manure, sewage) and mineral fertilisers (synthetic) is considered one of the agricultural sources of pollution and alteration of the biological and structural balance of the soil. An excess of phosphorus in the soil may in fact reduce species diversity, thus altering competitive equilibrium. Phosphorus is also the main cause of freshwater eutrophication. Reducing levels of phosphorus in soil may take decades, since available phosphorus has to be replaced by reserves of unavailable phosphorus in the soil. It is therefore unreasonable to expect a reversal of this trend in the short term, even with potential reduction in input levels.

Regions with the highest surplus per hectare are those in the North, especially Lombardy and Veneto (more than 60 kg/ha) and Emilia Romagna (36 kg/ha). But those very regions have achieved the greatest reductions in the last six years, whereas despite relatively lower figures the regions of the Centre and South showed the highest increases, especially Umbria, Puglia and Sicily.

Phosphorus balance (1994= 100)



Phosphorus surplus (kg/UAA)



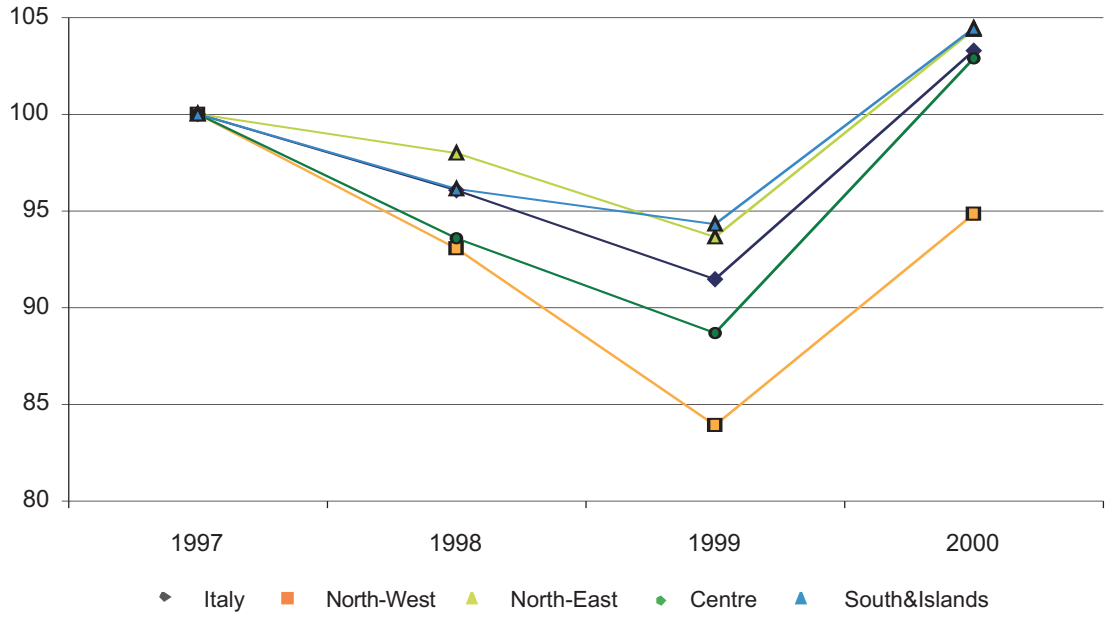
North-West	North-East	Centre	South & Islands	Italy
☹	☹	☹	☹	☹

17. Use of plant protection products

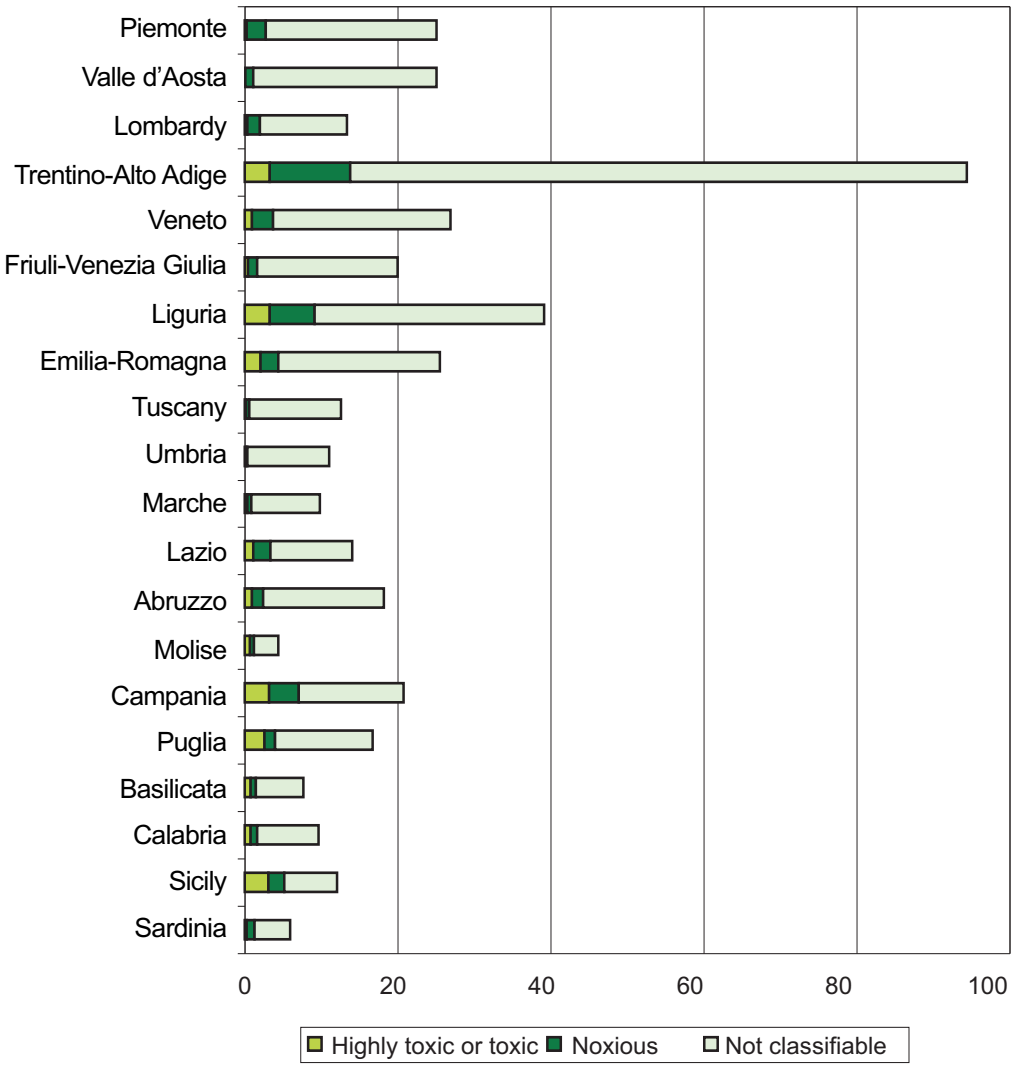
This indicator takes into consideration the amount of plant protection products (classed according to toxicity and content of active ingredients) marketed annually, by hectare of “treatable” area. Plant protection products are used to protect harvests against parasites, pathogens and infestants, and to ensure high quality of production. These substances may remain in the environment for long periods of time in some cases. Their main impact is on the soil (which undergoes changes in chemical, physical and biological properties), on both surface and groundwater, on biological equilibrium (micro-fauna, flora and fauna), and on human health as well.

In fifteen years, the quantity of plant protection products distributed for agricultural use in Italy has decreased by almost 18%, with a marked drop of 10% in the last five years in the use of products that are highly toxic, toxic, or toxic and noxious. There has not, however, been a similar reduction in active ingredients, and their use has remained substantially unchanged. An analysis by unit of “treatable” area confirms on the one hand the marked reduction of the most highly toxic products (especially in the Centre and the North), and on the other it shows a 3% increase in the total amount of plant protection products and a 5% increase in active ingredients. These figures derive mainly from the significant reduction in UAA registered in 2000.

Plant protection products distributed for agricultural use (1997=100)



Plant protection products distributed for agricultural use, classified by toxicity (kg/ha, 2000)



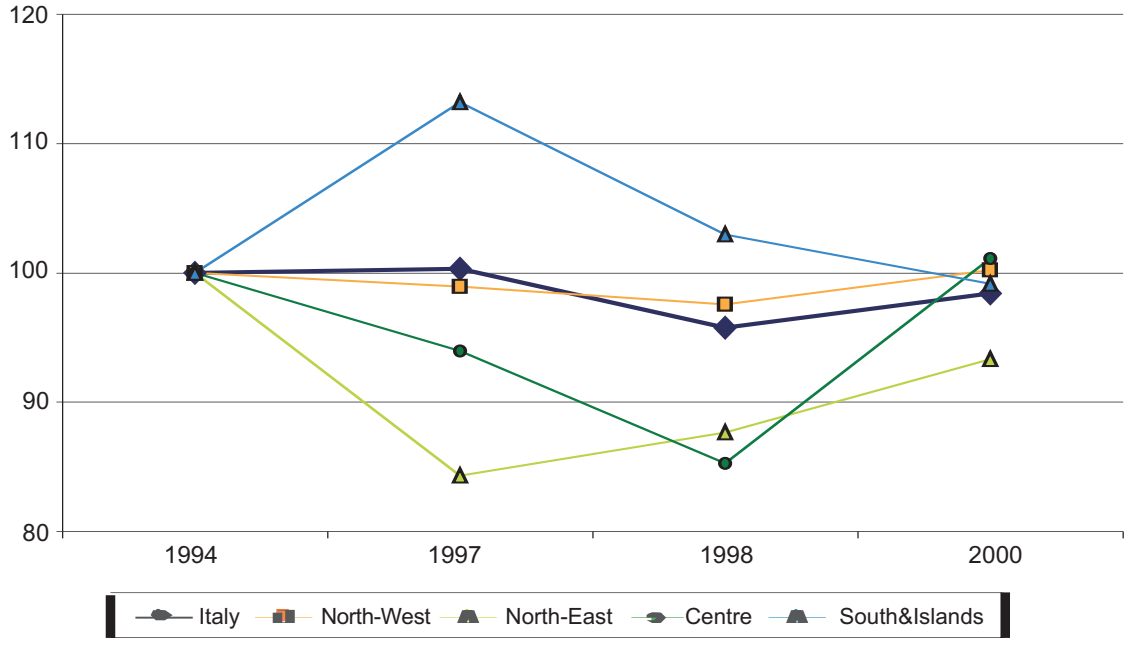
North-West	North-East	Centre	South & Islands	Italy
☹	☹	☹	☹	☹

18. Methane emissions (CH4)

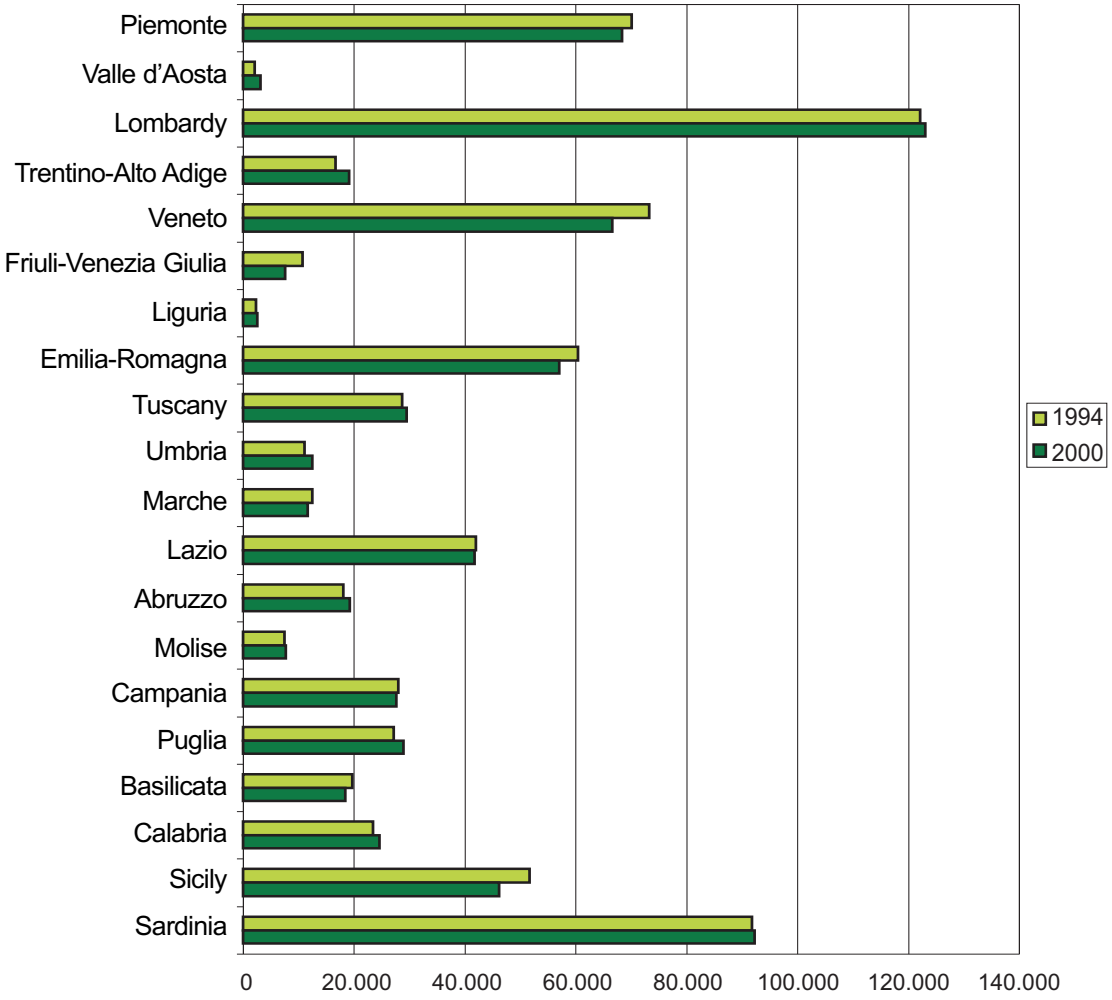
One of the greatest environmental challenges for the international community is the reduction of greenhouse gases (GHGs). Indeed, the agreements reached in the Kyoto Protocol call for a reduction in GHGs by 6.5% compared to 1990 levels, to be achieved between 2008 and 2012. Methane is one of the gases responsible for the greenhouse effect and climate change, resulting in a rise in the temperature of the earth's surface and the lower atmosphere, and causing disturbing repercussions for animal and plant life. Over 30% of methane emissions come from agriculture, especially livestock farming (mainly the raising of ruminants) and rice cultivation.

From 1994 to 2000, methane emissions dropped by 1.6%, from 720,000 to nearly 708,000 tonnes. This reduction occurred almost entirely in the North-East, as against increases in the North-West and the Centre. The greatest quantity of CH4 emissions was produced in the South and Islands (especially Sardinia) and the North-West (especially Lombardy).

Methane emissions (1994=100)



Methane emissions (tonnes)



North-West	North-East	Centre	South & Islands	Italy
☹	☺	☹	☹	☹

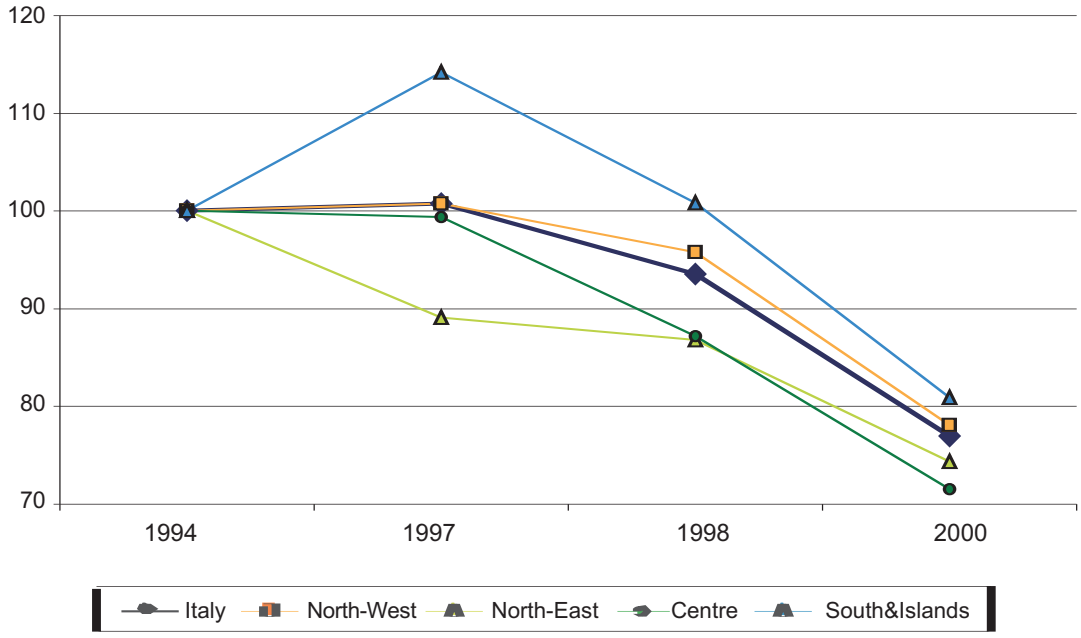
19. Ammonia emissions (NH_3)

Agricultural practices cause nitrogen loss by volatisation, in the form of ammonia, which increases acid rainfall and eutrophication of soil and water systems. Around 90% of ammonia emissions in Europe come from agriculture. The main sources are: a) livestock effluents (based on breakdown, management and use); b) nitrogenous mineral fertilisers (according to fertiliser quality, pedo-climatic characteristics and the vegetative phase of the plant when fertiliser is applied).

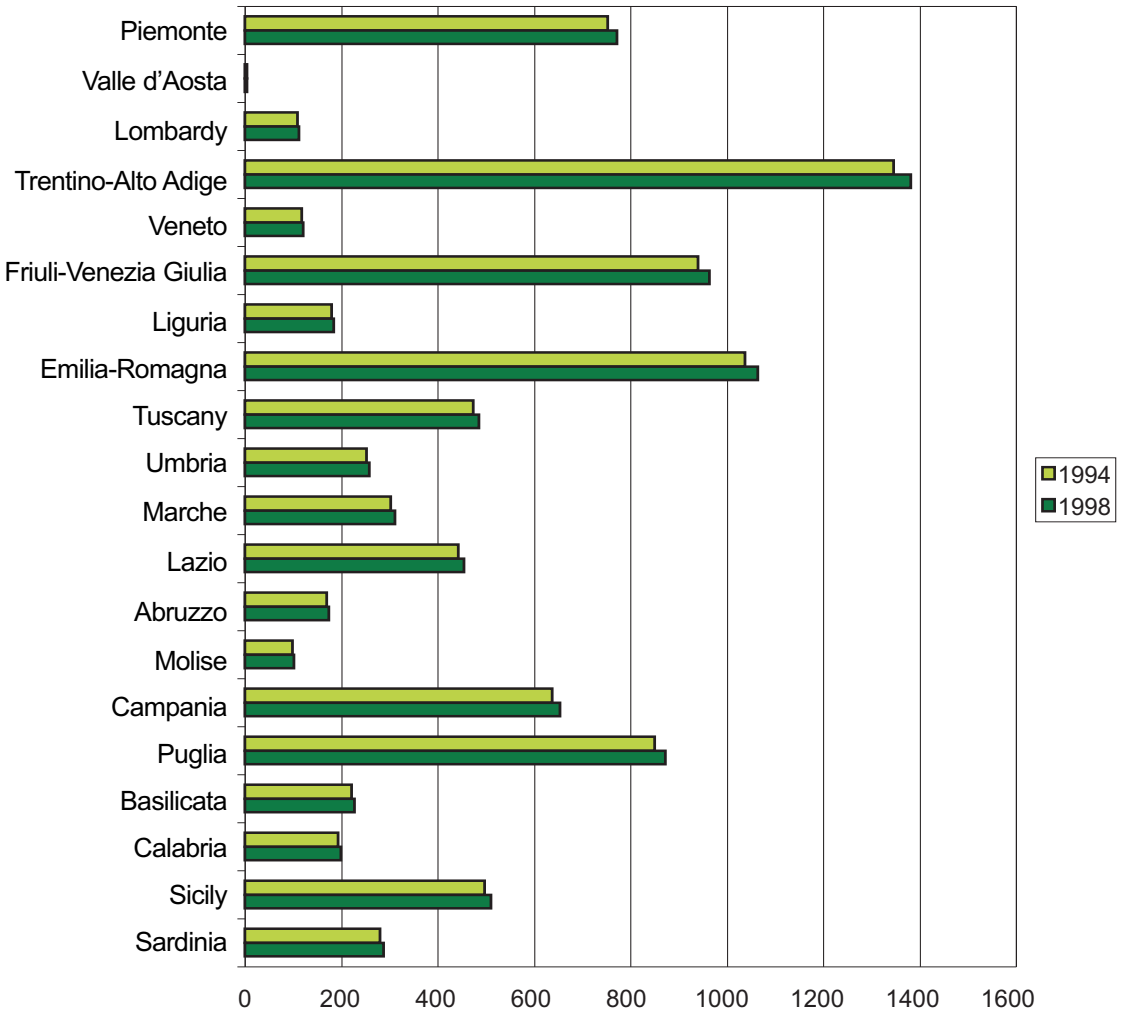
The Geneva Convention on trans-border atmospheric pollution (1999) introduced target reduction levels, differentiated by country, that together would lower NH3 by 17% compared with 1990 levels.

Between 1994 and 2000, there was a gradual decrease in atmospheric ammonia emissions both nationally and regionally. The greatest reductions were achieved in Friuli Venezia Giulia and Campania.

Ammonia emissions (1994=100)



Ammonia emissions (tonnes)



North-West	North-East	Centre	South & Islands	Italy
☺	☺	☺	☺	☺

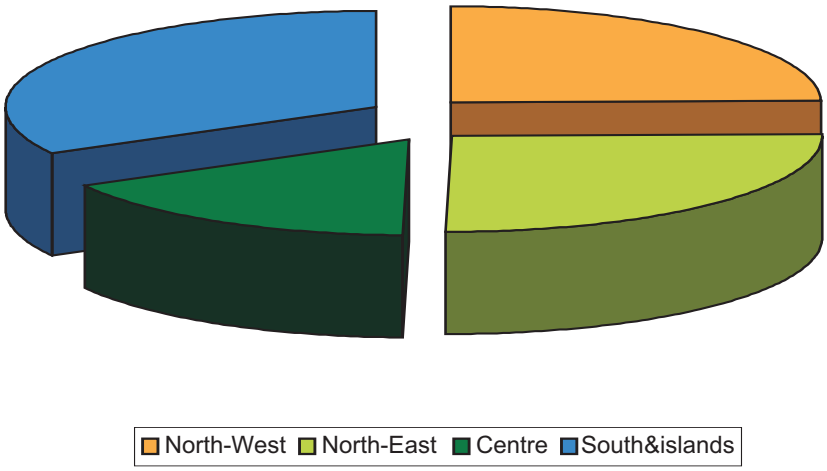
20. Carbon dioxide emissions (CO_2)

This indicator monitors emissions of CO_2 in agriculture. In particular, it assesses emissions from tractor fuel combustion, which are the main source of CO_2. The accumulation of CO_2 in the atmosphere, by altering its degree of radioactivity, may cause important changes in climate balance.

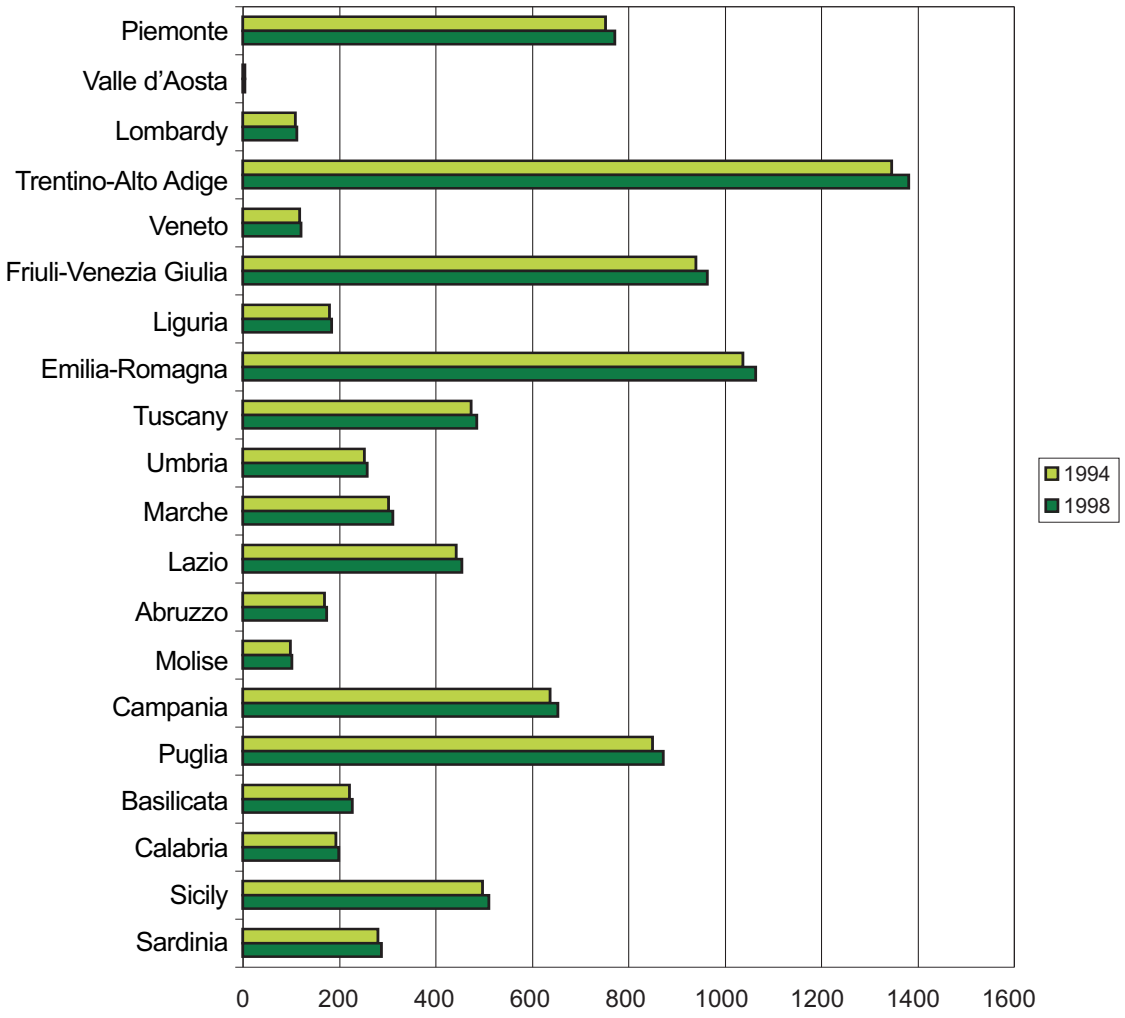
Reducing CO_2 emissions is one of the obligations established by the United Nations Framework Convention on Climate Change and the Kyoto Protocol, which bind Italy to reducing its GHG emissions by 6.5% compared with 1990 levels between 2008 and 2012.

From 1994 to 1998, CO_2 emissions increased on average by 2.6%. The highest emissions were in the North, especially Lombardy, Emilia Romagna (with over 1,000,000 tonnes per year) and Veneto (964,000 tonnes).

Carbon dioxide emissions (1998)



Carbon dioxide emissions ('000 tonnes)



North-West	North-East	Centre	South & Islands	Italy
☹	☹	☹	☹	☹

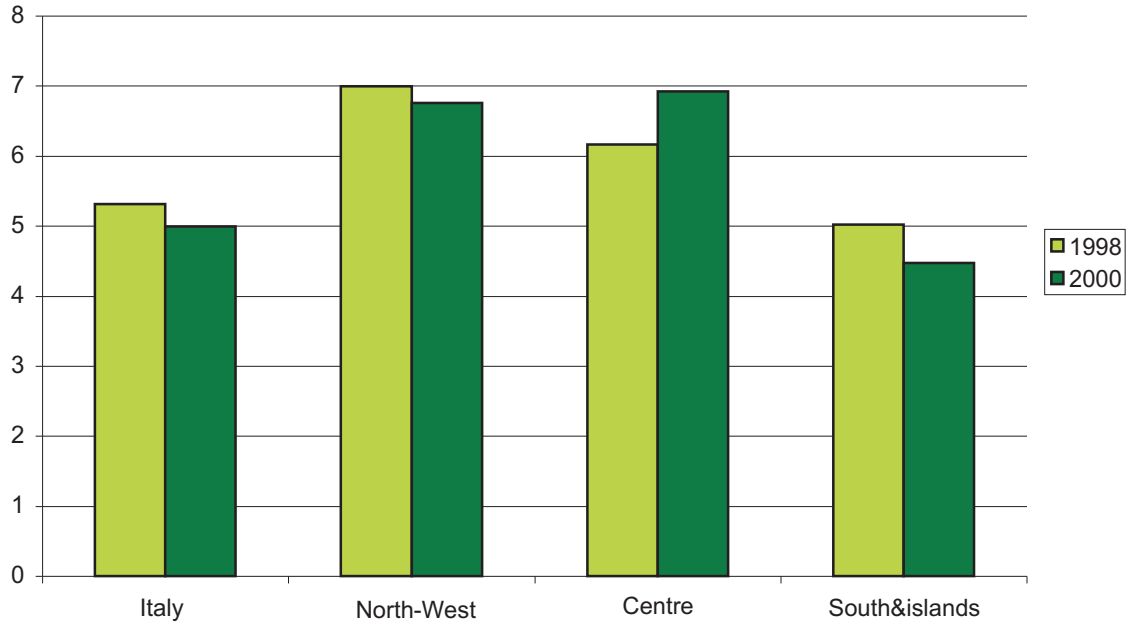
21. Direct use of energy

This indicator provides an estimate of energy consumption based on the use of various direct inputs used in agriculture (fuels and lubricants). The amount of energy consumed depends not only on external factors like atmospheric conditions, but also on technologies used, the introduction of new agricultural practices, and policies that regulate input use.

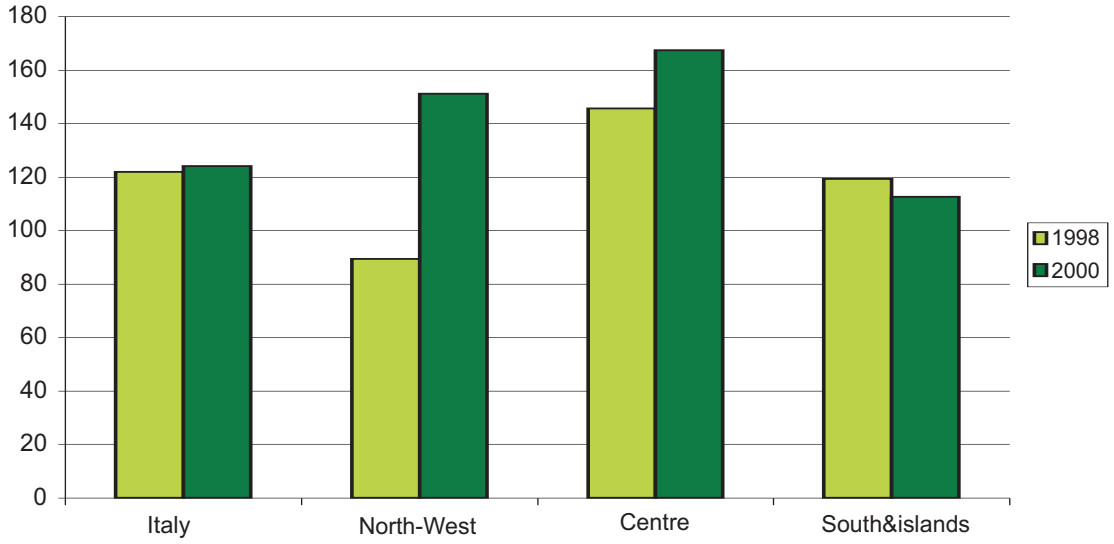
By rationalising direct energy consumption, benefits may be gained both economically (greater efficiency) and environmentally, through better conservation of non-renewable resources, lower emissions of gases into the atmosphere, reduced risk to human health and less water pollution.

In 2000, direct consumption of energy was 363,713 GJ. Between 1998 and 2000, this was reduced by 6%, from 5.3 to 5 GJ per hectare. This trend was influenced by reductions in the South and Islands, and to a lesser extent in the North-West, as against an increase in energy use in the central regions.

Direct consumption of energy (GJ/UAA)



Direct consumption of energy (GJ/farm)



North-West	North-East	Centre	South & Islands	Italy
☺	n.g.	☹	☺	☺

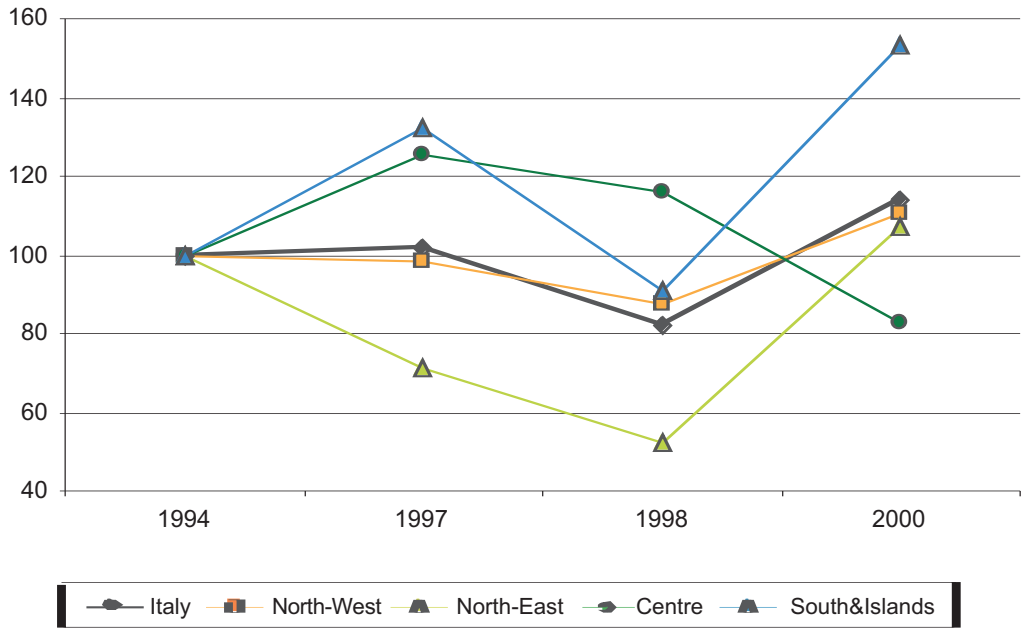
22. Nitrogen balance

Nitrogen is one of the indispensable inputs in both plant and animal production, essential for growth and production. Nitrogen requirements vary according to type of crop and/or livestock, and their productive performance. For plant production, supplies of nitrogen can be both inorganic and organic (manure and refluents); for animals, it comes from plants and sub-products used as feed. In terms of nutritive content, the output of plant production is the input for animal production, and vice versa.

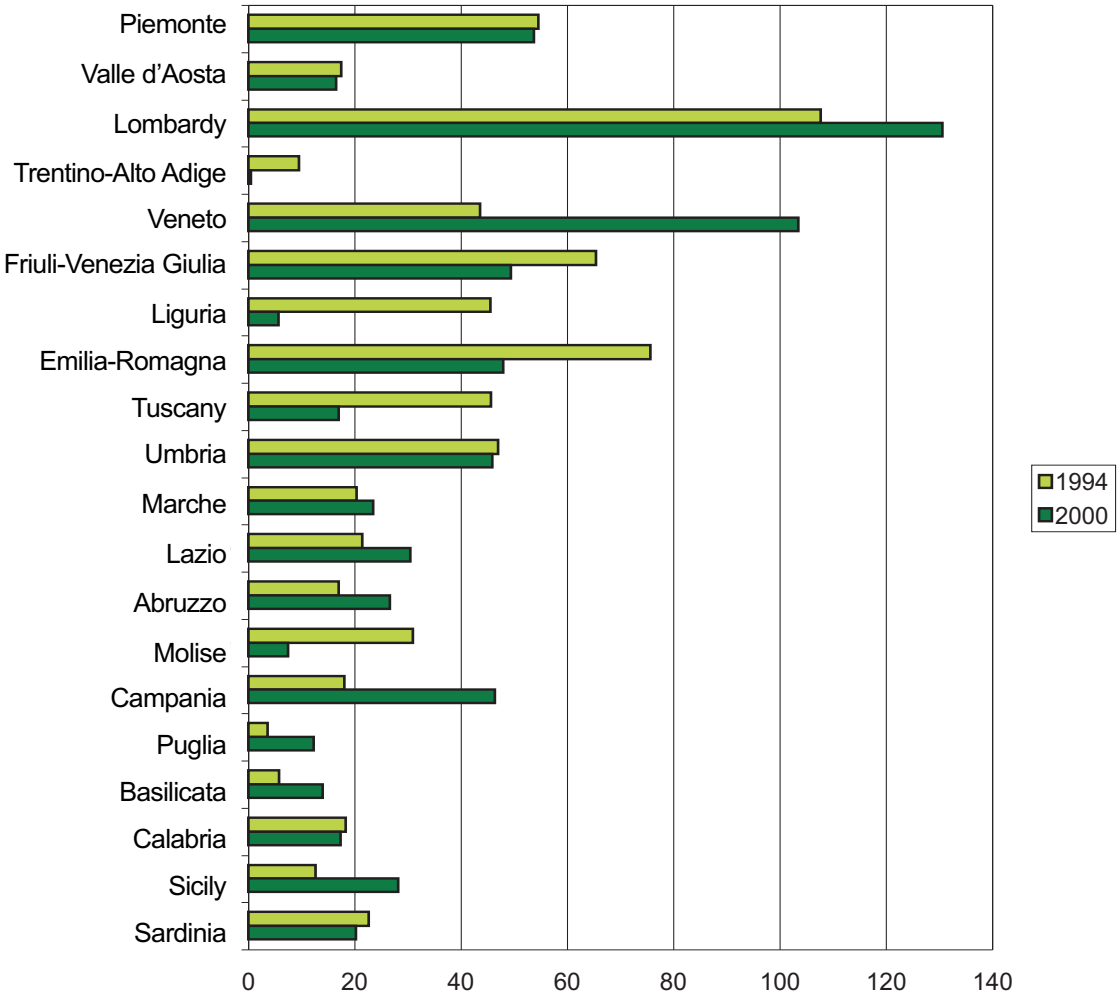
An excess of nitrogen may compromise the quality of surface and groundwater (through percolation and leaching) and air (through ammonia emissions that increase acid rainfall), as well affecting the equilibrium of aquatic ecosystems. Nitrogen loss also implies a loss of economic resources for farmers.

After an initial reduction in the surplus of nitrogen, an average increase was observed in 2000, due partly to less UAA registered in the census. Only the Centre showed a reduction compared to 1994 (-17.22%). Increases in the North did not exceed 10%, whereas the South and Islands registered increases of more than 50%. Regionally the situation varied considerably, with increases of over 230% in Puglia and decreases of up to 90% (Trentino Alto Adige).

Bilancio di azoto (1994=100)



Nitrogen balance (kg/UAA)



North-West	North-East	Centre	South & Islands	Italy
☹	☹	☺	☹	☹

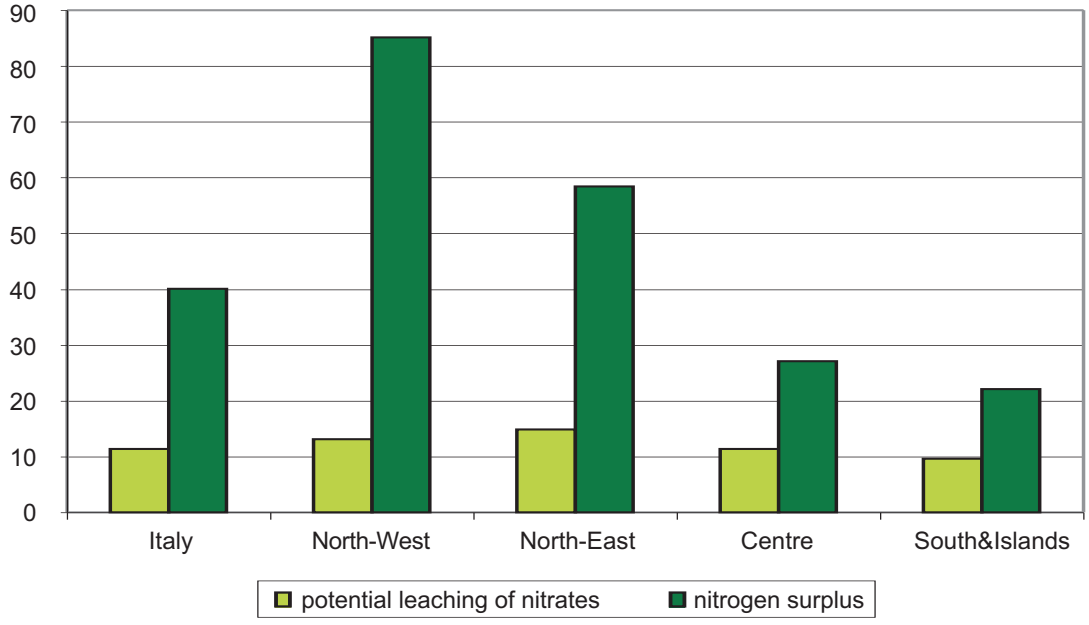
23. Potential leaching of nitrates

This indicator measures the potential environmental pressure of agriculture (crops and livestock) on aquifers.

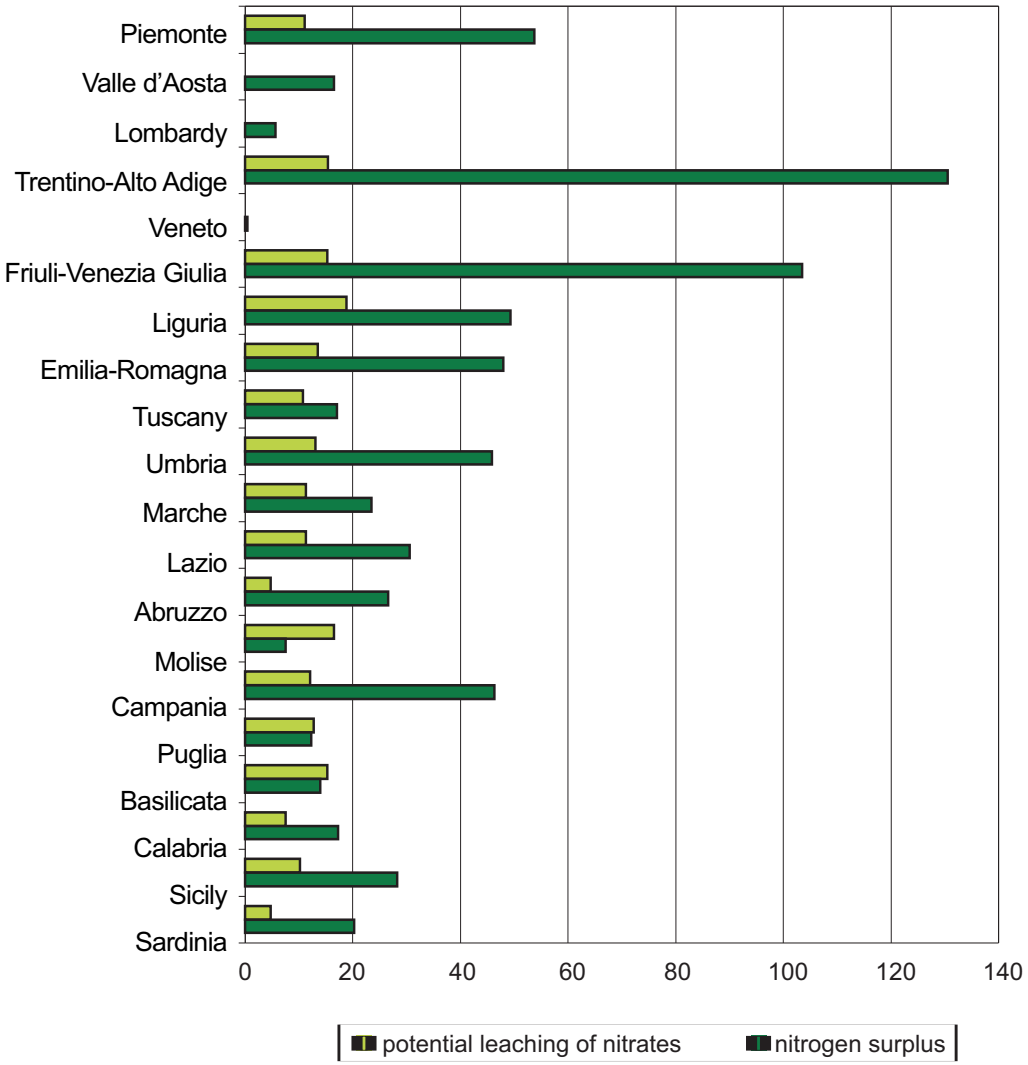
When available nitrogen exceeds the amount needed, the surplus is dispersed into the environment by leaching and volatisation processes. Leaching of nitrogen causes water pollution, and together with large amounts of phosphorus causes water eutrophication. The amount of leached nitrogen, and the resulting water pollution from nitrates, depends not only on the quantity of nitrogen applied, but also on features of the agri-environmental system (e.g. type of soil), the process of de-nitrification, climate conditions and seasons of the year (most losses occur in autumn and winter when plants need less nitrogen and the mineralization of organic matter increases the nitrate content of water in the soil), crop lay-out (nitrogen absorption depends of the type of crop) and cultivation practices (quantity and timing of fertiliser distribution). High surpluses of nitrogen can therefore present low risks of leaching and resulting pollution, and vice versa, based on pedo-climatic conditions and techniques.

In 2000, leached nitrogen (11.37 kg/ha) was approximately one fourth of that in excess (see indicator 22). In analysing the amount of leached nitrogen, the pronounced differences between surplus levels in the geographical areas are considerably minimised, meaning the risks of pollution are fairly uniform throughout the country. Nonetheless, the South and Islands showed the lowest levels (<10 kg/ha).

Potential leaching of nitrates (kg/ha, 2000)



Potential leaching of nitrates (kg/ha, 2000)



North-West	North-East	Centre	South & Islands	Italy
☹	☹	☹	☹	☹

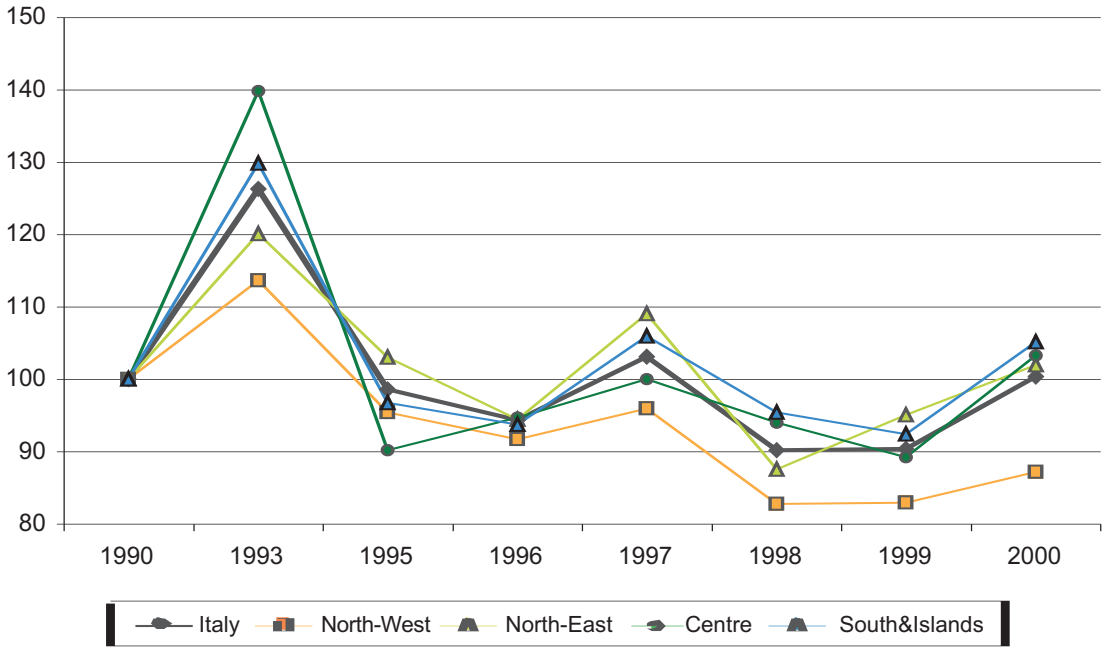
24. Fertiliser use

Mineral fertilisers useful for plant nutrition may cause soil degradation, pollution of water resources and problems of instability in aquatic ecosystems (eutrophication and loss of biodiversity). Use per area unit gives an indication of potential environmental pressure from fertilisation.

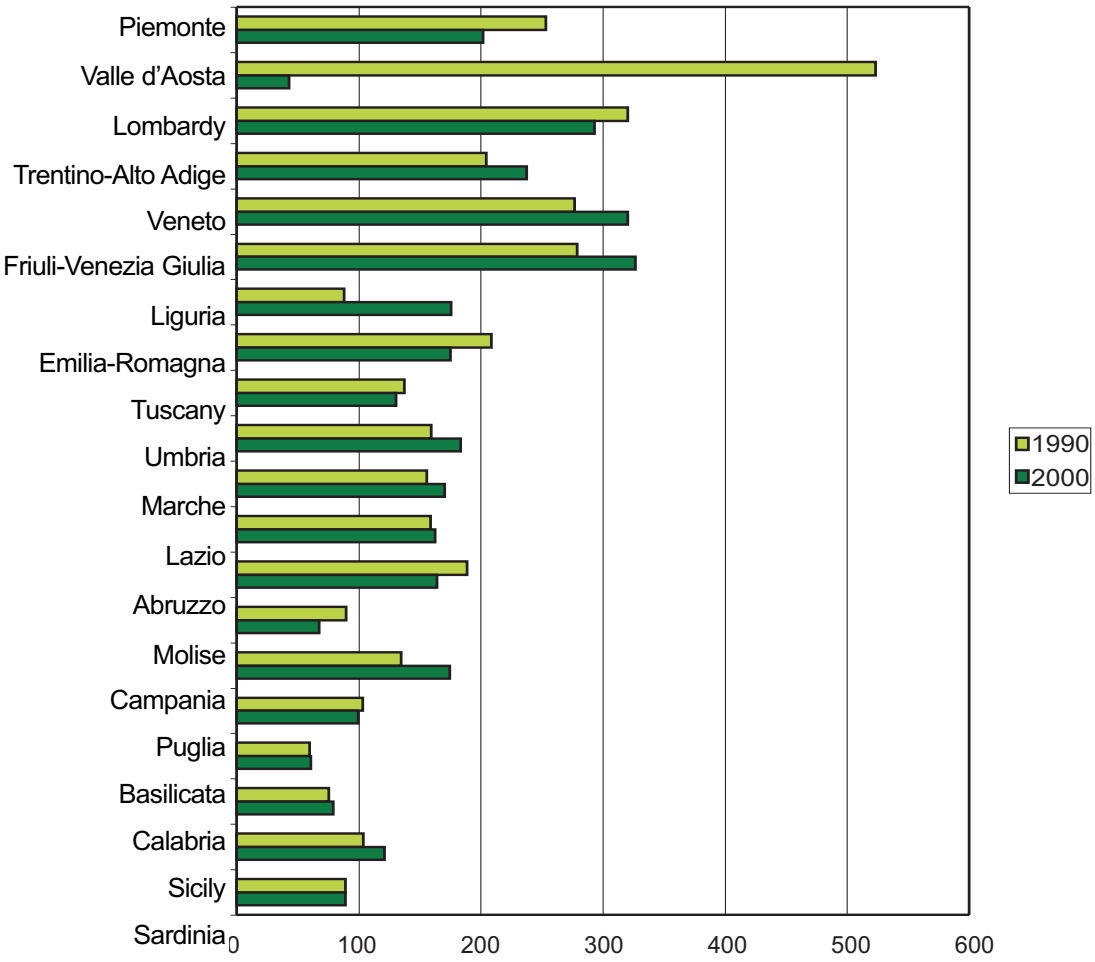
The use of mineral fertilisers is regulated by Legislative Decree 152/99, which acknowledges the European Directive 91/676/EEC, and Law 748/84 and subsequent changes. The Ministry for Agricultural Policies Decree of 19/04/99 “Approval of the Code of Good Agricultural Practice” also defines usage procedure.

After peaking in 1993, distribution of fertilisers per hectare of fertilisable area steadily declined (except for a slight increase in 1997), and then rose again in 2000 when the census revealed a significant decrease in UAA. Overall, since 1990, there has been an increase in the Centre and the South and Islands, and a decrease in the North-West. There has been an annual decline in the regions of Valle d’Aosta, Piemonte, Lombardy, Emilia Romagna, Tuscany, Abruzzo, Molise and Puglia.

Fertiliser use (1990=100)



(kg/unit of fertilisable land)



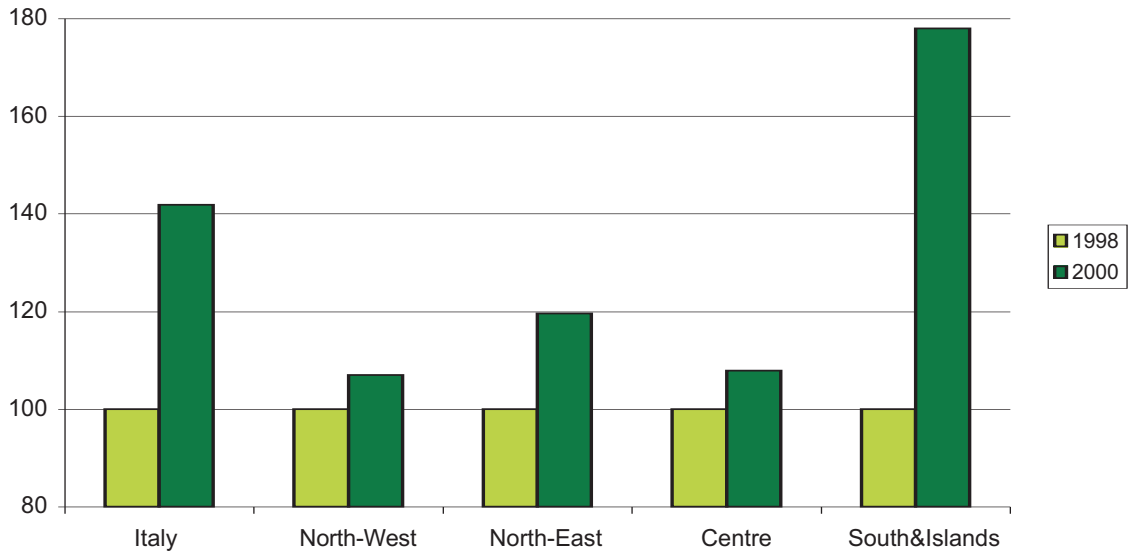
North-West	North-East	Centre	South & Islands	Italy
☺	☺	☹	☹	😐

25. Application of a fertilising plan

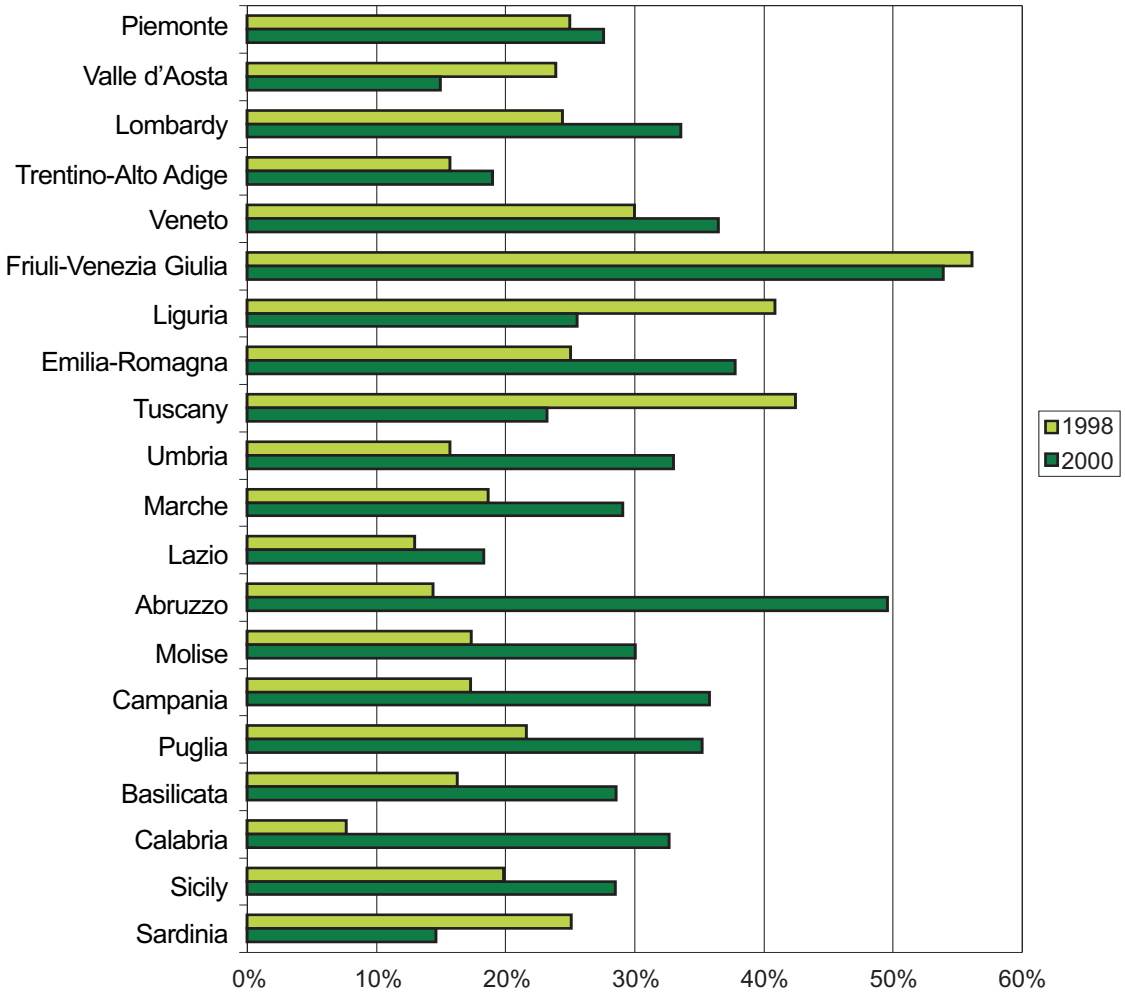
The application of a fertilising plan, by controlling methods, timing and doses of fertiliser, reduces excess nutrients in the soil and inhibits them from being dispersed in water. This practice is a possible answer to environmental pollution due to fertilisers, and contributes to sustainability in agriculture.

The percentage of farms that adopt a fertilising plan is rising rapidly. Since 1998, it has increased by more than 40%, from 20% to 30% of farms. The greatest increases have been in the South and Islands (especially Abruzzo, Campania and Calabria), which have now reached a percentage comparable with the other areas of the country. The percentage of farms in the Centre that use a fertilising plan remains lower than the national average, despite a marked increase in Umbria.

Application of a fertilising plan (1998=100)



Application of a fertilising plan



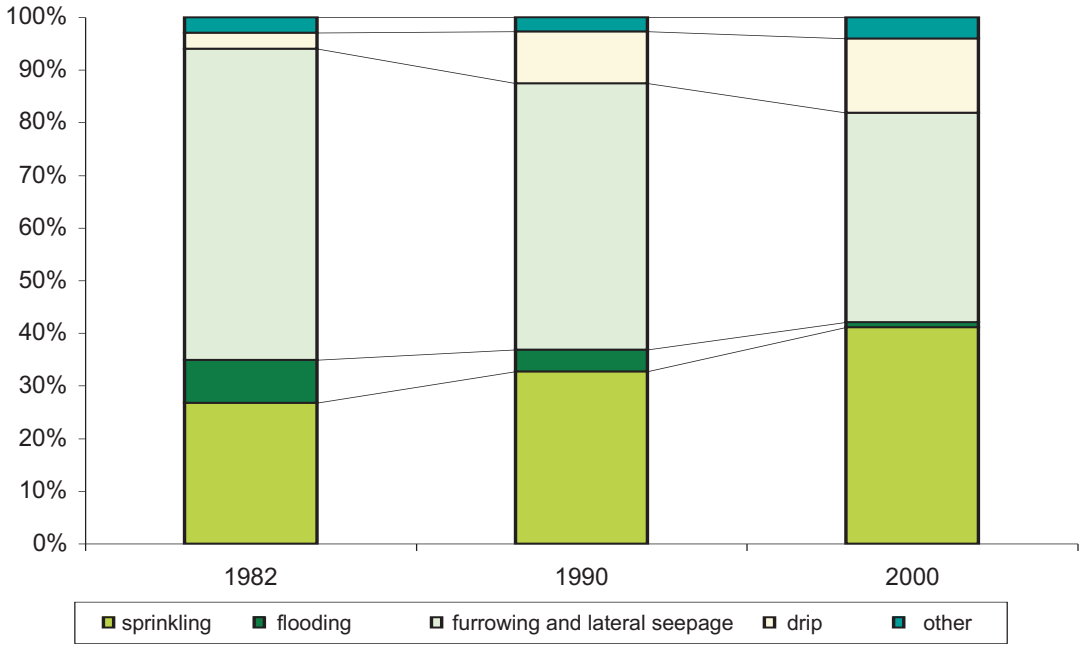
North-West	North-East	Centre	South & Islands	Italy
☺	☺	☺	☺	☺

26. Irrigation systems

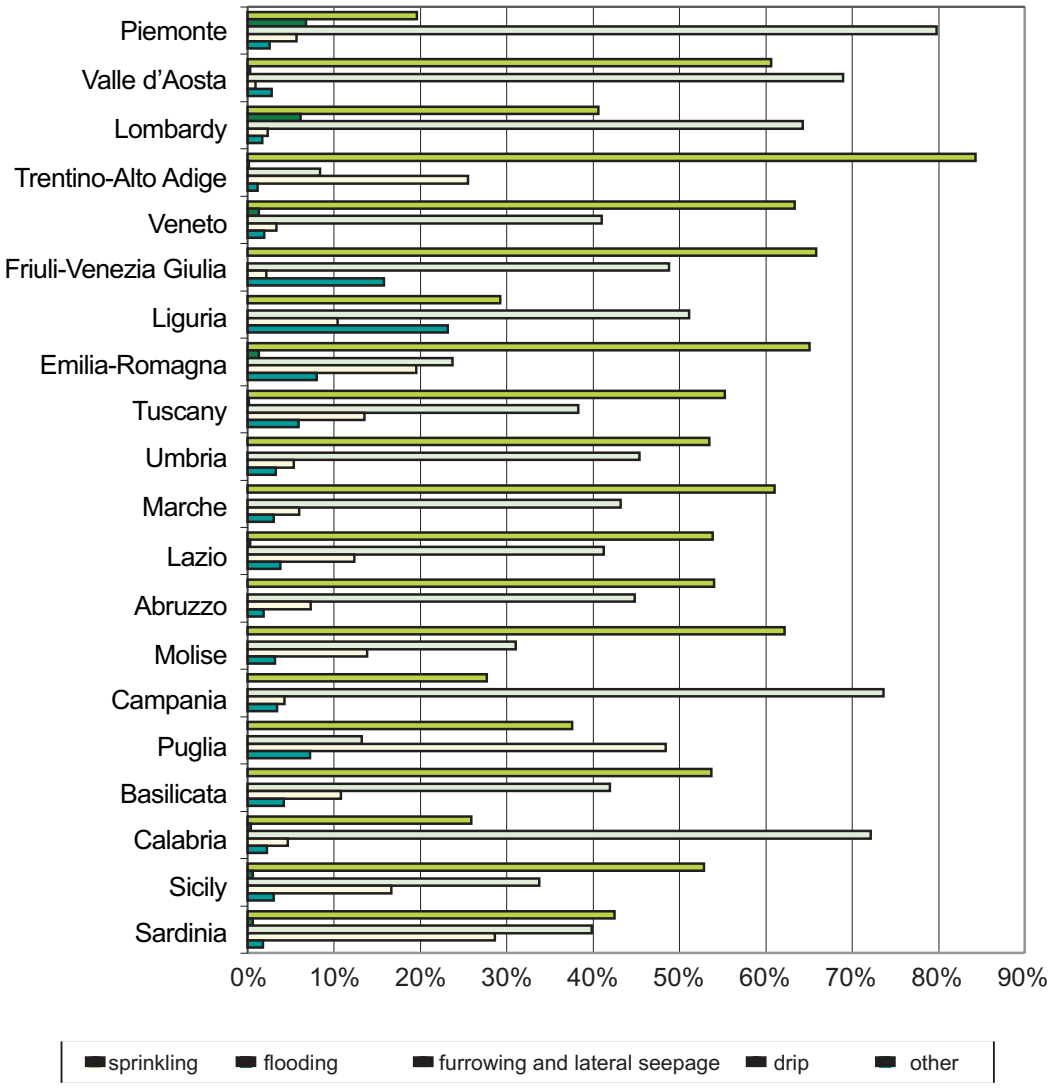
This indicator tracks the use of various irrigation methods. Irrigation systems can be divided into two categories: those that use more water (flooding, furrowing and lateral seepage); and those that use less (sprinklers and drippers). Irrigation systems of the first type exert greater environmental pressure that those of the second. Indeed, besides using more water, they can disperse substances that may pollute the water table, and runoffs that cause water erosion.

The most widely used irrigation systems are sprinklers (around 46% of irrigated farms) and furrowing and lateral seepage (44%), which has declined in use over the last decade and is no longer the preferred system. In the North-West furrowing remains prevalent (67% of farms), whereas in the North-East sprinkling is the method most widely used (68%). From 1980 to 2000, fewer farms used furrowing and flooding, and more used sprinkling and drip irrigation, systems that are more efficient and have less environmental impact.

Irrigation systems in Italy



Irrigation systems (2000)



North-West	North-East	Centre	South & Islands	Italy
☺	☺	☺	☺	☺

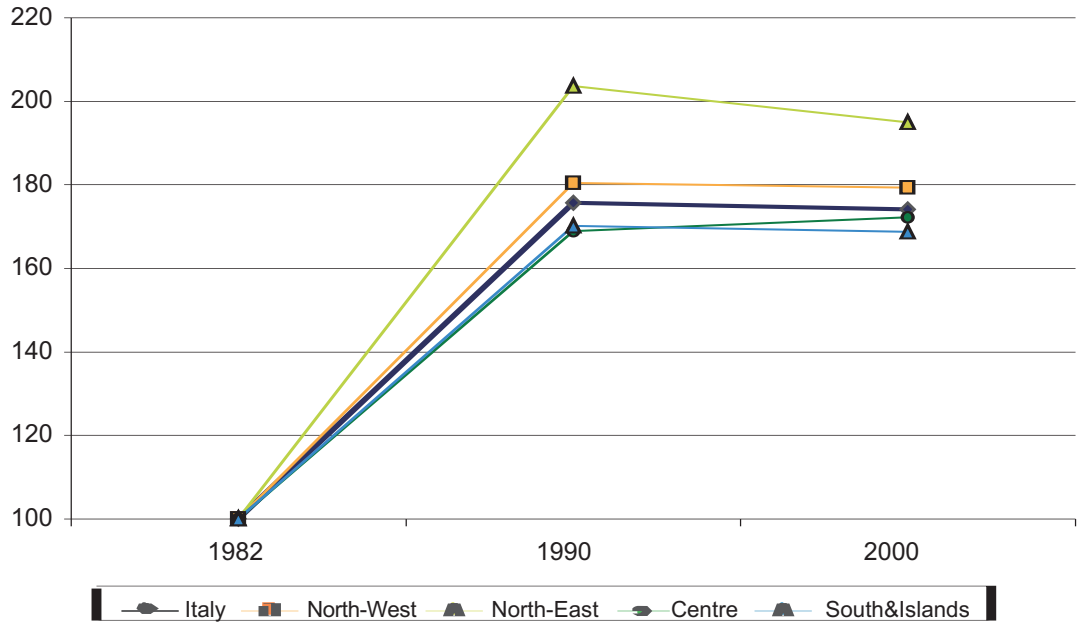
27. Irrigated land

This indicator is offered as a proxy for the quantity of water effectively used in agriculture. The figures are influenced by such factors as pedo-climatic conditions and type of crop. There is more irrigated land in the South and in areas with more fruits and vegetables and crops with high value added.

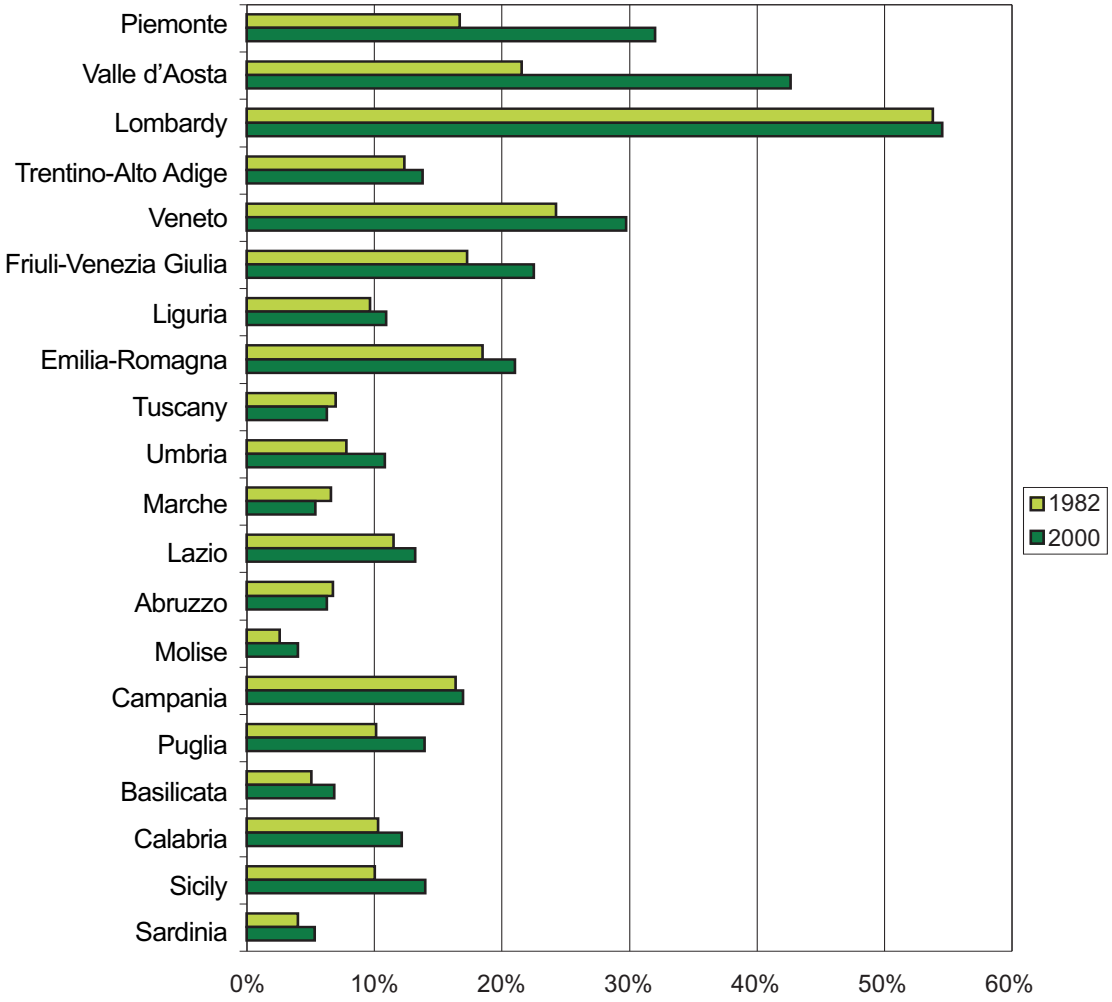
Besides indicating more use of water resources, a higher percentage of irrigated UAA where the soil is unsuitable for planting certain crops may signal problems of soil degradation (water erosion, contamination from the transport of chemical substances) and loss of biodiversity as a result.

In 2000, Italy had 2,468,000 hectares of irrigated land, or 18% of UAA. Compared to 1982, it increased slightly in absolute terms and quite considerably in terms of UAA, from 10% to 18%. This trend may be largely attributed to the significant reduction in UAA registered in the 2000 census. The North showed the highest irrigated UAA and the greatest annual rate of increase. Irrigated UAA in the Centre and South did not exceed 11%, though the annual rate of increase was around 3%. As for the regions, the greatest increases occurred in Piemonte and Valle d'Aosta.

Share of irrigated UAA (1982=100)



Share of irrigated UAA



North-West	North-East	Centre	South & Islands	Italy
☹	☹	☹	☹	☹

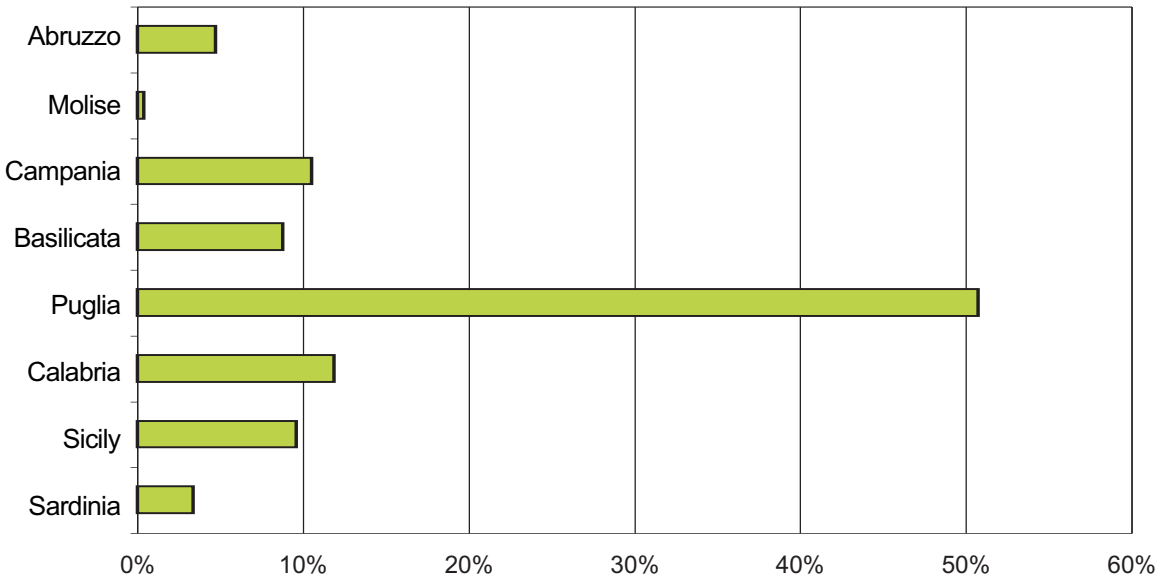
28. Type of catchment

Of the water abstracted from the 741 sources used by regional water authorities in the South and Islands, 53% comes from catchment of groundwater (mostly from wells in Puglia). Catchment from surface wells makes up 5% (mainly in Campania and Basilicata); water abstracted from springs - whose flow are often scant - are used mainly for irrigation purposes, and accounted for 8%. Water abstracted from natural lakes and/or reservoirs and artificial lakes accounted for nearly 10% and also includes large storage beneath dams. Finally, there are 119 (16%) river weir intakes and 30 (4%) canal intakes.

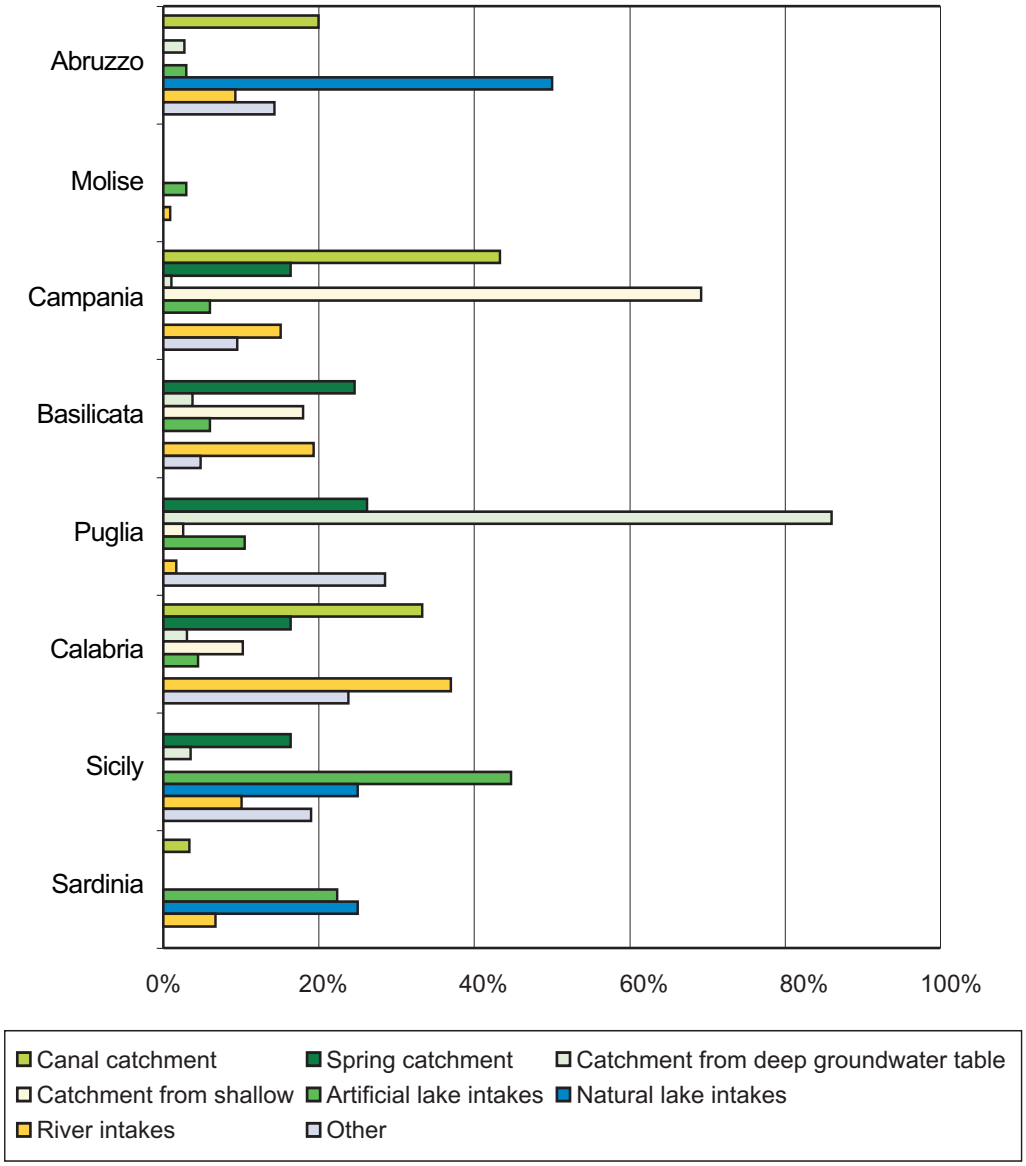
The abstracting of groundwater (almost 60% of registered sources) causes the greatest environmental pressure, since in cases where bodies of water are exploited faster than they can be replenished the water table may drop, and in areas close to the sea, saltwater can seep in and damage water quality. The situation is actually even worse, as the indicator does not include private catching structures that do not fall under planning and control measures, and which are often linked to illegal pumping.

The case in Puglia is especially significant: 92% of supply comes from groundwater, a fact aggravated by a poorly developed surface-water network and widespread use of irrigation farming.

Percentage breakdown of types of catchment by region



Type of water catchment



South & Islands

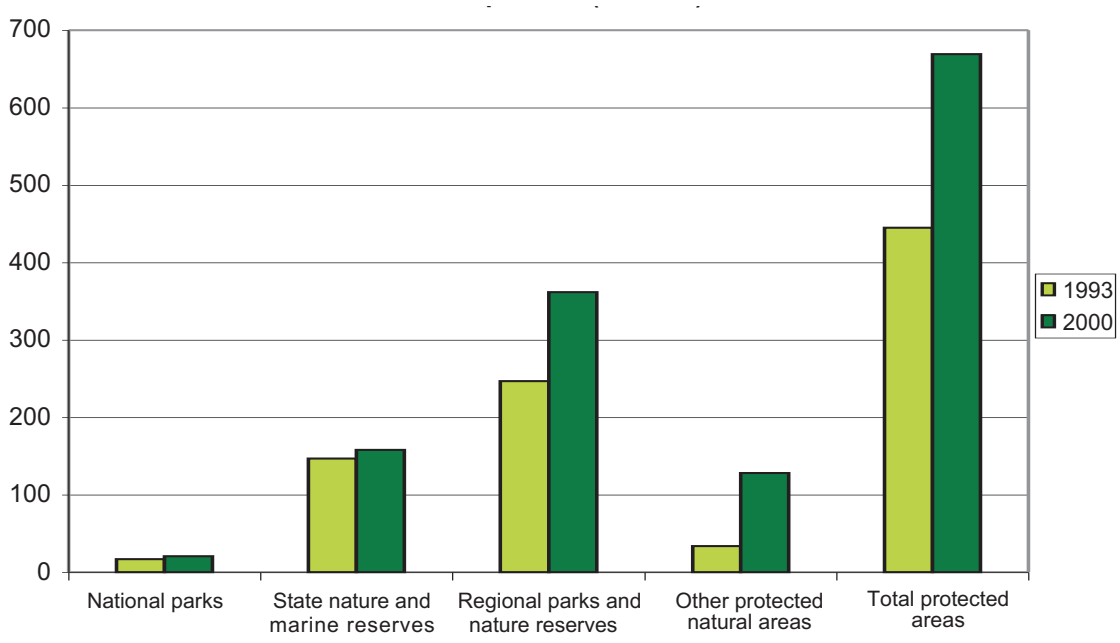
29. Protected areas

Protected areas have significant natural and environmental value protected by specific safeguards, including bans on activities that may damage the landscape, natural environments and protected flora and fauna.

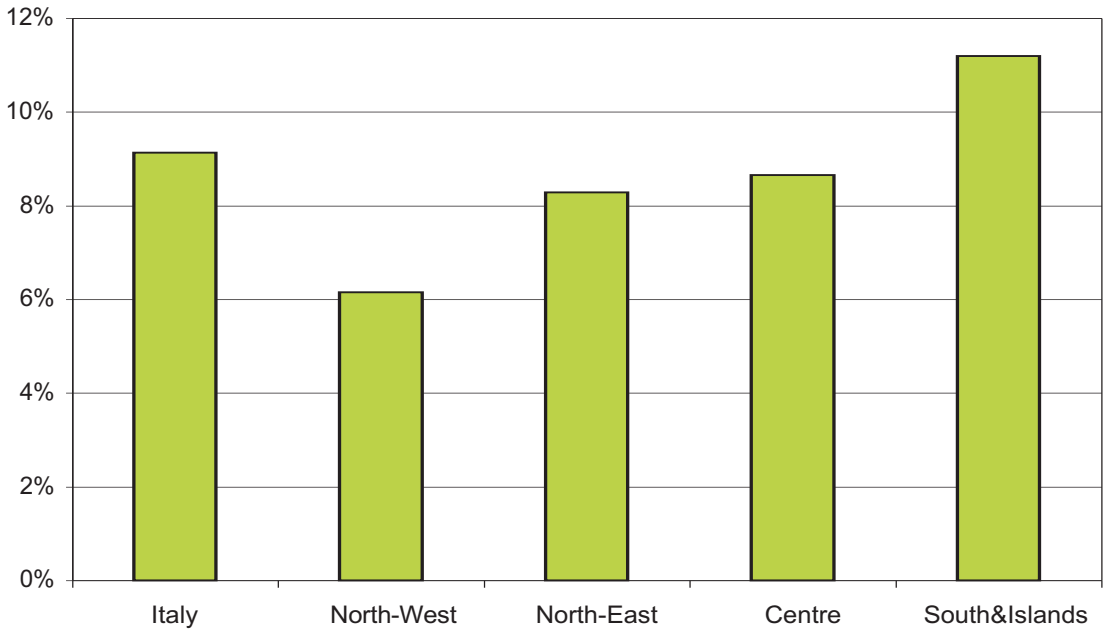
The increase in numbers or dimensions of these areas therefore indicates improvements to the landscape and greater protection of biodiversity.

In 2000, there were 669 protected areas in Italy, covering a total of 2,752,952 hectares, which included 21 national parks, 143 state nature reserves, 15 state marine reserves, 110 regional nature parks, 252 regional nature reserves and 128 other protected natural areas. In the last fifteen years, protected areas increased by 8.5% (from 445 to 669); there was a particular increase in parks (from 75 to 110) and regional nature reserves (from 172 to 252). The greatest percentage of national nature areas is concentrated in the South and Islands (around 50%), corresponding to 11.2% of total area. The three regions with the greatest number of protected areas are, in order: Campania, Abruzzo and Trentino Alto Adige; Molise and Liguria have the fewest.

Protected areas (number)



Protected areas (share of national territory), 2000



North-West	North-East	Centre	South & Islands	Italy
☺	☺	☺	☺	☺

30. Condition of plant species

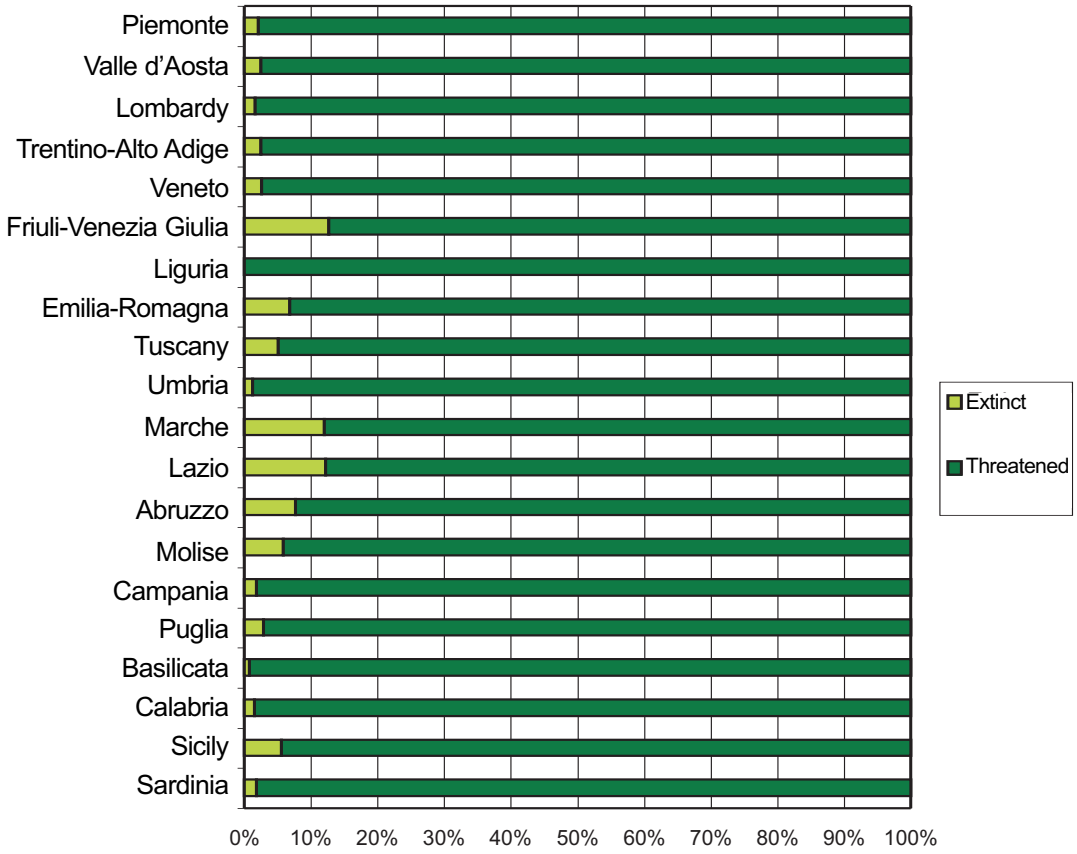
This indicator monitors the presence and condition of some endangered plant species (included in the “Red List”), relevant to the objective of preserving species diversity. In this case, measurement of biodiversity is associated with the concept of richness of species, or their presence/absence.

Though a reduction in number of species generally indicates diminished biodiversity, caution must be used in interpreting this indicator, since it should be considered in connection with expected richness of species in habitats and the ecological areas under consideration, that is to say, with characteristic species in various habitats.

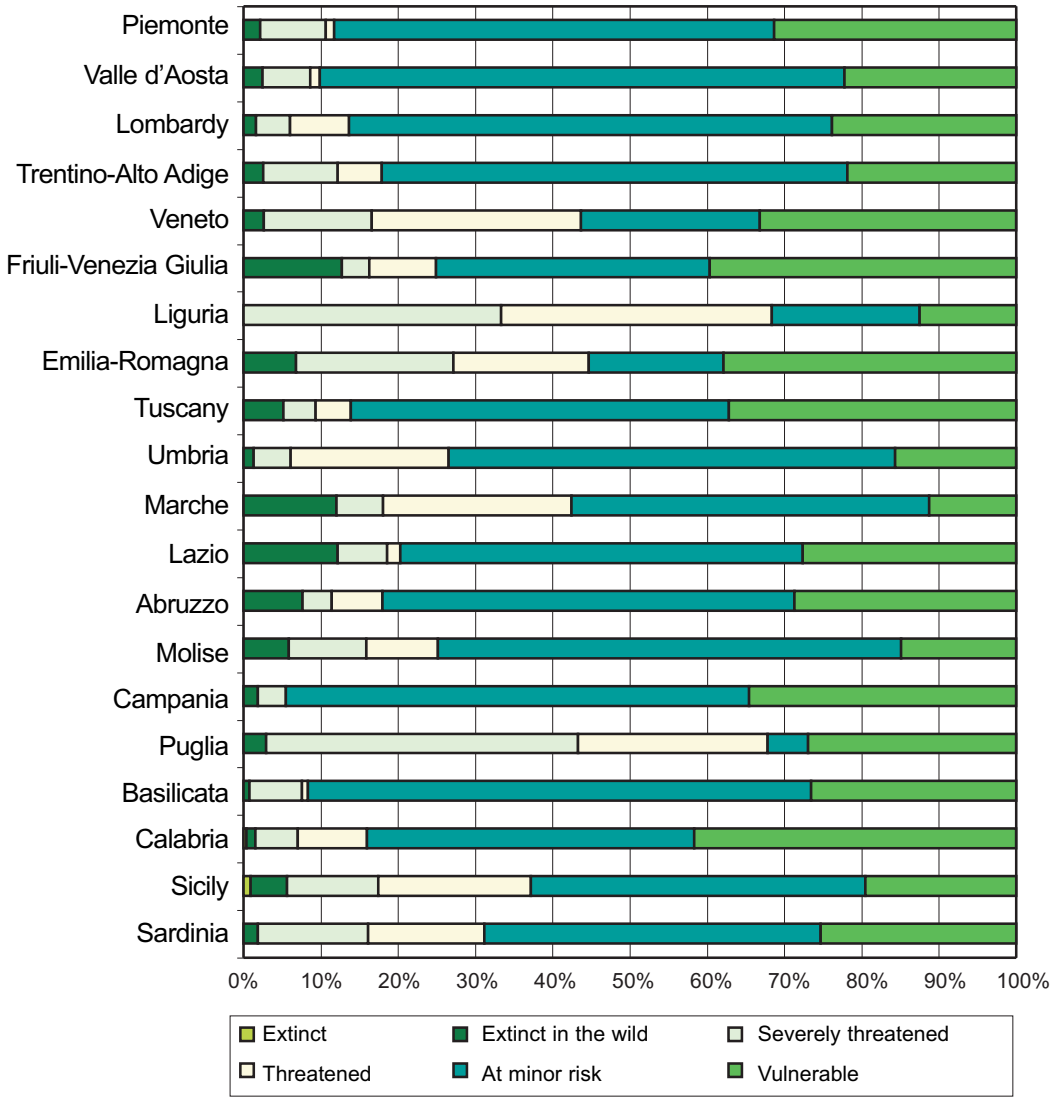
The regions with the most endangered plant species are Sicily (589), Lazio (563) and Abruzzo (518). In Sicily 6 species are already extinct, and 29 are extinct in the wild. The highest percentage of threatened and severely threatened species is in Sardinia, Marche, Puglia and Liguria.

Analysis has not been made by area and nationally, since the aggregation of regional data does not correspond to the number of endangered species by area or nationally, as each species may be endangered in more than one region.

Extinct and endangered species (1995)



Extinct and endangered species (1995)

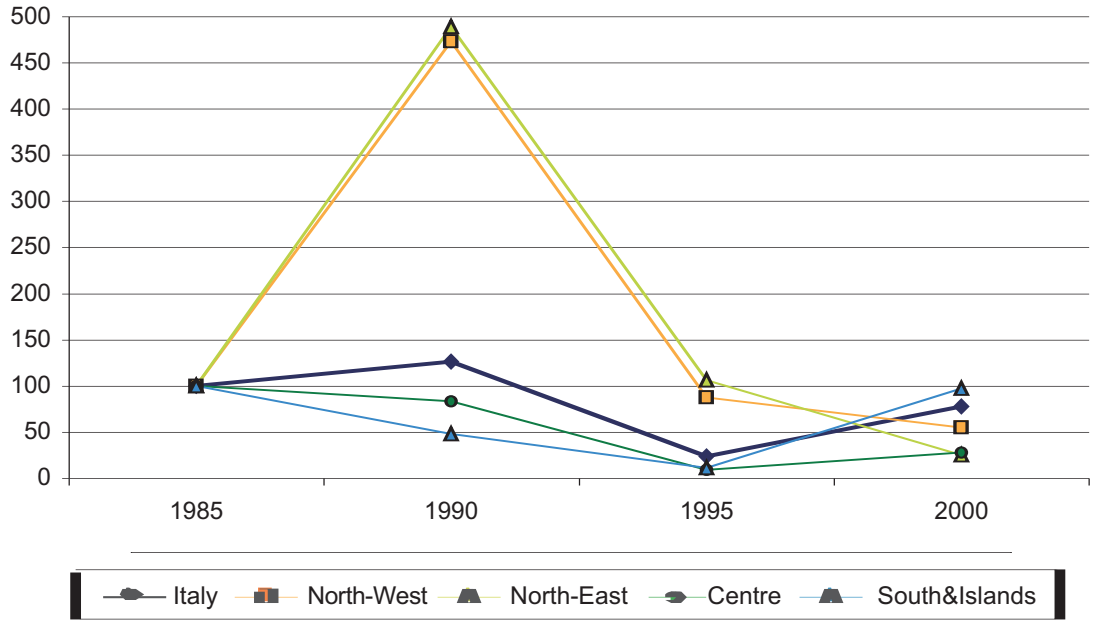


31. Wooded land affected by fire

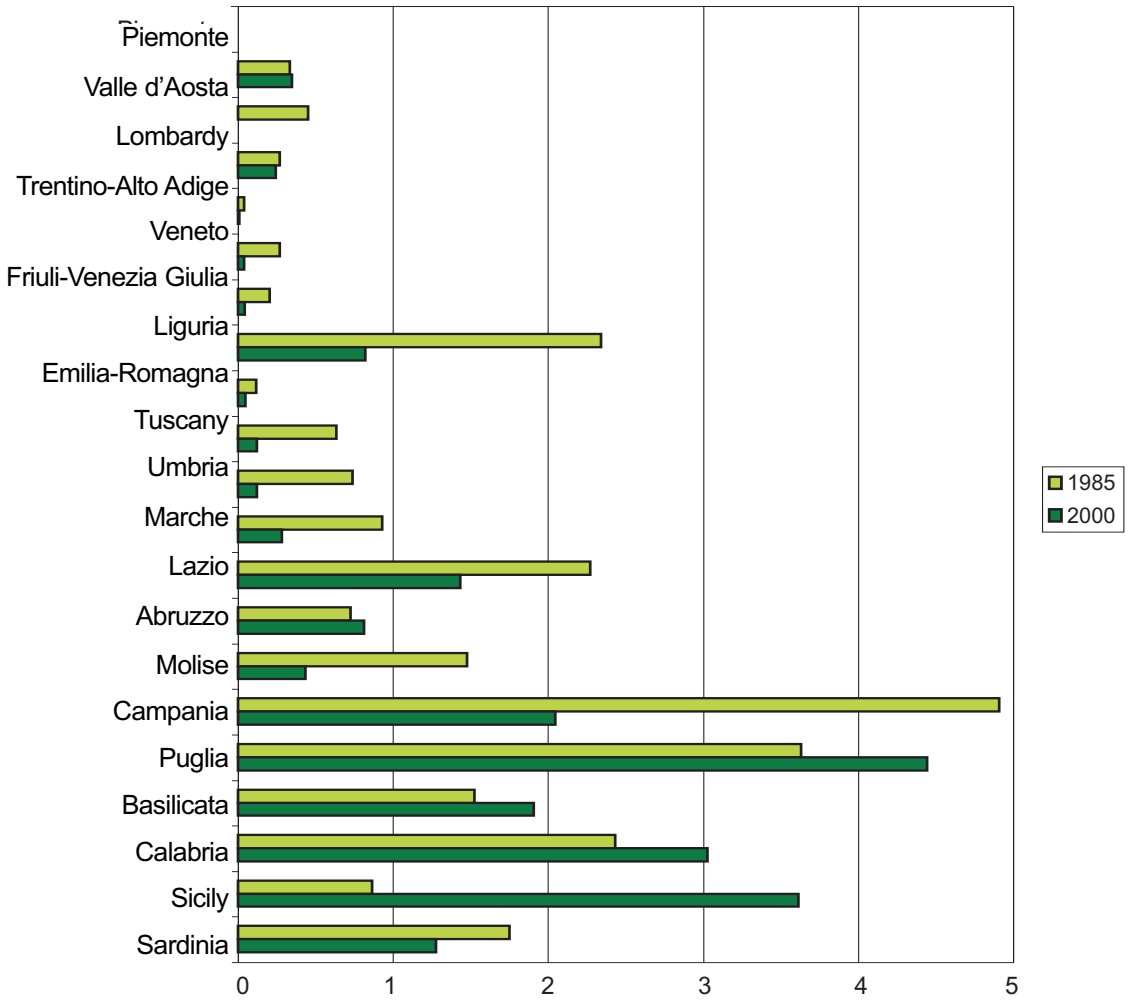
Forest fires are one of the main causes of degradation and destruction of Italy's forest heritage. Damage caused by fires is both direct and indirect. The first type concerns damage with immediate economic effects; the second regards environmental damage (changes in plant population, reduction in hydro-geological defence, a drain on landscape and tourist-recreation areas etc.). The indicator may be used as a proxy for loss of biodiversity, though it should be used in connection with information about the fragility of the ecosystems involved. It also gives information about the "response" to the phenomenon of fires, in terms of prevention and control.

From 1985 to 2000, almost 0.7% of Italy's wooded lands were affected by fire annually on average. Following a drop in 1995 and 1996 (2.2%), the figures for the indicator again began to rise, reaching levels that hovered between 0.7% and 0.9%. In 2000, the regions of the South and Islands recorded much higher figures (2.2% on average) compared to the Italian average of 0.87%. The worst-hit regions in 2000 were Puglia, Sicily and Calabria, with affected areas approximately 10 times those in most other regions of Italy. The area least affected was the North-East, with an average of 0.03% of wooded land affected by fire.

Wooded land affected by fire (1985=100)



Wooded land affected by fire (1985=100)



North-West	North-East	Centre	South & Islands	Italy
☹	😐	☹	☹	☹

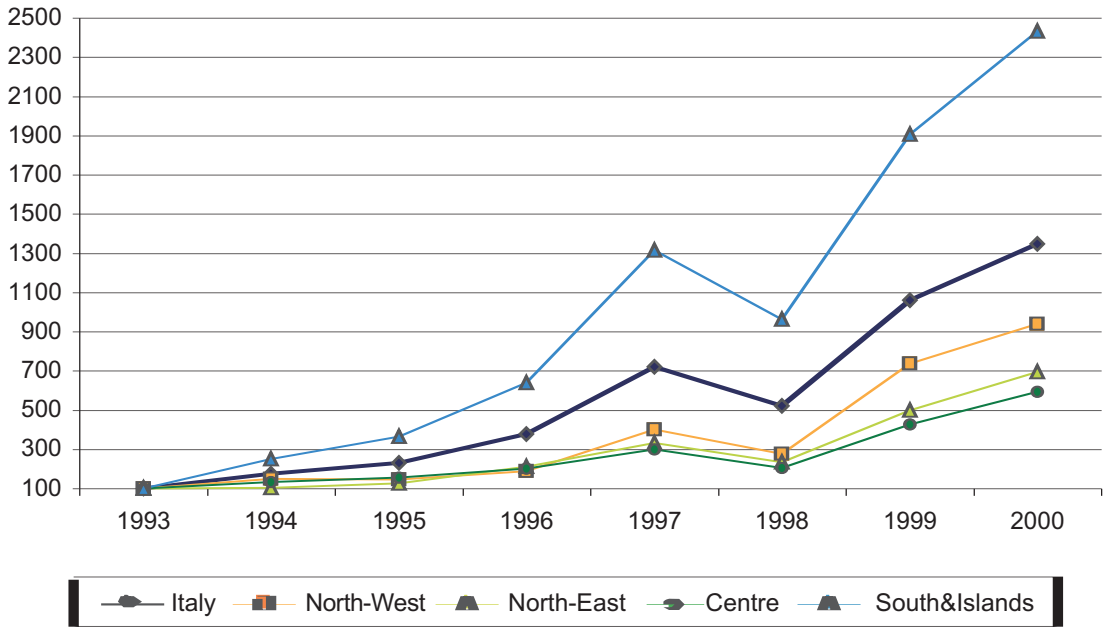
32. Organic farming

Organic farming is based on production methods that exclude the use of synthetic fertilisers, plant protection products, herbicides and genetically modified organisms, thus generating positive effects on biodiversity.

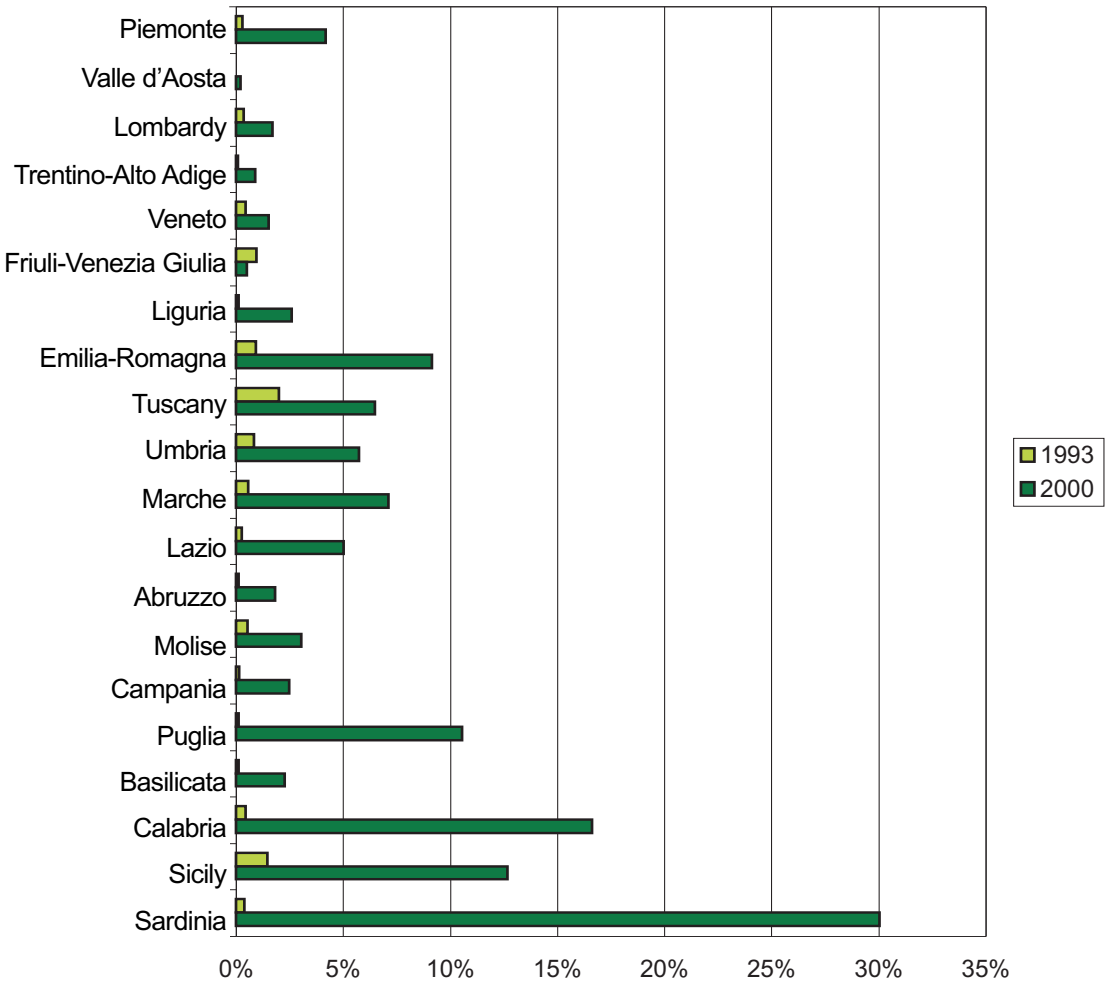
Since 1990, the increase in organically farmed land has been encouraged by several European Community regulations (EEC Reg. 866/90, EEC Reg. 2328/91, EEC Reg. 2078/92, EEC Reg. 2081/93 and EEC Reg. 2088/93). Reg. 1804/99 also extended the previous regulation (Reg. 2092/91) to livestock products for recognition of organic production.

Between 1993 and 2000, there was continuous growth in organic farming, in terms of both utilised area and number of farms. UAA for organic farming went from 0.6% to 8%, with an average annual increase of 38%. The greatest increases were in the South and Islands, especially Sardinia and Calabria. There were reductions in Friuli Venezia Giulia. Along with increases in land, there was a parallel increase, especially in the South and Islands, in the number of organic farms (from 4,700 in 1993 to 54,000 in 2000).

Organic farming share of UAA (1993=100)



Organic farming share of UAA



North-West	North-East	Centre	South & Islands	Italy
☺	☺	☺	☺	☺

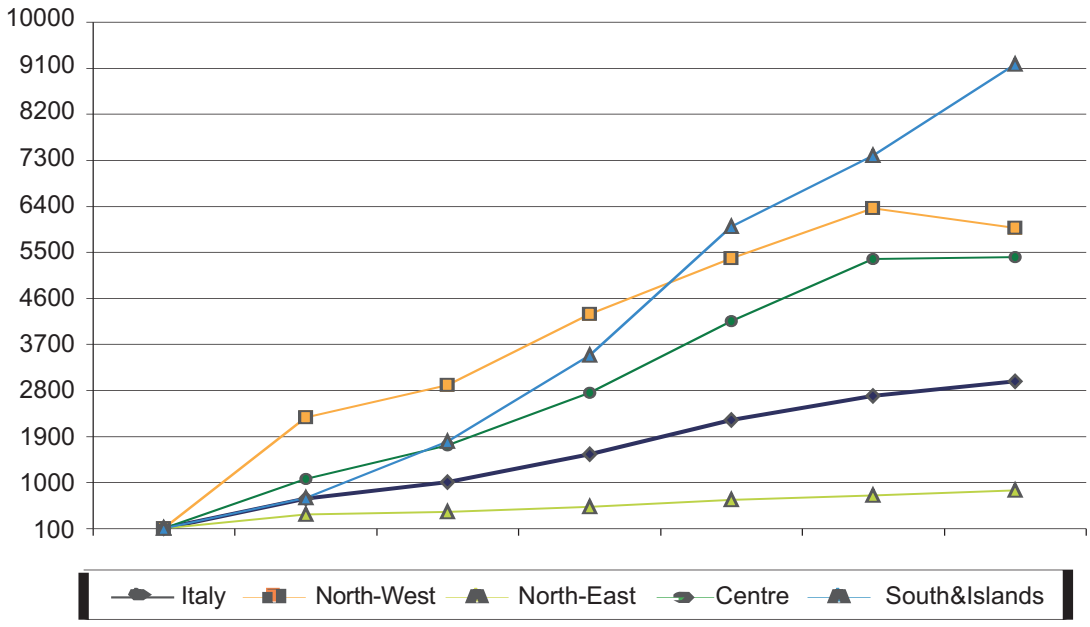
33. Agri-environmental measures

Agri-environmental measures are one possible response for improving the impact of agriculture on the environment. They increase environmental value of agricultural areas, with positive effects for conservation of biodiversity.

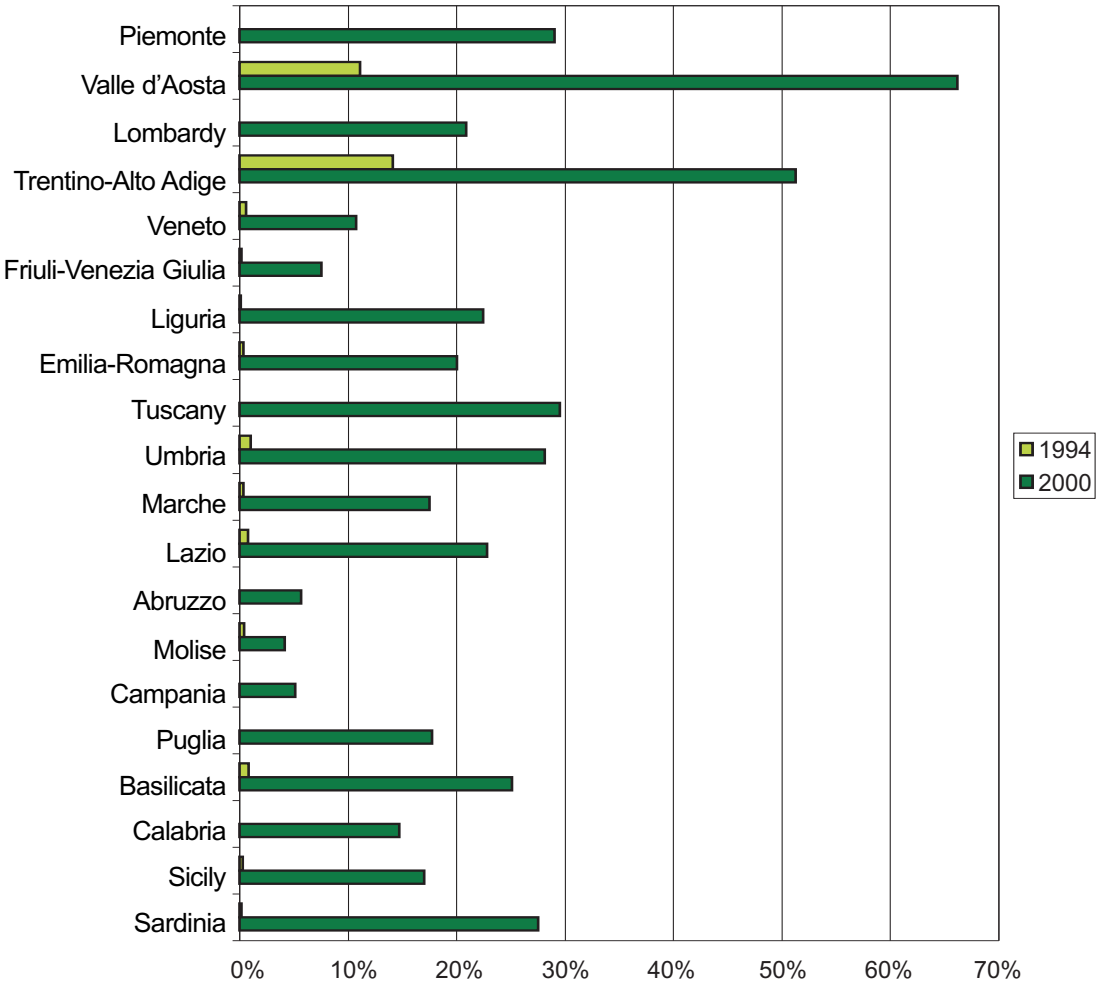
The regulation governing agri-environmental measures (EEC Reg. 2078/92), replaced by measure F in the Rural Development Programmes (EEC Reg. 1257/99), aims on the one hand to limit the risks of pollution from agriculture by encouraging less intensive production; on the other hand, it seeks to provide incentives for creating positive external effects, like protecting biodiversity and improving landscape.

The adoption of agri-environmental measures has increased considerably. In 2000, the areas affected had reached 2,748,914 hectares, or 21% of national UAA. At the same time, the number of recipients rose over the period of analysis from 14,000 to 194,000. The greatest increases in UAA affected by agri-environmental measures occurred in the South and Islands, with an annual rate of variation above the national average, equal to 91%; next came the regions of the North-West (80%), the Centre (77%) and the North-East (36%). Regionally speaking, the greatest average annual increases occurred in Campania, Liguria and Sardinia, whereas Valle d'Aosta and Trentino Alto Adige had the greatest amount of UAA.

Share of UAA affected by agri-environmental measures (1994=100)



Share of UAA affected by agri-environmental measures



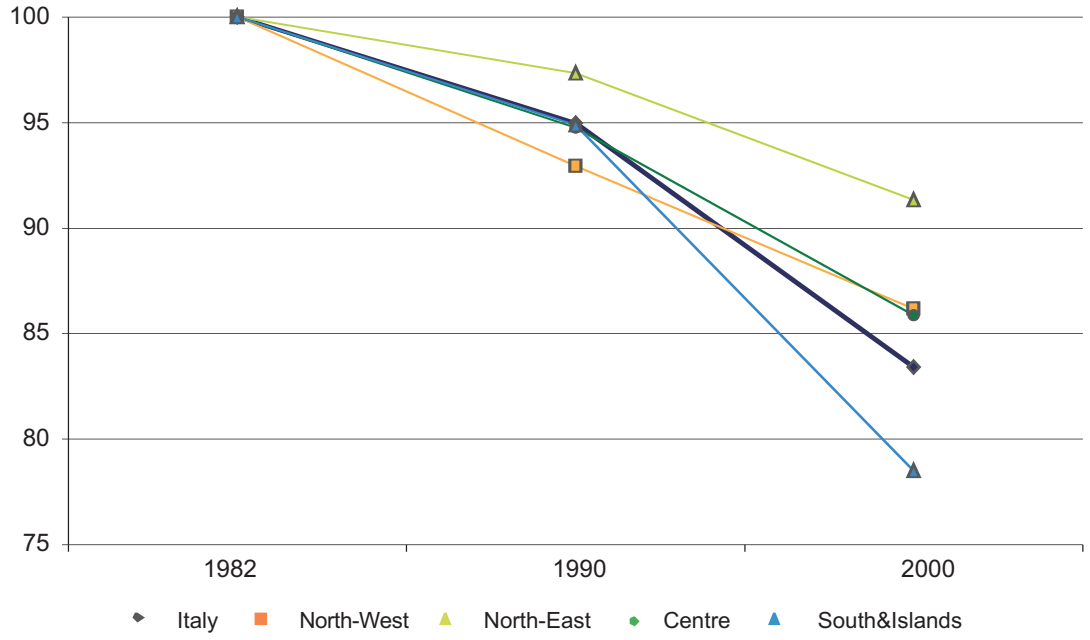
North-West	North-East	Centre	South & Islands	Italy
☺	☺	☺	☺	☺

34. Utilised Agricultural Area

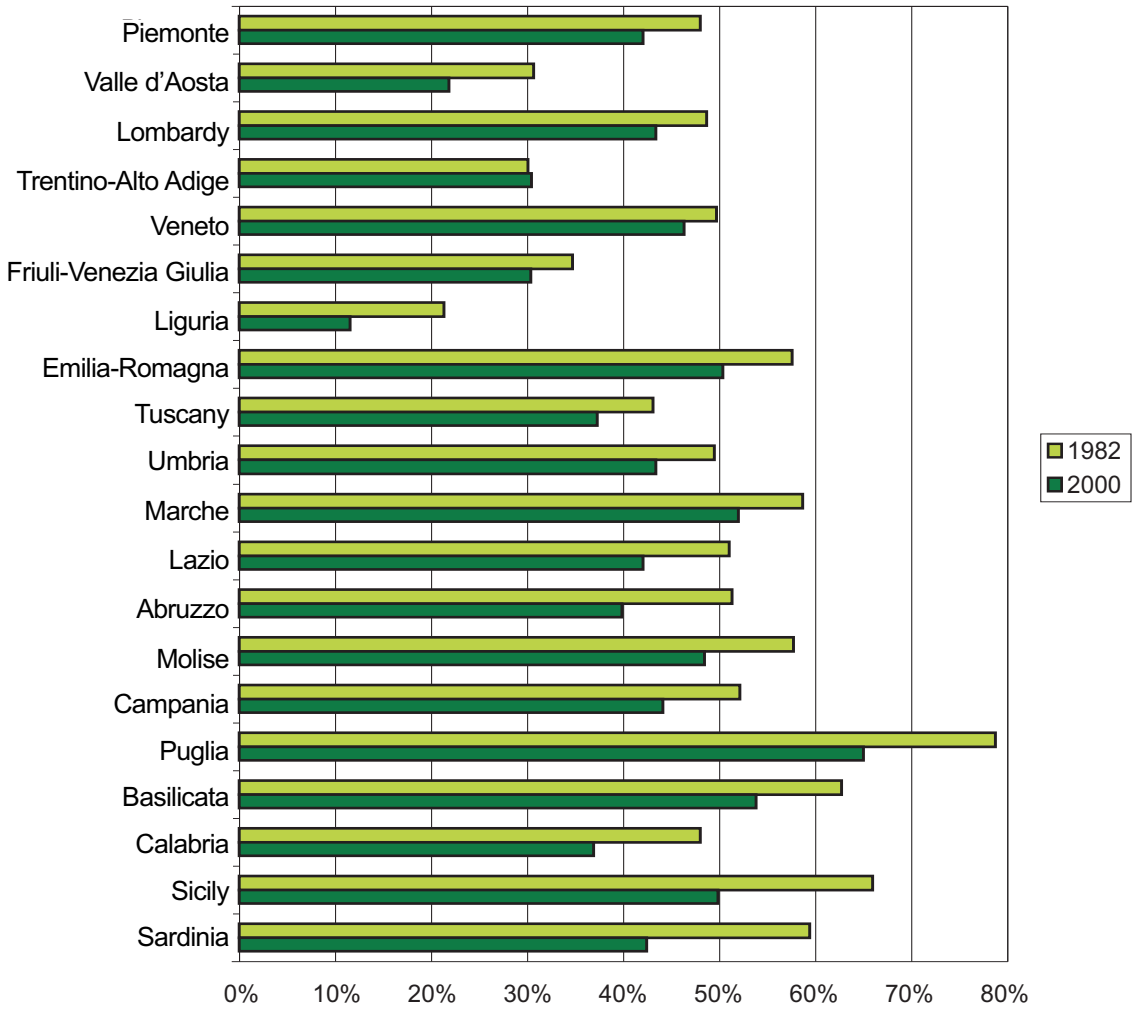
Variations on the impact of UAA on Italian territory involve changes to the landscape, agriculture being the main user of land. This indicator refers to the structure of landscape and concerns the portion of land utilised for agriculture.

Between 1982 and 2000, the amount of UAA in Italy dropped by 16.6%, from 53% to 44% of national territory. By geographical area, the smallest decrease was in the North-East (-8.7%), whereas the greatest drop was in the regions of the South and Islands (-21.5%), though these regions retain the largest amount of land occupied by UAA. The regions with the highest percentages of UAA per total area are Puglia (65%), Basilicata (54%), Marche (52%) and Emilia Romagna (50%), while the lowest percentages were in the North: Liguria (12%) and Valle d'Aosta (22%).

Utilised Agricultural Area (1982=100)



Utilised Agricultural Area



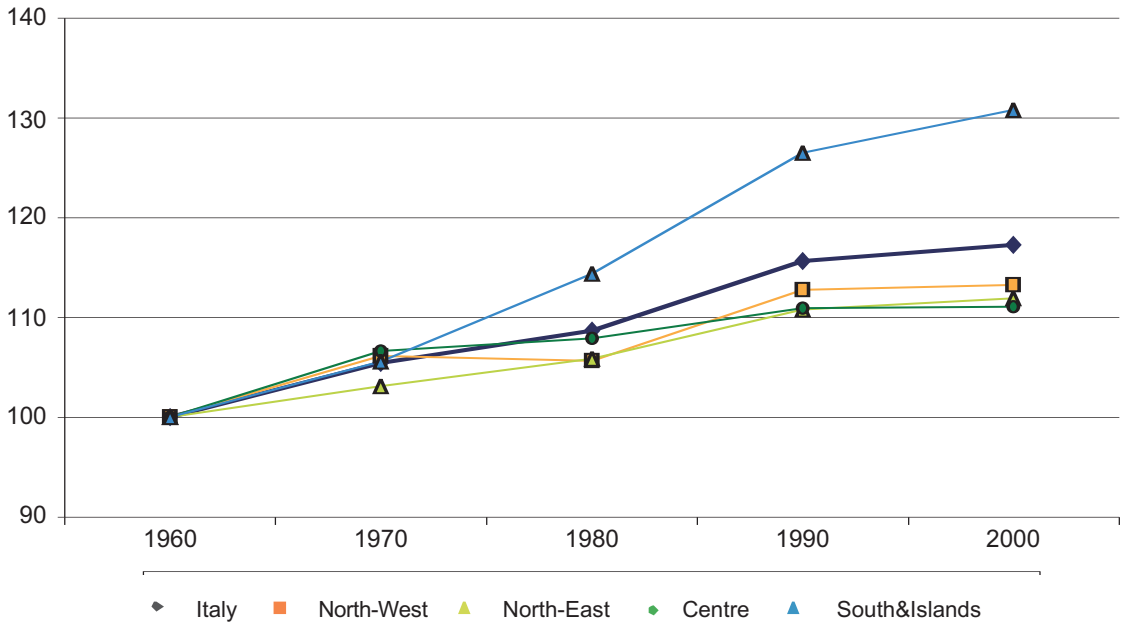
North-West	North-East	Centre	South & Islands	Italy
☹	☹	☹	☹	☹

35. Afforestation index

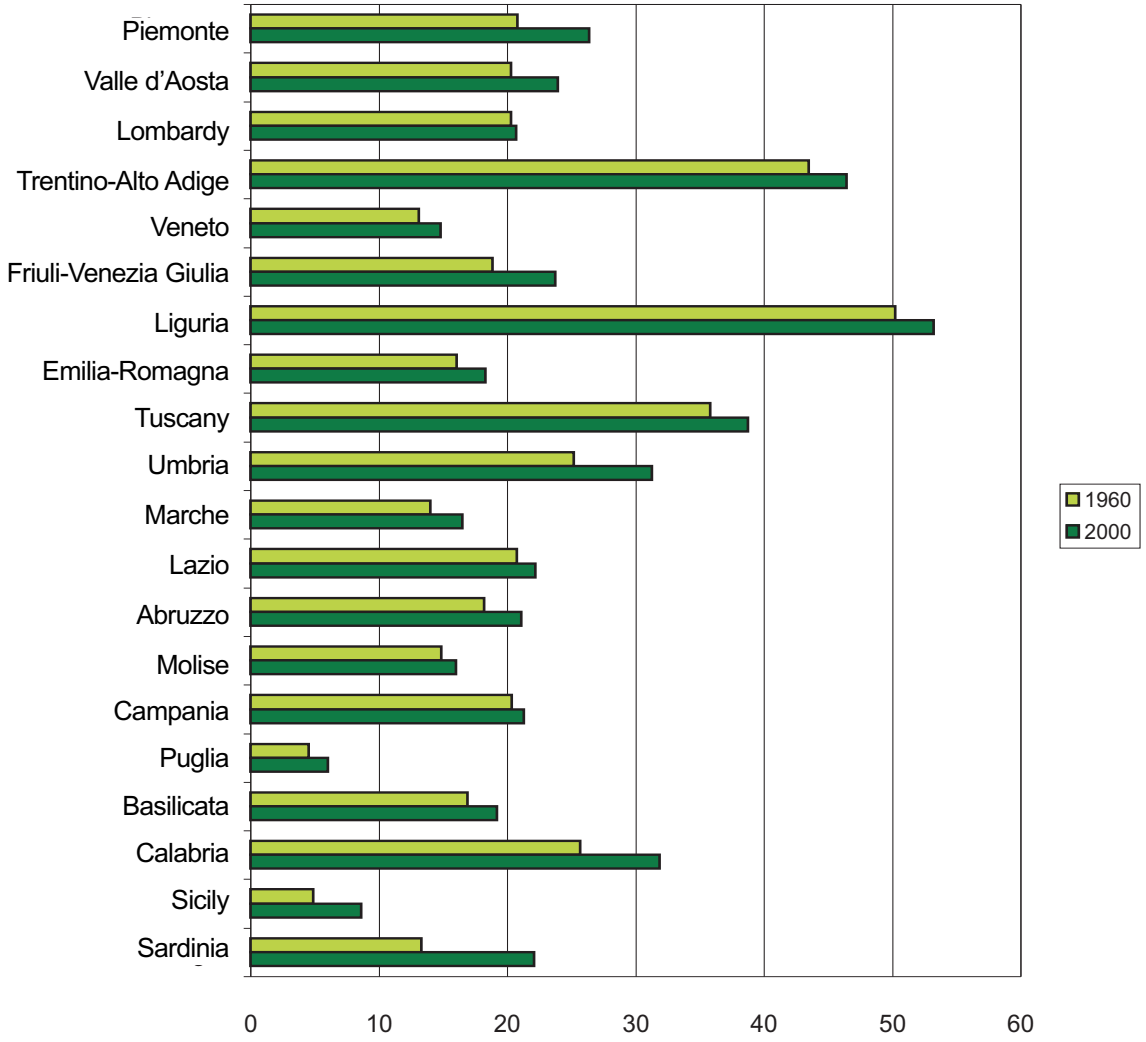
Forests play a major role in biodiversity conservation and hydro-geological protection, and thus in defining certain environmental conditions that contribute to the makeup of the landscape. They are therefore one of the basic elements of landscape structure, and important for the development of economic, tourist-recreational and residential activities.

Wooded land in Italy amounts to 6,853,808 hectares, located mainly in the regions of the North, especially Tuscany, Piemonte and Trentino Alto Adige. The afforestation index is 22.7%, a lower figure than the European average, despite the fact that Italy is made up mostly of mountains and hills. The highest values are for Liguria, Trentino Alto Adige and Tuscany. From 1960 to 2000, wooded land increased by over a million hectares, thanks to replanting, and also to the natural afforestation of abandoned agricultural land. The greatest increases were in the South and Islands (30%), especially Sicily, Sardinia and Puglia, with an annual variation of 0.87%. The breakdown by type of timber shows a prevalence of coppice (52.8% of total wooded land), followed by high timber (43.3%) and Mediterranean scrub (3.9%).

Afforestation index (1960=100)



Afforestation index

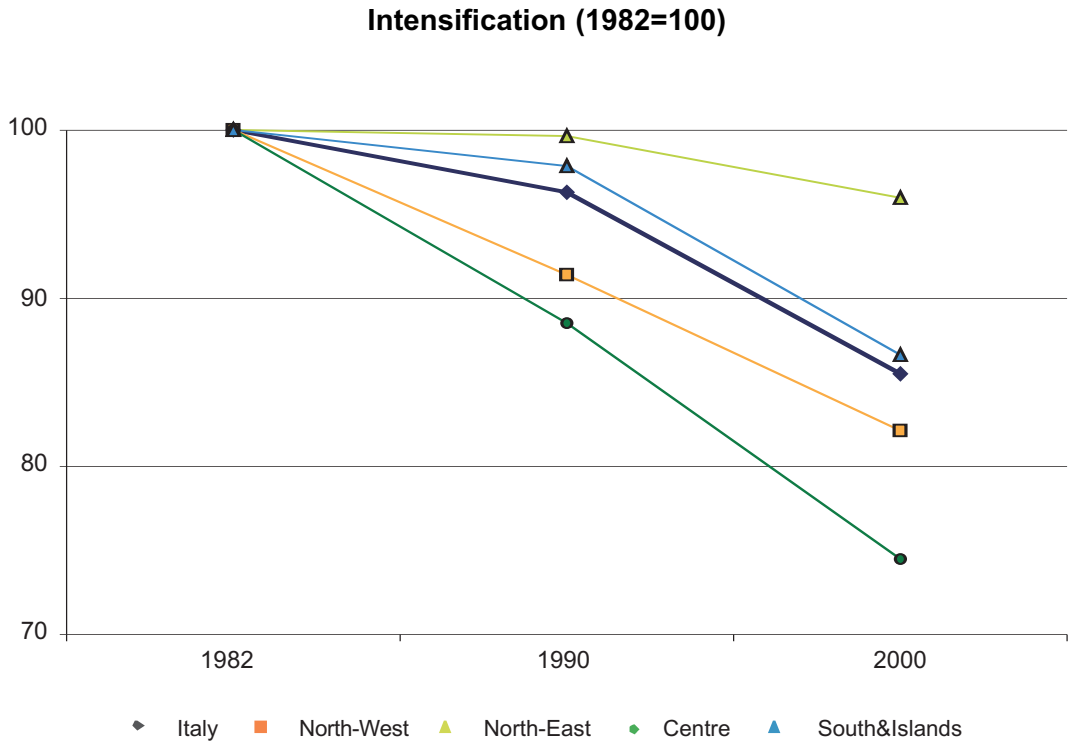


North-West	North-East	Centre	South & Islands	Italy
☺	☺	☺	☺	☺

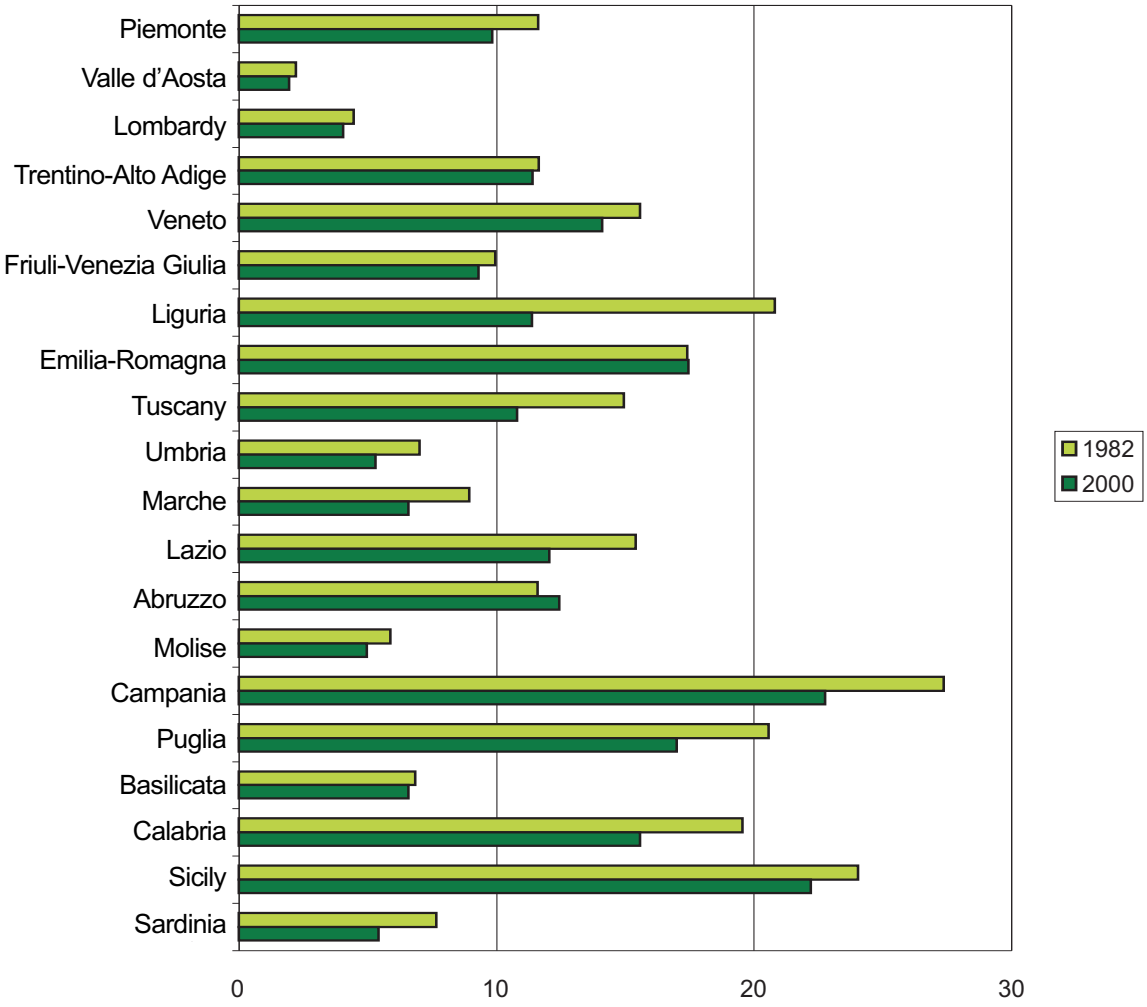
36. Intensification

Management methods in agriculture influence the characteristics of agri-ecosystems, and thus of the agrarian landscape. This indicator can be used to monitor the evolution of the agrarian landscape in connection with forms of intensive agriculture, a farm management method that involves high inputs per land unit and farming practices that may cause negative environmental effects. The indicator may also be used to gather information on the extent of soil exploitation.

From 1982 to 2000, the process of intensification slowed, with a reduction of 14% in UAA devoted to intensive crops. Figures higher than the national average (12.5%) were recorded in the North-East and the South and Islands. For the regions, the greatest yearly rates of reduction occurred in Liguria, Tuscany and Sardinia, whereas the largest areas of intensive farming were in Campania and Sicily.



Intensification

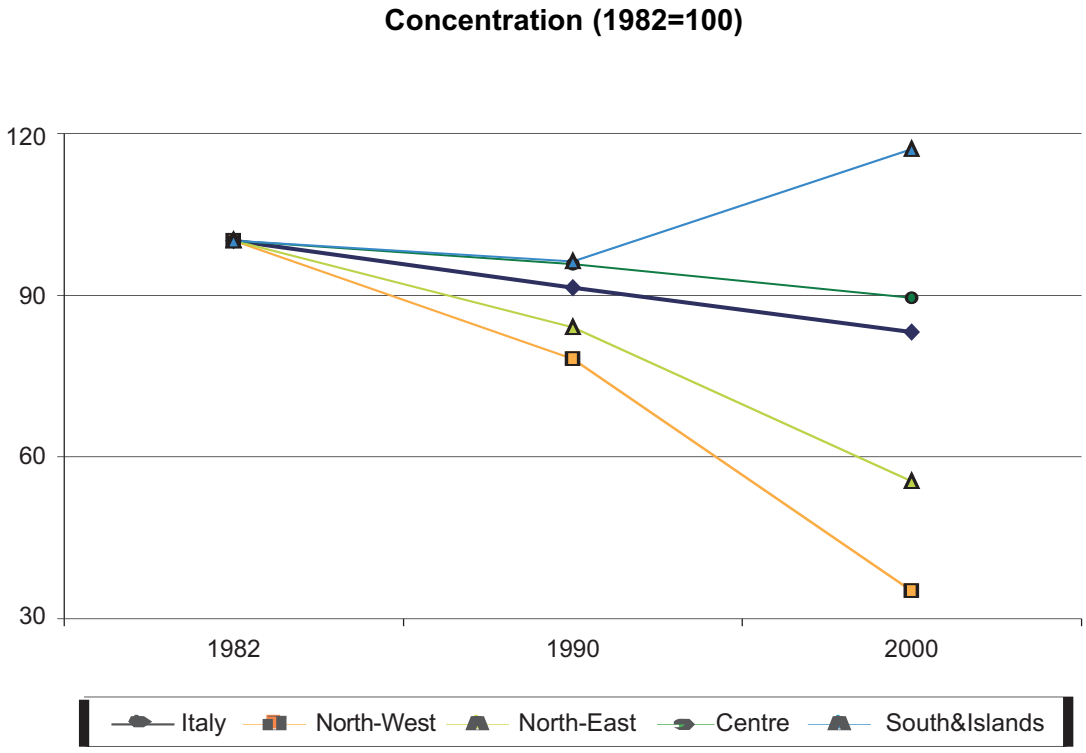


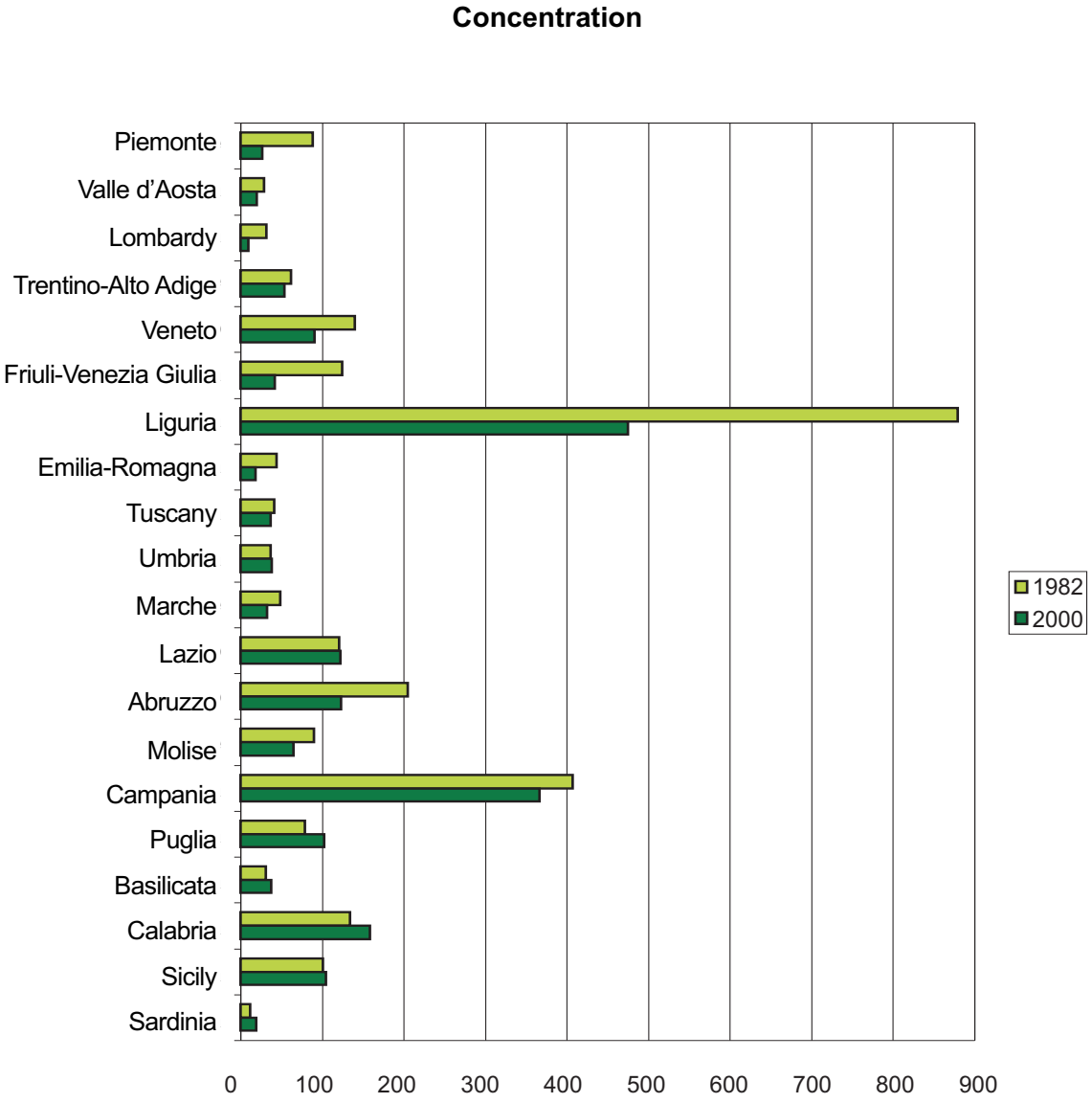
North-West	North-East	Centre	South & Islands	Italy
☺	☺	☺	☺	☺

37. Concentration

The various setups of agricultural structure affect the shape of the landscape. Concentration of production refers to the decline in number of farms, a phenomenon often accompanied on the one hand by an increase in average size, and on the other by a decline in the number of small farms, resulting in the abandonment of the countryside and loss of agrarian landscape.

The number of farms dropped between 1982 and 2000 by nearly 700,000, or more than 20%. This decline mainly affected smaller farms (< 5 ha), which dropped at an average annual rate of 10% compared to larger farms (> 50 ha). The phenomenon especially affected the North-West and North-East; in the Centre, the value of the indicator was reduced at a much more modest rate; contrarily, in the South and Islands it increased, with the highest percentages in Sardinia, Puglia and Basilicata.





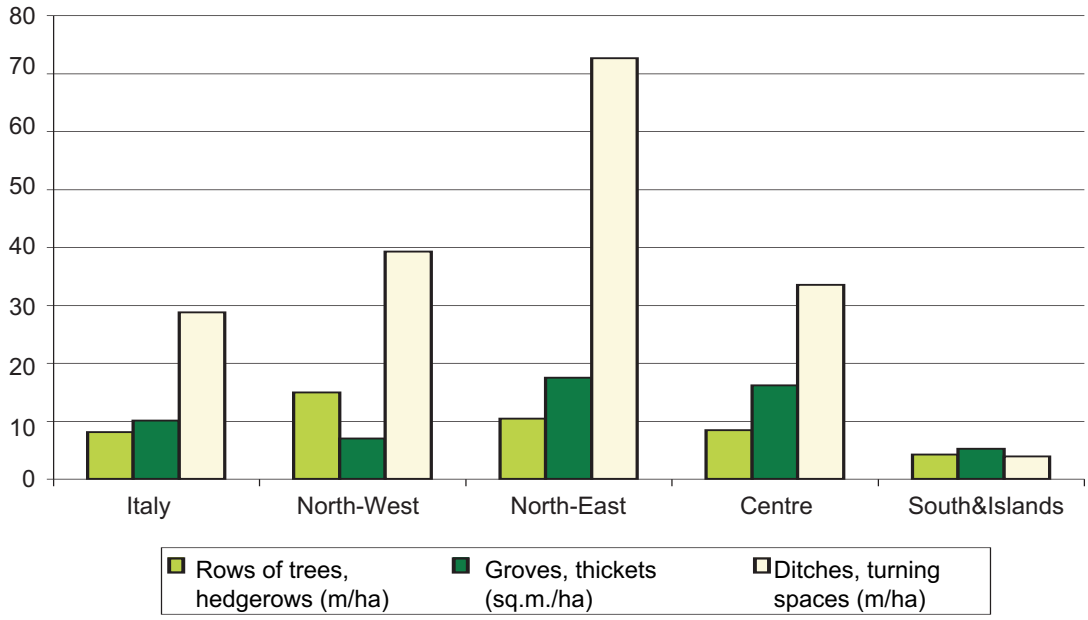
North-West	North-East	Centre	South & Islands	Italy
☹	☹	☹	☺	☹

38. Man-made and natural elements

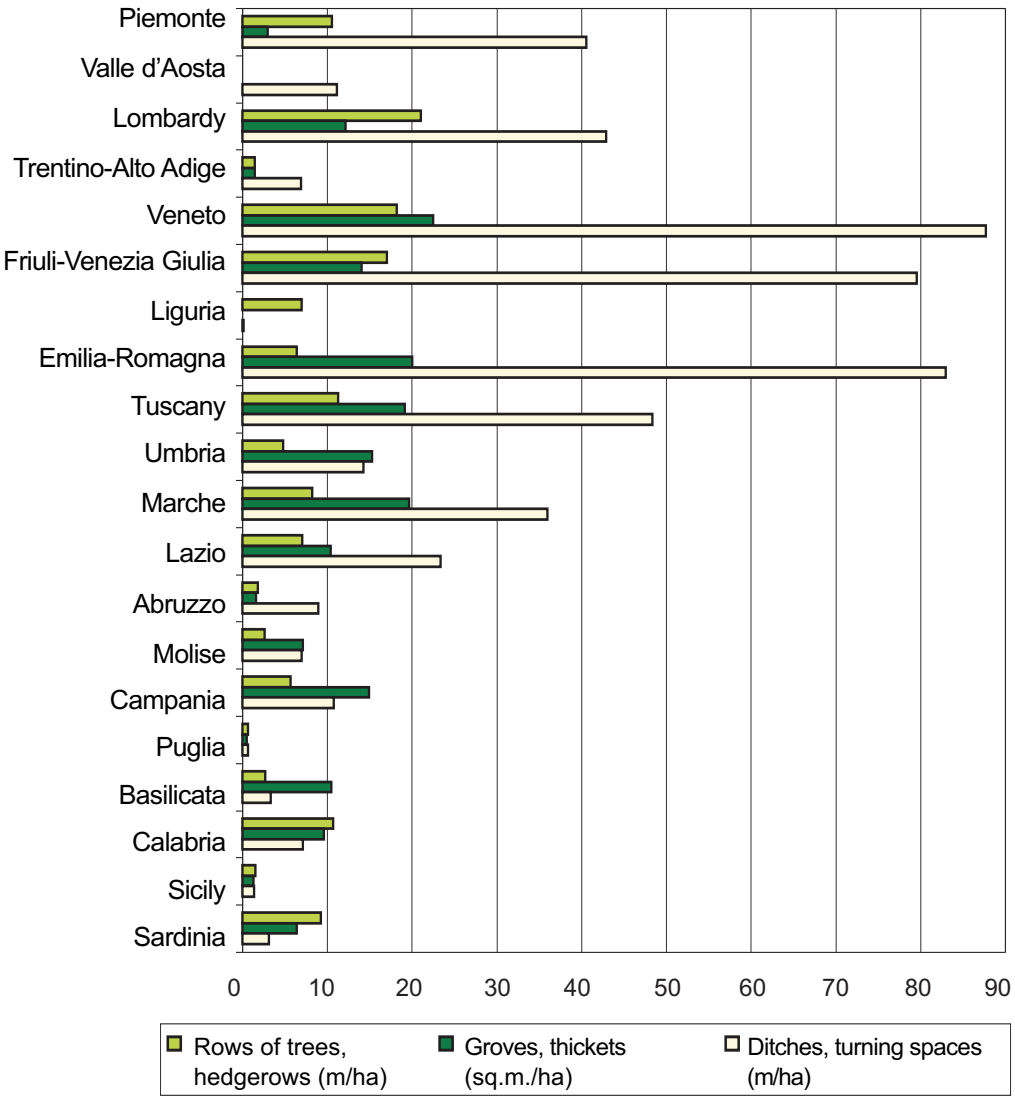
Natural elements, like rows of trees, hedgerows, groves and thickets, and man-made elements like ditches and turning spaces, contribute to the diversity of the landscape, and in some cases to its cultural identity. Little wooded formations (groves, thickets), rows of trees and hedgerows also play a role in conserving biodiversity.

In 1998, there were approximately 28 metres of ditches and turning spaces per surface unit, and 8 metres of rows of trees and hedgerows. Rows of trees and hedgerows were denser than average in the North-West (approximately 15 m/ha) and North-East (10 m/ha), especially in Lombardy, Veneto and Friuli Venezia Giulia; ditches and turning spaces were prevalent in the North-East. Small wooded areas were found mainly in the North-East (17 sq.m./ha) and Centre (16 sq.m./ha), with the largest expanses in Veneto, Marche and Tuscany.

Man-made and natural elements



Man-made and natural elements



North-West	North-East	Centre	South & Islands	Italy
☺	☺	☺	☹	☺

APPENDIX 1
TABLES

Tab. 1 - Agricultural employment

Percentage share of people employed in agriculture in total employed

Region	Year										R of I
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	1991-2000
Piemonte	6,70	6,44	6,58	6,16	5,23	4,99	5,14	4,09	3,77	3,84	*-5,43*
Valle d'Aosta	9,43	9,43	9,62	7,84	7,84	9,80	7,69	5,77	5,77	6,16	*-4,18*
Lombardy	3,11	3,00	2,61	3,05	3,28	2,94	2,78	2,20	2,09	2,07	*-3,98*
Trentino-Alto Adige	10,54	9,79	8,42	8,53	9,35	10,13	9,80	9,23	8,85	8,81	*-1,78*
Veneto	7,29	6,47	6,07	6,50	5,88	5,42	5,41	4,63	4,61	4,52	*-4,68*
Friuli-Venezia Giulia	5,46	4,89	4,19	4,63	5,19	4,48	4,93	4,48	4,01	2,83	*-6,38*
Liguria	4,43	3,72	3,19	3,87	4,18	4,32	3,99	3,25	3,41	3,26	*-3,02*
Emilia-Romagna	8,77	8,54	7,62	8,68	8,49	7,46	7,14	6,81	6,71	5,90	*-3,89*
Tuscany	5,31	4,58	4,15	4,84	4,48	3,82	4,21	3,82	3,16	3,77	*-3,36*
Umbria	8,81	8,04	7,54	7,43	7,07	6,71	6,67	6,27	5,10	4,51	*-6,46*
Marche	9,73	8,98	8,85	8,45	7,65	7,18	6,91	5,30	4,81	4,12	*-8,24*
Lazio	4,56	4,58	4,09	4,82	4,50	4,46	4,40	3,17	3,08	3,19	*-3,52*
Abruzzo	11,63	10,17	9,28	9,91	8,37	8,67	8,07	7,00	6,65	5,44	*-7,31*
Molise	19,66	21,49	20,35	20,56	16,98	17,14	16,04	13,21	12,26	11,46	*-5,25*
Campania	11,98	11,34	10,48	11,44	11,30	10,72	10,58	8,91	7,81	6,98	*-5,26*
Puglia	16,34	15,92	14,67	15,36	14,04	13,28	12,87	12,37	11,41	11,54	*-3,42*
Basilicata	20,21	18,13	17,03	17,98	16,76	15,70	15,20	15,34	13,97	11,27	*-5,67*
Calabria	19,09	20,44	17,06	17,14	16,79	15,88	14,78	12,57	12,24	11,89	*-4,63*
Sicily	14,14	14,68	13,52	13,50	13,14	12,31	12,14	10,32	9,73	9,98	*-3,43*
Sardinia	14,31	13,52	12,25	12,70	12,91	12,27	12,40	9,65	8,75	9,16	*-4,36*
Italy	***8,44***	***8,15***	***7,39***	***7,81***	***7,44***	***6,97***	***6,83***	***5,88***	***5,48***	***5,31***	***-4,53***
- North-West	*4,31*	*4,10*	*3,85*	*4,05*	*3,95*	*3,71*	*3,60*	*2,86*	*2,71*	*2,71*	*-4,53*
- North-East	*7,96*	*7,41*	*6,69*	*7,33*	*7,13*	*6,53*	*6,42*	*5,87*	*5,74*	*5,26*	*-4,05*
- Centre	*5,84*	*5,44*	*5,03*	*5,52*	*5,12*	*4,80*	*4,86*	*3,91*	*3,50*	*3,61*	*-4,68*
- South & Islands	*14,57*	*14,41*	*13,11*	*13,60*	*12,98*	*12,32*	*11,98*	*10,45*	*9,65*	*9,34*	*-4,36*

Source: INEA calculations using ISTAT figures, Forze di lavoro, various years.

Tab. 2 - Ageing index for farmers

Percentage share of farmers aged 65 and over in total farmers

Region	Year							R of I
	1993	1995	1996	1997	1998	1999	2000	1993-2000
Piemonte	36,90	33,51	35,55	37,16	36,77	35,32	38,07	*0,45*
Valle d'Aosta	26,45	34,95	31,43	35,78	26,14	33,64	34,13	*3,71*
Lombardy	34,17	31,11	27,70	37,10	36,55	34,59	32,63	*-0,65*
Trentino-Alto Adige	26,65	24,93	28,32	27,21	22,94	27,04	29,07	*1,25*
Veneto	34,89	35,13	39,14	39,09	41,56	41,25	39,57	*1,81*
Friuli-Venezia Giulia	31,97	34,52	21,35	33,22	40,43	31,69	39,03	*2,89*
Liguria	31,77	35,14	47,80	21,42	33,34	31,39	42,47	*4,23*
Emilia-Romagna	39,56	37,94	35,22	41,00	40,84	40,83	42,16	*0,91*
Tuscany	37,51	37,65	38,04	38,19	43,21	40,64	42,46	*1,79*
Umbria	41,39	40,46	43,05	46,15	43,85	47,81	43,08	*0,57*
Marche	36,30	38,41	40,39	44,68	44,20	42,62	45,02	*3,13*
Lazio	30,64	35,40	38,90	41,27	41,96	42,50	36,60	*2,57*
Abruzzo	38,97	36,80	40,01	40,67	43,52	42,85	39,69	*0,26*
Molise	33,34	37,39	32,20	44,65	40,59	37,86	37,32	*1,63*
Campania	36,18	38,21	41,29	37,42	39,19	38,71	36,99	*0,31*
Puglia	32,09	35,79	33,44	33,80	37,55	39,02	35,12	*1,29*
Basilicata	35,00	38,41	43,57	40,84	42,43	41,06	38,14	*1,24*
Calabria	32,56	33,54	32,19	41,36	43,29	43,05	38,58	*2,46*
Sicily	31,84	44,51	39,56	43,43	46,89	45,06	41,12	*3,72*
Sardinia	37,41	36,95	49,02	32,09	34,66	35,21	36,60	*-0,31*
Italy	***34,36***	***36,93***	***37,39***	***38,69***	***40,69***	***40,18***	***38,41***	***1,60***
- North-West	*35,08*	*32,92*	*34,31*	*35,01*	*35,94*	*34,46*	*37,12*	*0,81*
- North-East	*35,10*	*34,80*	*34,82*	*37,57*	*39,01*	*38,29*	*38,62*	*1,37*
- Centre	*34,75*	*37,13*	*39,39*	*41,73*	*42,89*	*42,71*	*40,25*	*2,12*
- South & Islands	*33,85*	*38,43*	*38,28*	*38,88*	*41,54*	*41,15*	*37,98*	*1,66*

Source: INEA calculations using ISTAT figures, Struttura e produzioni delle aziende agricole, various years; Censimento generale dell'agricoltura, 2003.

Tab. 3 - Educational level of farmers

Percentage breakdown of farmers by level of education

Region	Year														
	1990					1995					1997				
	University	High School	Middle School	Elementary School	No certificate	University	High School	Middle School	Elementary School	No certificate	University	High School	Middle School	Elementary School	No certificate
Piemonte	1,69	6,60	15,88	71,61	4,22	0,81	8,01	24,43	64,57	2,18	2,49	9,19	24,05	58,02	2,91
Valle d'Aosta	0,63	5,90	16,69	73,44	3,33	0,07	8,45	35,06	56,14	0,28	1,42	8,46	22,03	67,97	0,12
Lombardy	2,04	7,35	16,17	70,80	3,64	1,78	8,41	24,71	63,01	2,08	5,35	11,65	21,12	60,99	0,89
Trentino-Alto Adige	1,39	6,36	20,92	70,68	0,65	0,60	10,83	32,26	55,85	0,46	2,26	13,74	29,49	53,46	1,06
Veneto	1,27	4,98	14,09	70,12	9,55	1,13	5,77	23,23	63,51	6,36	1,39	8,11	21,89	64,88	3,74
Friuli-Venezia Giulia	0,89	5,38	15,79	71,22	6,72	1,19	3,76	26,49	64,64	3,91	2,09	3,42	24,48	69,15	0,87
Liguria	2,06	8,03	16,77	66,92	6,22	1,27	7,47	22,43	66,86	1,97	0,90	19,70	25,72	52,95	0,72
Emilia-Romagna	2,89	7,99	14,68	60,92	13,51	3,14	10,59	19,32	62,02	4,93	4,06	10,53	21,15	60,19	4,07
Tuscany	3,87	9,27	14,76	61,15	10,95	4,02	9,52	20,14	58,67	7,64	3,37	14,17	23,02	52,67	6,76
Umbria	3,93	10,03	16,52	55,28	14,24	4,47	10,31	20,51	49,56	15,15	5,29	13,28	22,77	48,53	10,13
Marche	3,00	7,02	12,55	61,84	15,59	2,50	8,20	17,75	64,71	6,83	4,70	10,79	14,03	61,59	8,89
Lazio	2,05	7,55	18,55	56,74	15,11	2,34	9,11	23,12	53,83	11,60	2,40	8,56	24,43	57,50	7,11
Abruzzo	1,36	5,03	13,93	57,29	22,39	1,80	7,31	16,38	56,54	17,96	1,90	8,61	21,10	51,24	17,15
Molise	1,64	4,55	12,29	53,75	27,76	2,31	4,32	13,59	60,08	19,69	1,54	7,55	14,38	61,46	15,07
Campania	1,69	4,75	17,05	49,73	26,77	1,66	4,78	20,08	56,01	17,46	1,63	8,34	20,86	51,80	17,37
Puglia	2,88	6,52	16,97	51,80	21,82	3,76	7,38	20,26	52,79	15,81	3,32	8,82	21,35	53,11	13,40
Basilicata	1,62	5,05	11,33	48,62	33,38	1,15	5,23	23,24	46,36	24,01	1,70	5,65	16,29	55,22	21,14
Calabria	2,18	5,38	16,03	43,54	32,87	2,21	7,58	20,97	47,98	21,27	2,38	6,93	15,68	53,38	21,63
Sicily	3,52	7,15	16,03	48,59	24,71	4,12	7,81	24,02	42,95	21,10	3,32	8,18	25,11	47,63	15,75
Sardinia	1,67	5,01	17,65	52,74	22,92	1,02	5,54	22,04	56,67	14,73	1,77	9,38	24,40	50,50	13,94
Italy	***2,33***	***6,48***	***15,99***	***57,04***	***18,15***	***2,45***	***7,45***	***21,90***	***55,30***	***12,91***	***2,78***	***9,13***	***21,88***	***55,03***	***11,01***
- North-West	*1,85*	*7,08*	*16,15*	*70,56*	*4,37*	*1,18*	*8,09*	*24,53*	*64,12*	*2,08*	*3,34*	*11,49*	*23,10*	*58,75*	*1,78*
- North-East	*1,73*	*6,11*	*15,33*	*67,54*	*9,29*	*1,71*	*7,62*	*23,38*	*62,32*	*4,97*	*2,39*	*8,92*	*22,87*	*62,66*	*3,17*
- Centre	*2,91*	*8,22*	*16,34*	*58,59*	*13,93*	*3,08*	*9,21*	*21,08*	*56,51*	*10,12*	*3,39*	*10,86*	*21,99*	*56,06*	*7,71*
- South & Islands	*2,45*	*5,87*	*16,05*	*49,84*	*25,79*	*2,77*	*6,71*	*21,10*	*50,70*	*18,72*	*2,59*	*8,16*	*21,28*	*51,55*	*16,41*

Source: INEA calculations using ISTAT figures, Struttura e produzioni delle aziende agricole, various years.

(continued)

Tab. 3 - Educational level of farmers *(continued)*

Percentage breakdown of farmers by level of education

Region	Year									
	1998					1999				
	University	High School	Middle School	Elementary School	No certificate	University	High School	Middle School	Elementary School	No certificate
Piemonte	1,89	10,72	26,46	58,02	2,91	2,77	8,59	28,85	57,47	2,32
Valle d'Aosta	1,02	6,30	29,04	63,64		1,02	12,00	17,43	69,35	0,19
Lombardy	2,96	15,54	25,45	54,99	1,06	2,97	11,55	28,46	54,44	2,58
Trentino-Alto Adige	2,15	13,41	36,52	46,72	1,20	2,08	10,90	41,41	45,60	0,01
Veneto	2,11	7,73	22,55	62,76	4,85	2,00	8,57	25,00	58,59	5,85
Friuli-Venezia Giulia	0,98	10,76	21,59	58,18	8,49	1,45	12,03	26,85	54,57	5,11
Liguria	1,44	15,13	24,98	54,43	4,02	1,25	13,93	32,40	49,76	2,66
Emilia-Romagna	3,18	12,09	23,32	58,79	2,62	3,05	12,88	23,89	56,64	3,54
Tuscany	3,83	12,61	25,58	54,45	3,54	3,46	13,42	24,48	54,79	3,85
Umbria	4,27	13,82	25,12	47,77	9,01	6,01	14,39	21,95	51,21	6,45
Marche	3,89	11,88	16,24	59,76	8,24	3,46	11,01	19,57	58,11	7,85
Lazio	2,18	7,57	23,51	59,89	6,86	2,82	8,78	22,94	55,79	9,67
Abruzzo	2,31	8,27	18,89	52,50	18,03	1,98	9,25	20,35	54,86	13,57
Molise	2,34	4,99	22,19	50,59	19,90	3,71	8,17	21,05	48,39	18,68
Campania	2,09	9,51	20,55	53,14	14,71	2,85	8,24	20,92	55,01	12,98
Puglia	2,94	8,10	21,64	53,87	13,44	3,06	8,78	23,24	52,84	12,08
Basilicata	1,70	6,10	19,17	50,01	23,03	1,53	9,30	20,50	50,83	17,83
Calabria	2,46	6,82	17,17	49,89	23,65	3,17	8,57	17,41	49,15	21,70
Sicily	4,32	9,44	21,90	47,26	17,09	4,11	9,45	19,48	51,18	15,78
Sardinia	2,12	8,87	27,21	48,12	13,68	2,06	9,58	28,91	45,62	13,84
Italy	***2,76***	***9,52***	***22,46***	***53,93***	***11,32***	***2,96***	***9,74***	***23,21***	***53,52***	***10,57***
- North-West	*2,21*	*12,99*	*25,95*	*56,56*	*2,28*	*2,59*	*9,60*	*27,71*	*54,95*	*5,13*
- North-East	*2,31*	*10,11*	*24,33*	*59,09*	*4,16*	*2,27*	*10,59*	*26,85*	*55,95*	*4,34*
- Centre	*3,13*	*10,29*	*22,85*	*57,16*	*6,58*	*3,47*	*10,96*	*22,57*	*55,44*	*7,57*
- South & Islands	*2,91*	*8,38*	*21,02*	*50,78*	*16,91*	*3,09*	*8,95*	*21,13*	*51,74*	*15,09*

Source: INEA calculations using ISTAT figures, Struttura e produzioni delle aziende agricole, various years.

Tab. 4 - Breakdown of workers in agriculture

Difference between employment rates for men and women

Region	Year										Variation
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	1991/2000
Piemonte	1,27	1,29	1,46	1,42	1,19	0,76	0,89	1,24	1,22	1,10	-14,01
Valle d'Aosta	1,89	1,89	1,92	3,92	3,92	1,96	0,00	1,92	1,92	1,89	0,21
Lombardy	1,61	1,43	1,30	1,14	1,09	1,36	1,20	1,14	1,04	1,04	-35,49
Trentino-Alto Adige	5,91	5,15	4,21	3,88	4,16	4,56	4,77	4,24	4,42	3,87	-34,48
Veneto	3,40	2,88	2,62	2,69	2,22	2,35	2,38	2,15	2,28	2,00	-41,36
Friuli-Venezia Giulia	1,68	1,49	1,55	1,10	1,30	1,49	1,50	1,49	1,48	0,89	-47,19
Liguria	0,63	0,81	0,84	0,35	1,05	1,21	0,87	0,85	0,68	0,97	53,04
Emilia-Romagna	2,24	2,19	1,83	2,21	2,39	2,01	1,95	2,00	1,78	1,82	-18,49
Tuscany	1,96	1,62	1,24	1,56	1,25	1,18	1,40	1,32	1,01	1,35	-31,01
Umbria	3,77	2,89	2,95	3,38	2,36	2,01	2,00	2,31	1,91	2,07	-45,23
Marche	2,35	2,20	2,12	1,98	1,96	1,58	1,95	1,41	1,72	1,77	-24,76
Lazio	0,20	0,51	1,19	0,99	1,28	1,38	1,32	0,80	1,17	1,02	402,67
Abruzzo	3,17	2,81	1,58	2,07	1,58	1,11	0,90	1,58	1,61	1,22	-61,66
Molise	-0,85	0,00	0,88	0,00	0,00	0,00	0,94	0,00	0,94	0,58	-168,06
Campania	0,40	-0,23	-0,38	-0,32	0,27	-0,07	0,27	0,06	0,06	0,46	16,88
Puglia	3,05	2,47	3,33	3,58	3,05	3,14	3,64	4,07	4,60	4,04	32,47
Basilicata	-0,52	-0,52	-1,65	-1,12	0,58	1,74	1,17	1,70	0,56	0,79	-253,42
Calabria	0,10	-0,94	-0,68	0,88	1,09	1,89	2,11	2,59	2,45	2,20	2.099,78
Sicily	7,65	8,19	7,46	8,07	7,85	8,57	8,28	7,46	7,01	6,93	-9,39
Sardinia	9,91	9,07	7,83	7,86	7,99	7,36	8,33	6,50	6,42	6,71	-32,24
Italy	***2,35***	***2,15***	***2,03***	***2,12***	***2,10***	***2,13***	***2,18***	***2,06***	***2,03***	***1,98***	***-15,64***
- North-West	*1,42*	*1,34*	*1,31*	*1,17*	*1,14*	*1,18*	*1,07*	*1,15*	*1,07*	*1,05*	*-25,65*
- North-East	*2,98*	*2,66*	*2,34*	*2,44*	*2,36*	*2,33*	*2,34*	*2,21*	*2,19*	*1,98*	*-33,45*
- Centre	*1,34*	*1,28*	*1,46*	*1,49*	*1,44*	*1,38*	*1,49*	*1,17*	*1,25*	*1,31*	*-2,22*
- South & Islands	*3,50*	*3,16*	*2,94*	*3,30*	*3,39*	*3,52*	*3,73*	*3,51*	*3,49*	*3,44*	*-1,51*

Source: INEA calculations using ISTAT figures, Annuario statistico italiano, various years.

Tab. 5 - Resident population in rural municipalities

Percentage share of resident population in rural municipalities[(a)] in total population

Region	Year										
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Piemonte	20,77	20,85	20,90	20,97	21,03	21,04	21,09	21,09	21,13	21,16	21,71
Valle d'Aosta	48,72	49,00	49,68	49,98	50,16	50,46	50,65	50,89	51,09	51,21	51,41
Lombardy	7,97	7,97	7,97	7,97	8,11	8,11	8,10	8,09	8,10	8,08	8,24
Trentino-Alto Adige	50,93	51,06	51,08	51,18	51,30	51,37	51,44	51,46	51,46	51,45	51,85
Veneto	15,87	15,86	15,83	15,81	15,81	15,76	15,74	15,71	15,67	15,64	15,73
Friuli-Venezia Giulia	17,90	17,92	17,89	17,86	17,81	17,80	17,76	17,71	17,64	17,58	17,59
Liguria	14,83	15,03	15,12	15,12	15,17	15,23	15,30	15,37	15,43	15,47	15,44
Emilia-Romagna	26,00	26,02	26,08	26,13	26,16	26,16	26,16	26,15	26,12	26,07	26,27
Tuscany	17,66	17,72	17,78	17,85	17,89	17,89	17,88	17,88	17,86	17,87	18,17
Umbria	40,44	40,43	40,43	40,39	40,25	40,15	40,11	40,11	40,06	40,00	40,70
Marche	25,51	25,45	25,37	25,33	25,29	25,24	25,18	25,15	25,08	25,02	25,04
Lazio	13,02	13,07	13,24	13,32	13,36	13,39	13,35	13,37	13,34	13,32	13,83
Abruzzo	42,17	42,11	41,99	41,89	41,79	41,71	41,59	41,52	41,45	41,34	41,84
Molise	63,25	63,03	62,80	62,45	62,28	62,23	62,09	61,95	61,71	61,51	61,86
Campania	25,86	25,90	25,88	25,82	25,86	25,85	25,84	25,86	25,88	25,86	25,88
Puglia	59,18	59,29	59,41	59,48	59,52	59,55	59,63	59,69	59,71	59,74	60,27
Basilicata	75,49	75,41	75,34	75,19	75,03	74,92	74,40	74,30	74,14	74,02	73,72
Calabria	53,74	53,70	53,64	53,69	53,66	53,57	53,48	53,38	53,23	53,07	53,15
Sicily	45,85	45,88	45,83	45,42	45,34	45,31	45,21	45,18	45,15	45,12	45,45
Sardinia	48,65	48,63	48,59	48,51	48,47	48,23	48,21	48,23	48,10	48,06	48,43
Italy	***27,30***	***27,34***	***27,38***	***27,37***	***27,40***	***27,38***	***27,35***	***27,31***	***27,26***	***27,20***	***27,46***
- North-West	*26,22*	*26,29*	*26,30*	*26,30*	*26,50*	*26,53*	*26,52*	*26,54*	*26,61*	*26,56*	*27,85*
- North-East	*13,64*	*13,64*	*13,64*	*13,63*	*13,65*	*13,64*	*13,65*	*13,67*	*13,69*	*13,70*	*13,89*
- Centre	*12,54*	*12,55*	*12,61*	*12,61*	*12,61*	*12,62*	*12,60*	*12,60*	*12,58*	*12,60*	*12,77*
- South & Islands	*56,87*	*57,00*	*57,07*	*57,13*	*57,17*	*57,11*	*57,07*	*56,99*	*56,86*	*56,71*	*56,71*

Source: INEA calculations using ISTAT figures, Movimento anagrafico dei comuni, various years.

Note:

[(a)] Rural municipalities are defined as those with population density of <100 inhabitants per sq.km., or a percentage share of agricultural employment in total employment of >12.4 (twice the European Community average) reported in the 1991 census. The number of municipalities thus remains the same over the period under consideration.

Tab. 6 - Profitability of labour

Ratio between value added of agriculture, forestry and fishing, at basic prices, to work units in agriculture ('000 eurolira 1995)

Region	Year						R of I
	1995	1996	1997	1998	1999	2000	1995-2000
Piemonte	21,02	22,21	23,18	24,50	27,12	25,69	*3,40*
Valle d'Aosta	8,44	11,29	10,56	11,33	13,17	12,78	*7,16*
Lombardy	23,88	26,60	28,27	29,53	32,41	32,04	*5,02*
Trentino-Alto Adige	16,60	17,62	17,52	19,66	21,79	21,34	*4,28*
Veneto	20,15	22,84	23,15	24,70	27,03	27,08	*5,05*
Friuli-Venezia Giulia	22,66	25,20	24,52	25,06	28,86	31,07	*5,40*
Liguria	28,67	28,97	29,82	32,46	32,63	34,25	*3,01*
Emilia-Romagna	19,17	21,20	19,82	22,41	24,78	27,06	*5,91*
Tuscany	23,65	24,63	22,16	22,87	26,65	24,03	*0,27*
Umbria	22,86	23,75	24,66	26,77	30,73	33,68	*6,67*
Marche	20,24	20,10	21,54	24,39	28,01	27,05	*4,95*
Lazio	18,97	19,09	19,79	21,43	23,49	23,10	*3,34*
Abruzzo	18,02	17,88	21,01	22,21	22,65	25,18	*5,73*
Molise	13,71	15,53	16,62	17,72	21,77	22,19	*8,35*
Campania	12,12	12,81	12,97	14,52	16,52	17,61	*6,42*
Puglia	15,27	16,53	17,36	16,44	21,34	17,96	*2,74*
Basilicata	14,98	16,35	14,76	19,56	25,24	22,90	*7,33*
Calabria	10,28	8,46	12,34	11,27	14,42	13,15	*4,19*
Sicily	15,14	15,55	17,90	18,18	18,42	18,98	*3,83*
Sardinia	13,13	14,74	14,86	16,77	18,78	17,20	*4,60*
Italy	***17,38***	***18,51***	***19,32***	***20,39***	***22,98***	***22,60***	***4,47***
- North-West	*23,02*	*24,95*	*26,27*	*27,72*	*30,25*	*29,65*	*4,31*
- North-East	*19,49*	*21,62*	*21,14*	*23,10*	*25,53*	*26,61*	*5,33*
- Centre	*21,00*	*21,40*	*21,35*	*22,99*	*26,00*	*25,13*	*3,03*
- South & Islands	*13,72*	*14,21*	*15,66*	*16,10*	*18,66*	*17,87*	*4,51*

Source: INEA calculations using ISTAT figures, Conti economici territoriali, various years.

Tab. 7 - Profitability of land

Ratio of value added of agriculture, at basic prices, to UAA ('000 eurolira 1995)

Region	Year													R of I
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	1988-2000
Piemonte	1,53	1,60	1,63	1,53	1,61	1,67	1,66	1,73	1,80	1,71	1,69	1,79	1,82	*1,38*
Valle d'Aosta	0,28	0,30	0,29	0,31	0,32	0,31	0,37	0,34	0,46	0,43	0,43	0,46	0,55	*5,42*
Lombardy	2,12	2,22	2,32	2,43	2,73	2,79	2,80	2,77	3,09	3,12	3,10	3,16	3,42	*3,74*
Trentino-Alto Adige	1,38	1,18	1,39	1,34	1,55	1,50	1,70	1,44	1,67	1,55	1,62	1,76	1,71	*1,69*
Veneto	2,43	2,45	2,69	2,54	2,75	2,79	2,79	2,73	3,02	3,05	2,98	3,15	3,33	*2,44*
Friuli-Venezia Giulia	1,59	1,87	1,88	1,83	2,02	1,89	2,02	1,98	2,03	1,90	1,87	1,96	2,53	*3,62*
Liguria	4,47	5,29	5,66	5,25	6,28	8,26	8,57	7,86	7,01	7,28	7,06	7,00	10,45	*6,75*
Emilia-Romagna	2,34	2,30	2,49	2,11	2,56	2,33	2,34	2,24	2,31	2,08	2,29	2,41	2,89	*1,63*
Tuscany	1,24	1,28	1,30	1,30	1,24	1,23	1,31	1,35	1,30	1,24	1,24	1,26	1,35	*0,65*
Umbria	1,08	1,17	1,20	1,14	1,15	1,15	1,13	1,14	1,21	1,15	1,29	1,39	1,48	*2,50*
Marche	1,23	1,32	1,34	1,35	1,42	1,30	1,39	1,24	1,19	1,10	1,16	1,17	1,39	*0,94*
Lazio	1,64	1,71	1,61	1,67	1,71	1,75	1,82	1,83	1,74	1,70	1,78	1,88	2,11	*1,94*
Abruzzo	1,13	1,32	1,18	1,33	1,33	1,32	1,41	1,35	1,35	1,47	1,43	1,36	1,69	*3,13*
Molise	0,81	0,80	0,79	0,81	0,78	0,73	0,69	0,78	0,87	0,85	0,79	0,85	0,96	*1,32*
Campania	3,38	3,51	3,36	3,43	3,13	2,98	2,91	3,03	2,92	2,93	3,14	3,24	3,51	*0,30*
Puglia	1,74	1,60	1,36	2,06	1,91	1,83	2,10	1,87	1,88	1,88	1,75	2,19	2,26	*2,03*
Basilicata	0,51	0,42	0,37	0,60	0,54	0,65	0,73	0,69	0,70	0,61	0,80	0,97	0,90	*4,48*
Calabria	1,15	1,90	0,99	1,87	1,14	1,92	1,34	1,91	1,42	2,02	1,75	2,24	2,27	*5,33*
Sicily	1,43	1,45	1,32	1,82	1,72	1,80	1,62	1,53	1,53	1,71	1,63	1,57	2,10	*2,99*
Sardinia	0,47	0,39	0,42	0,54	0,55	0,61	0,67	0,56	0,65	0,69	0,67	0,69	0,86	*4,67*
Italy	***1,58***	***1,63***	***1,58***	***1,73***	***1,75***	***1,78***	***1,79***	***1,76***	***1,79***	***1,80***	***1,80***	***1,92***	***2,17***	***2,49***
- North-West	*1,87*	*1,98*	*2,05*	*2,03*	*2,25*	*2,35*	*2,36*	*2,37*	*2,54*	*2,50*	*2,49*	*2,57*	*2,76*	*3,04*
- North-East	*2,16*	*2,14*	*2,33*	*2,10*	*2,42*	*2,31*	*2,36*	*2,25*	*2,41*	*2,29*	*2,37*	*2,50*	*2,81*	*2,04*
- Centre	*1,34*	*1,40*	*1,39*	*1,40*	*1,41*	*1,39*	*1,45*	*1,43*	*1,39*	*1,33*	*1,38*	*1,44*	*1,60*	*1,40*
- South & Islands	*1,34*	*1,39*	*1,20*	*1,60*	*1,45*	*1,52*	*1,50*	*1,47*	*1,44*	*1,55*	*1,50*	*1,65*	*1,90*	*2,70*

Source: INEA calculations using ISTAT figures, Conti economici territoriali, various years; Censimento generale dell'agricoltura, 1993, 2003; Struttura e produzioni delle aziende agricole, various years.

Tab. 8 - Productivity of labour

Ratio of value of production of agriculture, hunting and forestry to work units in agriculture ('000 eurolira 1995)

Region	Year										
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Piemonte	16,34	16,82	18,08	17,35	16,61	17,94	18,11	19,30	18,98	21,11	21,13
Valle d'Aosta	9,17	8,95	9,39	9,54	8,65	9,03	8,29	9,36	9,19	9,55	9,65
Lombardy	29,34	28,58	30,28	29,88	30,57	33,23	32,21	33,96	35,09	37,39	38,96
Trentino-Alto Adige	12,44	11,36	15,58	12,61	12,92	14,20	15,59	16,11	16,52	17,01	19,01
Veneto	19,97	19,14	19,62	18,18	18,67	18,63	18,70	19,55	19,81	21,67	23,24
Friuli-Venezia Giulia	19,28	18,36	20,38	18,06	19,72	20,33	20,06	20,87	21,45	24,11	25,14
Liguria	11,05	10,21	12,31	11,52	15,94	13,06	11,89	12,91	13,60	15,90	15,77
Emilia-Romagna	21,26	22,90	25,02	24,38	24,48	24,05	25,44	27,06	28,04	29,87	32,75
Tuscany	12,86	12,88	13,61	13,53	12,52	11,94	13,45	14,16	13,60	14,70	14,59
Umbria	14,18	16,02	17,60	17,99	16,49	17,68	18,15	20,09	20,47	23,64	23,38
Marche	14,27	13,14	14,76	14,93	14,74	15,21	16,09	17,27	16,93	19,26	20,08
Lazio	14,91	15,79	15,54	16,57	15,08	15,47	14,96	16,20	16,70	17,82	16,82
Abruzzo	11,16	13,83	13,33	13,21	12,44	12,89	12,98	13,86	12,96	14,48	13,80
Molise	7,64	9,27	9,21	9,96	11,56	12,52	12,68	11,93	13,14	14,91	14,14
Campania	7,86	9,24	9,04	9,38	9,02	9,32	9,80	10,08	10,71	11,51	10,65
Puglia	12,93	12,48	12,15	15,58	14,98	16,13	16,45	18,32	21,00	19,28	16,78
Basilicata	8,97	9,39	8,64	7,89	9,45	9,58	11,65	11,06	10,90	9,87	9,25
Calabria	8,60	9,07	8,05	10,38	7,12	10,18	7,81	10,02	7,41	9,72	6,45
Sicily	12,55	12,74	12,54	14,77	14,33	15,47	14,98	15,03	14,73	15,48	14,13
Sardinia	14,80	14,62	15,08	15,40	14,50	15,83	15,44	15,36	16,31	14,32	13,98
Italy	***14,43***	***14,88***	***15,40***	***15,84***	***15,50***	***16,11***	***16,29***	***17,17***	***17,36***	***18,43***	***18,10***
- North-West	*20,64*	*20,58*	*22,08*	*21,53*	*21,93*	*23,14*	*22,75*	*24,16*	*24,45*	*26,73*	*27,32*
- North-East	*19,67*	*19,74*	*21,41*	*20,00*	*20,37*	*20,34*	*21,05*	*22,14*	*22,70*	*24,46*	*26,49*
- Centre	*13,97*	*14,23*	*14,91*	*15,29*	*14,24*	*14,37*	*14,94*	*16,04*	*16,00*	*17,55*	*17,27*
- South & Islands	*10,63*	*11,24*	*10,88*	*12,35*	*11,60*	*12,68*	*12,56*	*13,14*	*13,26*	*13,67*	*12,19*

Source: INEA calculations using ISTAT figures, Conti economici territoriali, various years.

(continued)

Tab. 8 - Productivity of labour (*continued*)

Ratio of value of production of agriculture, hunting and forestry to work units in agriculture ('000 eurolira 1995)

Region	Year											R of I
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	1980-2001
Piemonte	19,95	22,01	24,15	25,04	35,87	37,27	37,88	40,49	43,85	42,45	43,60	*4,56*
Valle d'Aosta	9,22	10,13	10,15	11,53	16,35	18,94	18,03	19,41	22,29	20,86	21,60	*3,97*
Lombardy	38,93	44,17	45,15	46,42	42,81	44,39	46,66	48,20	52,27	51,20	52,96	*2,72*
Trentino-Alto Adige	18,60	21,71	22,67	26,10	23,71	24,06	24,43	26,76	29,42	29,30	30,64	*4,18*
Veneto	21,85	24,09	26,17	27,07	31,98	35,23	35,48	37,85	40,37	41,19	43,20	*3,57*
Friuli-Venezia Giulia	24,28	27,14	28,59	30,56	32,30	34,99	35,38	36,70	40,97	44,77	44,67	*3,89*
Liguria	14,25	18,30	22,59	23,73	33,79	35,96	36,05	39,10	38,00	40,26	37,11	*5,66*
Emilia-Romagna	30,40	35,61	35,84	37,01	31,17	34,33	33,50	36,56	39,35	42,37	42,83	*3,23*
Tuscany	15,01	16,17	16,74	17,78	32,63	34,90	32,20	32,79	37,87	34,27	31,99	*4,23*
Umbria	23,69	24,89	26,71	27,43	35,86	36,71	38,37	40,00	44,50	48,83	45,58	*5,45*
Marche	19,65	21,03	21,25	22,86	32,51	33,33	35,46	39,00	42,33	43,10	43,00	*5,14*
Lazio	18,22	18,70	19,38	20,50	28,45	28,33	29,06	31,34	33,57	33,33	29,71	*3,18*
Abruzzo	15,18	15,77	15,77	16,44	25,62	25,87	29,17	30,38	30,73	34,35	31,94	*4,90*
Molise	15,10	15,30	14,50	14,50	24,68	27,07	28,12	29,76	34,92	35,92	38,17	*7,59*
Campania	11,03	10,69	11,18	11,08	16,78	17,80	17,74	19,12	21,52	23,04	22,50	*4,90*
Puglia	24,93	23,13	24,63	28,66	20,32	21,58	22,50	21,55	26,12	23,10	21,45	*2,33*
Basilicata	13,84	12,92	14,24	15,56	23,02	24,72	23,35	28,08	34,16	32,60	30,63	*5,74*
Calabria	9,69	7,06	10,21	8,68	13,73	12,55	15,92	14,83	18,13	17,11	17,59	*3,30*
Sicily	17,64	16,51	17,57	17,27	19,75	20,35	22,08	22,52	22,22	23,09	22,02	*2,59*
Sardinia	16,38	18,24	20,68	21,75	20,38	21,54	21,39	25,22	27,68	26,53	27,11	*2,79*
Italy	***19,28***	***20,17***	***21,43***	***22,29***	***26,17***	***27,60***	***28,41***	***29,80***	***32,61***	***32,58***	***32,15***	***3,71***
- North-West	*26,54*	*30,14*	*32,16*	*33,26*	*38,93*	*40,59*	*42,03*	*44,16*	*47,40*	*46,54*	*47,57*	*3,87*
- North-East	*24,84*	*28,34*	*29,55*	*30,95*	*30,70*	*33,38*	*33,27*	*35,83*	*38,63*	*40,49*	*41,59*	*3,46*
- Centre	*17,86*	*18,88*	*19,51*	*20,63*	*31,26*	*32,15*	*32,24*	*34,18*	*37,65*	*36,88*	*34,16*	*4,15*
- South & Islands	*15,25*	*14,45*	*15,68*	*16,15*	*18,90*	*19,62*	*20,83*	*21,43*	*23,92*	*23,49*	*22,69*	*3,51*

Source: INEA calculations using ISTAT figures, Conti economici territoriali, various years.

Tab. 9 - Productivity of land

Ratio of value of agricultural production to UAA ('000 eurolira 1995)

Region	Year			R of I
	1982	1990	2000	1982-2000
Piemonte	2,80	2,92	3,03	*0,43*
Valle d'Aosta	0,64	0,60	0,89	*1,80*
Lombardy	4,20	4,76	5,51	*1,44*
Trentino-Alto Adige	2,01	2,04	2,39	*0,91*
Veneto	4,52	4,65	5,14	*0,68*
Friuli-Venezia Giulia	3,01	3,19	3,90	*1,37*
Liguria	5,02	6,77	12,55	*4,94*
Emilia-Romagna	4,15	4,19	4,56	*0,50*
Tuscany	2,11	1,96	2,00	*-0,28*
Umbria	1,90	1,97	2,19	*0,75*
Marche	2,18	2,24	2,30	*0,28*
Lazio	2,73	2,61	3,10	*0,66*
Abruzzo	1,97	1,93	2,41	*1,07*
Molise	1,22	1,47	1,60	*1,43*
Campania	4,23	4,56	4,65	*0,50*
Puglia	1,86	1,90	2,89	*2,36*
Basilicata	0,82	0,72	1,28	*2,35*
Calabria	1,81	1,57	2,99	*2,68*
Sicily	1,82	1,84	2,72	*2,14*
Sardinia	0,78	0,77	1,36	*2,98*
Italy	***2,51***	***2,58***	***3,19***	***1,27***
- North-West	*3,44*	*3,82*	*4,38*	*1,27*
- North-East	*3,85*	*3,92*	*4,35*	*0,63*
- Centre	*2,28*	*2,22*	*2,41*	*0,29*
- South & Islands	*1,76*	*1,77*	*2,55*	*1,96*

Source: INEA calculations using ISTAT figures, Conti economici territoriali, various years.

Tab. 10 - Marginalisation

Percentage share of farms with <5ha UAA and <4 ESU in total farms

Region	Year				Variation
	1995	1997	1998	1999	1995/2000
Piemonte	55,70	48,47	55,81	42,98	-22,84
Valle d'Aosta	64,66	72,45	75,55	71,26	10,22
Lombardy	57,09	51,26	58,65	51,58	-9,65
Trentino-Alto Adige	49,50	39,18	40,69	29,91	-39,57
Veneto	66,38	61,12	71,13	58,53	-11,83
Friuli-Venezia Giulia	68,50	64,88	71,30	61,48	-10,24
Liguria	50,44	45,17	42,13	37,03	-26,58
Emilia-Romagna	44,04	37,33	41,33	33,54	-23,85
Tuscany	60,52	53,74	55,84	45,87	-24,21
Umbria	70,37	63,95	70,49	67,29	-4,37
Marche	59,12	53,35	59,23	51,50	-12,89
Lazio	77,39	74,70	77,74	73,34	-5,23
Abruzzo	65,32	70,23	74,28	65,59	0,42
Molise	68,69	65,59	67,50	59,30	-13,66
Campania	69,45	66,39	75,20	68,86	-0,85
Puglia	65,47	68,86	75,01	66,64	1,78
Basilicata	61,86	60,98	60,13	58,80	-4,96
Calabria	79,44	68,79	76,51	68,30	-14,02
Sicily	65,71	66,09	71,48	64,66	-1,60
Sardinia	60,68	50,64	50,45	47,07	-22,42
Italy	***64,59***	***61,49***	***66,96***	***59,20***	***-8,34***
- North-West	*55,74*	*49,75*	*55,61*	*46,07*	*-17,34*
- North-East	*57,67*	*51,78*	*58,31*	*47,62*	*-17,42*
- Centre	*68,86*	*64,51*	*68,33*	*62,06*	*-9,87*
- South & Islands	*67,53*	*66,11*	*71,63*	*64,66*	*-4,26*

Source: INEA calculations using ISTAT figures, Struttura e produzioni delle aziende agricole, various years.

Tab. 11 - Diversification in farm holders' activities

Percentage breakdown of farms, by amount of time farm holder works on farm

Region	Year														
	1993			1995			1996			1997			1999		
	Exclusively on the farm	Mainly on the farm	Mainly off the farm	Exclusively on the farm	Mainly on the farm	Mainly off the farm	Exclusively on the farm	Mainly on the farm	Mainly off the farm	Exclusively on the farm	Mainly on the farm	Mainly off the farm	Exclusively on the farm	Mainly on the farm	Mainly off the farm
Piemonte	82,28	1,26	16,45	84,97	0,88	14,14	80,90	2,19	16,91	84,44	2,54	13,02	80,82	6,36	12,83
Valle d'Aosta	76,76	3,77	19,47	83,95	0,35	15,70	95,30	2,17	2,54	82,14	2,35	15,51	80,82	4,30	14,88
Lombardy	79,81	2,65	17,54	82,74	1,50	15,76	82,43	3,06	14,51	84,92	2,66	12,42	42,44	44,45	13,11
Trentino-Alto Adige	62,95	6,34	30,71	61,03	7,34	31,63	71,65	5,00	23,35	68,22	7,00	24,78	68,63	7,26	24,11
Veneto	72,78	1,59	25,63	72,95	1,68	25,38	77,70	1,22	21,08	76,77	1,91	21,32	73,70	2,48	23,82
Friuli-Venezia Giulia	82,66	0,48	16,87	80,36	0,51	19,13	85,64	0,75	13,61	83,46	1,76	14,77	78,93	1,62	19,45
Liguria	86,30	1,07	12,63	92,65	0,66	6,68	92,59	2,14	5,27	90,08	1,75	8,17	75,94	8,82	15,23
Emilia-Romagna	77,09	2,89	20,02	83,19	2,39	14,41	81,00	2,07	16,93	82,37	2,21	15,42	79,97	3,47	16,56
Tuscany	71,04	1,21	27,75	72,21	2,20	25,59	84,69	1,53	13,77	76,90	3,90	19,19	78,16	3,36	18,48
Umbria	73,37	1,50	25,13	79,65	0,60	19,75	82,05	3,01	14,94	77,03	0,62	22,35	65,33	2,82	31,85
Marche	75,04	2,37	22,59	74,85	1,66	23,49	75,08	3,46	21,46	74,14	2,36	23,50	75,48	3,34	21,18
Lazio	69,53	1,18	29,29	68,63	1,36	30,01	75,50	1,70	22,79	75,48	1,31	23,21	73,32	1,68	25,00
Abruzzo	72,60	3,75	23,66	73,72	1,70	24,57	80,28	0,20	19,52	75,24	3,25	21,50	72,32	2,77	24,91
Molise	85,05	2,91	12,04	82,34	0,39	17,27	81,83	0,87	17,30	81,18	1,34	17,49	74,89	4,50	20,61
Campania	65,67	16,76	17,57	83,06	1,37	15,58	85,91	0,89	13,20	78,17	1,95	19,89	72,31	2,89	24,81
Puglia	65,03	2,87	32,10	68,03	1,09	30,88	67,03	1,89	31,09	70,30	2,08	27,62	66,98	4,36	28,66
Basilicata	71,48	0,93	27,59	77,55	0,74	21,71	71,04	2,26	26,70	78,38	1,96	19,66	70,14	2,86	27,00
Calabria	67,67	3,86	28,47	68,53	2,72	28,74	65,21	4,45	30,34	67,54	2,62	29,83	67,82	2,73	29,45
Sicily	82,76	2,06	15,18	72,39	1,39	26,22	70,20	2,06	27,74	75,23	1,77	23,00	70,67	2,64	26,69
Sardinia	77,33	1,09	21,58	71,90	1,46	26,64	80,08	1,73	18,19	76,43	1,87	21,70	75,63	2,60	21,77
Italy	***73,56***	***3,59***	***22,84***	***74,97***	***1,58***	***23,45***	***76,40***	***2,02***	***21,58***	***76,32***	***2,21***	***21,47***	***71,34***	***5,01***	***23,65***
- North-West	*81,81*	*1,77*	*16,42*	*85,14*	*1,05*	*13,81*	*83,23*	*2,48*	*14,29*	*85,31*	*2,48*	*12,22*	*69,99*	*15,75*	*14,26*
- North-East	*74,19*	*2,40*	*23,41*	*75,69*	*2,39*	*21,92*	*78,90*	*1,87*	*19,23*	*78,27*	*2,57*	*19,15*	*75,64*	*3,26*	*21,10*
- Centre	*71,34*	*1,43*	*27,23*	*71,98*	*1,55*	*26,47*	*78,70*	*2,11*	*19,19*	*75,75*	*2,04*	*22,21*	*73,93*	*2,52*	*23,56*
- South & Islands	*72,21*	*5,04*	*22,75*	*73,38*	*1,45*	*25,17*	*73,38*	*1,94*	*24,68*	*74,02*	*2,09*	*23,89*	*70,29*	*3,16*	*26,56*

Source: ISTAT, Struttura e produzioni delle aziende agricole, various years.

Tab. 12 - Share of agricultural value added in total value added

Percentage share of value added of agriculture, forestry and fishing in total value added (at basic prices)

Region	Year							R of I
	1995	1996	1997	1998	1999	2000	2001	1995-2001
Piemonte	2,63	2,55	2,47	2,33	2,28	2,03	2,02	*-3,70*
Valle D'Aosta	1,33	1,47	1,36	1,33	1,32	1,40	1,36	*0,29*
Lombardy	1,75	1,79	1,80	1,66	1,59	1,59	1,61	*-1,15*
Trentino-Alto Adige	3,69	4,10	3,84	3,46	3,62	3,11	3,29	*-1,64*
Veneto	3,31	3,47	3,32	3,23	3,15	2,89	2,85	*-2,09*
Friuli-Venezia Giulia	3,07	3,10	2,84	2,72	2,67	2,51	2,54	*-2,69*
Liguria	2,80	2,52	2,35	2,37	2,25	2,13	2,04	*-4,46*
Emilia-Romagna	3,83	3,84	3,44	3,48	3,46	3,54	3,49	*-1,29*
Tuscany	2,37	2,28	2,15	2,14	2,04	1,80	1,75	*-4,26*
Umbria	4,01	4,38	3,62	3,40	3,41	3,22	3,01	*-3,98*
Marche	3,89	3,52	3,59	3,38	3,14	2,73	2,57	*-5,78*
Lazio	1,75	1,63	1,63	1,59	1,59	1,58	1,52	*-2,00*
Abruzzo	4,36	4,38	4,56	4,66	4,34	4,03	3,80	*-1,94*
Molise	5,16	5,80	5,42	4,69	4,75	4,24	4,22	*-2,83*
Campania	3,64	3,52	3,29	3,54	3,45	3,27	3,32	*-1,32*
Puglia	7,36	7,59	6,97	6,68	6,88	5,83	5,35	*-4,46*
Basilicata	6,49	6,56	5,57	6,90	7,29	5,93	5,81	*-1,55*
Calabria	6,85	5,81	6,86	5,63	6,44	5,66	5,52	*-3,04*
Sicily	5,45	5,27	5,58	5,13	4,78	4,72	4,49	*-2,72*
Sardinia	4,61	4,92	5,04	4,98	4,60	4,20	4,41	*-0,64*
Italy	***3,24***	***3,22***	***3,12***	***3,01***	***2,96***	***2,76***	***2,71***	***-2,50***
- North-West	*2,08*	*2,06*	*2,03*	*1,90*	*1,83*	*1,75*	*1,76*	-2,35
- North-East	*3,52*	*3,64*	*3,37*	*3,30*	*3,27*	*3,13*	*3,11*	-1,75
- Centre	*2,36*	*2,25*	*2,17*	*2,10*	*2,05*	*1,91*	*1,82*	-3,62
- South & Islands	*5,33*	*5,26*	*5,22*	*5,04*	*5,01*	*4,57*	*4,41*	-2,66

Source: INEA calculations using ISTAT figures, Conti economici territoriali, various years.

Tab. 13a - Fixed investments in agriculture

Expenditures for gross fixed investments in agriculture (million eurolira 1995)

Region	Year							R of I
	1995	1996	1997	1998	1999	2000	2001	1995-2001
Piemonte	945,12	883,81	893,63	802,99	926,68	931,07	915,11	*-0,46*
Valle d'Aosta	23,81	19,73	24,53	20,76	24,33	17,82	14,41	*-6,92*
Lombardy	941,81	1.002,65	930,29	944,75	1.102,43	1.428,42	1.430,59	*6,15*
Trentino-Alto Adige	251,41	265,67	263,55	327,85	358,11	362,24	322,63	*3,63*
Veneto	744,27	854,22	944,13	842,60	887,07	1.006,42	857,37	*2,04*
Friuli-Venezia Giulia	158,66	171,67	173,63	172,14	196,82	212,78	209,32	*4,04*
Liguria	79,59	84,29	80,05	70,34	80,41	85,06	67,35	*-2,36*
Emilia-Romagna	843,89	877,51	916,71	1.173,70	1.375,12	1.037,98	1.092,82	*3,76*
Tuscany	328,11	357,23	338,74	425,35	417,50	383,57	370,45	*1,75*
Umbria	172,86	190,52	168,47	133,81	137,84	132,63	136,86	*-3,28*
Marche	253,27	274,08	293,50	342,57	433,36	402,06	348,92	*4,68*
Lazio	357,39	381,66	348,71	321,24	292,26	403,97	350,05	*-0,30*
Abruzzo	193,77	232,56	234,99	186,03	192,69	222,54	161,24	*-2,59*
Molise	77,26	78,50	71,68	74,27	65,69	79,95	83,15	*1,05*
Campania	459,03	512,48	413,37	529,32	507,11	493,22	508,45	*1,47*
Puglia	597,49	639,68	608,13	732,54	772,52	957,15	1.086,68	*8,92*
Basilicata	187,94	230,18	209,89	198,68	210,97	261,74	262,46	*4,89*
Calabria	164,80	238,19	211,59	193,21	214,23	211,70	179,00	*1,19*
Sicily	655,18	518,42	512,79	574,20	414,30	537,32	549,56	*-2,48*
Sardinia	331,36	501,38	530,19	415,28	350,00	334,97	248,78	*-4,01*
Italy	***7.767,00***	***8.314,44***	***8.168,59***	***8.481,62***	***8.959,44***	***9.502,60***	***9.195,21***	***2,44***
- North-West	1.990,32	1.990,48	1.928,50	1.838,84	2.133,84	*2.462,36*	*2.427,45*	*2,88*
- North-East	1.998,22	2.169,07	2.298,03	2.516,28	2.817,12	*2.619,42*	*2.482,14*	*3,15*
- Centre	1.111,62	1.203,50	1.149,43	1.222,97	1.280,97	*1.322,23*	*1.206,29*	*1,17*
- South & Islands	2.666,83	2.951,40	2.792,64	2.903,52	2.727,51	*3.098,59*	*3.079,32*	*2,08*

Source: ISTAT, Conti economici territoriali, various years.

Tab. 13b - Share of gross fixed investments in agricultural value added

Ratio of gross fixed investments in agriculture to value added from agriculture, forestry and fishing (figures at 1995 prices)

Regioni	Year							R of I
	1995	1996	1997	1998	1999	2000	2001	1995-2001
Piemonte	0,47	0,43	0,43	0,40	0,44	0,47	0,45	*-0,55*
Valle d'Aosta	0,74	0,47	0,64	0,53	0,61	0,44	0,36	*-9,59*
Lombardy	0,30	0,29	0,26	0,26	0,30	0,39	0,39	*3,69*
Trentino-Alto Adige	0,37	0,34	0,36	0,42	0,43	0,46	0,39	*0,57*
Veneto	0,28	0,30	0,33	0,29	0,29	0,34	0,28	*-0,19*
Friuli-Venezia Giulia	0,25	0,26	0,27	0,26	0,28	0,31	0,29	*1,94*
Liguria	0,11	0,12	0,12	0,10	0,11	0,12	0,10	*-1,38*
Emilia-Romagna	0,29	0,29	0,34	0,39	0,43	0,31	0,32	*1,30*
Tuscany	0,24	0,27	0,28	0,34	0,32	0,31	0,30	*3,49*
Umbria	0,35	0,36	0,33	0,26	0,25	0,23	0,26	*-4,41*
Marche	0,30	0,34	0,35	0,40	0,50	0,50	0,44	*5,59*
Lazio	0,23	0,26	0,23	0,21	0,18	0,25	0,23	*0,04*
Abruzzo	0,27	0,32	0,30	0,23	0,25	0,30	0,22	*-3,06*
Molise	0,40	0,36	0,32	0,35	0,28	0,36	0,37	*-0,87*
Campania	0,23	0,26	0,21	0,25	0,23	0,23	0,23	*0,37*
Puglia	0,20	0,22	0,21	0,26	0,23	0,32	0,40	*10,04*
Basilicata	0,46	0,53	0,57	0,39	0,34	0,54	0,60	*3,80*
Calabria	0,13	0,25	0,16	0,17	0,15	0,16	0,13	*-0,33*
Sicily	0,24	0,19	0,18	0,21	0,16	0,19	0,21	*-1,93*
Sardinia	0,39	0,53	0,55	0,41	0,35	0,36	0,25	*-6,20*
Italy	***0,28***	***0,29***	***0,28***	***0,29***	***0,29***	***0,32***	***0,31***	***1,54***
- North-West	*0,34*	*0,32*	*0,30*	*0,29*	*0,33*	*0,39*	*0,38*	*1,62*
- North-East	*0,29*	*0,30*	*0,33*	*0,34*	*0,36*	*0,33*	*0,31*	*0,75*
- Centre	*0,26*	*0,29*	*0,28*	*0,29*	*0,29*	*0,31*	*0,30*	*1,86*
- South & Islands	*0,24*	*0,27*	*0,24*	*0,25*	*0,22*	*0,27*	*0,27*	*1,78*

Source: INEA calculations using ISTAT figures, Conti economici territoriali, various years.

Tab. 14 - Herd density

Ratio of Livestock Units to UAA

Region	Year				R of I
	1970	1982	1990	2000	1970-2000
Piemonte	0,73	0,78	1,17	1,14	*1,45*
Valle D'Aosta	0,20	0,20	0,43	0,56	*3,44*
Lombardy	1,31	1,86	2,69	2,87	*2,55*
Trentino-Alto Adige	0,20	0,21	0,56	0,53	*3,16*
Veneto	1,03	1,42	1,95	1,75	*1,72*
Friuli-Venezia Giulia	0,50	0,55	1,01	0,93	*2,05*
Liguria	0,13	0,11	0,35	0,37	*3,28*
Emilia-Romagna	0,92	1,04	1,33	1,18	*0,78*
Tuscany	0,29	0,23	0,39	0,29	*0,00*
Umbria	0,49	0,43	0,70	0,59	*0,59*
Marche	0,68	0,43	0,52	0,39	*-1,78*
Lazio	0,36	0,40	0,64	0,56	*1,41*
Abruzzo	0,34	0,33	0,46	0,41	*0,64*
Molise	0,28	0,33	0,52	0,53	*2,07*
Campania	0,45	0,44	0,65	0,76	*1,69*
Puglia	0,15	0,15	0,16	0,17	*0,42*
Basilicata	0,21	0,21	0,27	0,28	*1,01*
Calabria	0,22	0,20	0,38	0,33	*1,33*
Sicily	0,22	0,28	0,42	0,33	*1,33*
Sardinia	0,28	0,31	0,54	0,61	*2,55*
Italy	***0,49***	***0,56***	***0,84***	***0,82***	***1,67***
- North-West	*0,88*	*1,13*	*1,81*	*1,90*	*2,50*
- North-East	*0,74*	*0,90*	*1,38*	*1,24*	*1,66*
- Centre	*0,42*	*0,35*	*0,54*	*0,43*	*0,09*
- South & Islands	*0,28*	*0,29*	*0,40*	*0,40*	*1,18*

Source: INEA calculations using ISTAT figures, Censimento generale dell'agricoltura, various years.

Tab. 15 - Livestock

Percentage breakdown of livestock by type of breed

Region	Year									
	1970					1982				
	Cattle and buffalo	Horses	Pigs	Sheep-goats	Poultry	Cattle and buffalo	Horses	Pigs	Sheep-goats	Poultry
Piemonte	85,47	0,73	7,79	0,81	5,21	78,53	0,33	13,74	1,24	6,18
Valle D'Aosta	94,68	1,49	1,10	1,65	1,08	95,66	0,51	1,11	1,97	0,75
Lombardy	76,68	1,00	15,14	0,32	6,87	65,92	0,28	26,12	0,39	7,29
Trentino-Alto Adige	83,69	1,96	8,17	1,92	4,26	86,95	0,90	6,23	2,19	3,74
Veneto	79,38	0,88	7,36	0,20	12,19	74,20	0,33	10,27	0,24	14,96
Friuli-Venezia Giulia	81,04	2,14	8,87	0,29	7,66	67,65	1,33	16,43	0,44	14,15
Liguria	74,70	4,36	5,00	5,26	10,68	68,86	3,69	5,99	8,82	12,64
Emilia-Romagna	65,23	0,42	25,65	0,66	8,04	56,96	0,33	36,44	0,68	5,57
Tuscany	55,59	1,56	27,21	8,65	6,99	46,54	2,61	29,34	14,14	7,37
Umbria	56,91	1,23	33,12	4,17	4,57	42,65	1,66	42,37	6,35	6,98
Marche	72,38	0,41	18,74	2,75	5,73	52,84	0,98	27,45	5,58	13,15
Lazio	67,75	6,17	9,96	10,75	5,36	64,48	4,39	12,13	14,17	4,83
Abruzzo	64,32	5,21	11,70	13,31	5,46	55,30	3,59	15,33	19,06	6,72
Molise	54,76	13,63	13,75	13,16	4,71	51,78	5,36	15,66	12,65	14,54
Campania	69,38	7,51	12,06	5,97	5,07	68,72	2,17	13,60	6,87	8,64
Puglia	62,92	9,73	3,95	19,33	4,06	68,60	2,65	5,64	18,76	4,36
Basilicata	42,80	11,28	16,04	27,46	2,42	54,31	3,74	15,34	24,37	2,24
Calabria	60,37	8,12	15,41	12,38	3,73	60,45	4,22	16,33	12,57	6,43
Sicily	66,75	13,58	4,79	11,52	3,36	75,54	3,25	6,14	11,15	3,92
Sardinia	44,94	3,22	10,21	39,56	2,07	45,25	2,21	10,23	40,90	1,41
Italy	***70,73***	***2,73***	***14,38***	***5,61***	***6,55***	***65,17***	***1,19***	***20,15***	***5,82***	***7,68***
- North-West	*80,00*	*0,95*	*12,04*	*0,79*	*6,23*	*70,25*	*0,33*	*21,83*	*0,66*	*6,93*
- North-East	*73,13*	*0,83*	*16,03*	*0,60*	*9,42*	*66,93*	*0,43*	*21,93*	*0,52*	*10,19*
- Centre	*63,71*	*2,34*	*21,45*	*6,71*	*5,79*	*53,04*	*2,67*	*25,74*	*10,85*	*7,71*
- South & Islands	*54,81*	*7,53*	*9,54*	*24,66*	*3,46*	*57,03*	*2,82*	*10,47*	*24,96*	*4,72*

(continued)

Source: ISTAT, Censimento generale dell'agricoltura, various years.

Tab. 15 - Livestock (*continued*)

Percentage breakdown of livestock by type of breed

Region	Year									
	1990					2000				
	Cattle and buffalo	Horses	Pigs	Sheep-goats	Poultry	Cattle and buffalo	Horses	Pigs	Sheep-goats	Poultry
Piemonte	74,60	0,48	16,79	1,05	7,08	67,44	0,58	22,83	1,11	8,05
Valle D'Aosta	97,02	0,34	0,37	1,76	0,50	97,15	0,39	0,80	1,40	0,25
Lombardy	64,69	0,45	28,17	0,42	6,27	54,19	0,41	38,49	0,48	6,43
Trentino-Alto Adige	87,39	1,24	4,06	2,61	4,71	86,97	1,86	3,05	3,75	4,38
Veneto	68,54	0,55	10,28	0,25	20,39	62,54	0,53	14,11	0,29	22,52
Friuli-Venezia Giulia	57,61	0,55	23,78	0,47	17,59	45,66	0,62	25,91	0,56	27,25
Liguria	68,47	4,91	3,12	11,85	11,65	71,80	6,75	1,93	11,06	8,45
Emilia-Romagna	53,03	0,61	34,60	0,64	11,12	47,53	0,72	35,56	0,68	15,52
Tuscany	41,36	3,81	24,06	20,65	10,12	41,79	4,50	20,78	23,08	9,84
Umbria	34,92	2,39	38,05	7,81	16,84	29,22	2,29	34,79	7,23	26,48
Marche	41,41	1,30	26,17	8,25	22,87	40,01	1,54	22,50	8,61	27,34
Lazio	63,89	3,42	10,10	17,47	5,11	67,53	3,38	6,62	16,71	5,75
Abruzzo	48,53	2,66	16,75	20,14	11,92	46,73	2,85	19,46	16,74	14,21
Molise	51,41	1,64	13,44	11,72	21,78	50,34	1,31	12,55	10,89	24,91
Campania	73,97	0,95	11,43	7,15	6,50	75,13	0,65	9,32	6,06	8,84
Puglia	70,49	2,86	4,55	18,18	3,92	74,72	2,14	3,84	12,75	6,55
Basilicata	51,66	2,62	13,34	29,63	2,76	51,15	2,00	16,26	28,32	2,27
Calabria	56,08	1,25	16,74	21,85	4,06	56,08	1,20	16,65	20,66	5,42
Sicily	69,88	1,17	4,05	22,32	2,58	73,30	1,21	2,97	19,73	2,79
Sardinia	39,60	1,46	10,70	46,44	1,79	39,85	1,57	9,26	48,04	1,27
Italy	***61,69***	***1,06***	***19,88***	***7,91***	***9,47***	***57,16***	***1,02***	***23,72***	***7,10***	***11,01***
- North-West	*67,99*	*0,49*	*24,31*	*0,71*	*6,50*	*58,48*	*0,49*	*33,45*	*0,72*	*6,85*
- North-East	*62,32*	*0,61*	*21,21*	*0,57*	*15,28*	*56,96*	*0,70*	*22,84*	*0,70*	*18,80*
- Centre	*48,40*	*2,91*	*22,02*	*14,62*	*12,05*	*48,68*	*3,08*	*18,57*	*14,77*	*14,90*
- South & Islands	*57,89*	*1,59*	*10,08*	*25,56*	*4,88*	*58,91*	*1,46*	*9,62*	*24,01*	*6,01*

Source: ISTAT, Censimento generale dell'agricoltura, various years.

Tab. 16 - Phosphorus balance

Ratio of the difference between inputs and uptakes of phosphorus to UAA (kg/ha of UAA)

Region	Year												Variation
	1994				1998				2000				1994/2000
	Mineral fertilisers	Organic fertilisers	Uptakes	Surplus	Mineral fertilisers	Organic fertilisers	Uptakes	Surplus	Mineral fertilisers	Organic fertilisers	Uptakes	Surplus	Surplus
Piemonte	35,00	33,00	39,00	29,00	26,20	41,20	35,60	31,80	19,33	36,04	28,53	26,85	*-7,42*
Valle d'Aosta	1,00	15,00	3,00	13,00	0,20	13,60	3,70	10,10	0,19	16,83	6,74	10,29	*-20,87*
Liguria	42,00	25,00	45,00	22,00	13,90	13,00	18,80	8,10	8,20	14,22	9,70	12,73	*-42,15*
Lombardy	41,00	92,00	45,00	88,00	40,00	74,90	47,20	67,70	34,69	81,06	47,18	68,58	*-22,07*
Trentino-Alto Adige	19,00	22,00	21,00	20,00	7,10	18,60	16,00	9,70	6,01	22,50	13,43	15,08	*-24,59*
Veneto	60,00	63,00	65,00	58,00	66,50	48,80	77,00	38,30	58,86	51,51	48,58	61,79	*6,53*
Friuli-Venezia Giulia	42,00	31,00	47,00	26,00	47,70	19,00	66,00	0,70	47,02	20,33	44,96	22,39	*-13,89*
Emilia-Romagna	48,00	40,50	51,50	36,00	42,70	30,10	37,90	34,90	35,39	40,11	39,34	36,16	*0,44*
Tuscany	26,00	14,00	30,00	10,00	38,30	11,20	24,00	25,50	27,89	12,67	17,75	22,99	*129,89*
Umbria	29,00	17,00	34,00	12,00	50,30	17,10	39,40	28,00	42,39	16,44	25,15	33,67	*180,62*
Marche	31,00	15,00	35,00	11,00	49,90	9,10	40,90	18,10	47,01	11,19	25,15	30,19	*174,44*
Lazio	25,00	20,00	29,00	16,00	30,70	23,20	27,00	26,90	20,04	20,14	21,03	27,14	*69,63*
Abruzzo	25,00	16,50	27,50	12,00	30,80	15,60	23,90	22,50	26,74	15,51	17,06	24,19	*101,58*
Molise	17,00	16,00	21,00	12,00	28,30	17,60	19,80	26,10	18,91	12,46	17,48	13,89	*15,76*
Campania	35,00	23,00	40,00	19,00	37,60	26,60	37,20	27,00	30,81	19,77	21,42	29,17	*53,51*
Puglia	43,00	8,00	47,00	4,00	27,10	6,70	22,90	10,90	21,80	6,46	16,98	11,27	*181,68*
Basilicata	23,00	11,00	28,00	6,00	19,10	16,60	35,50	0,20	17,24	12,61	13,62	16,23	*170,47*
Calabria	42,00	11,00	45,00	8,00	19,40	19,20	28,00	10,60	12,78	11,53	16,03	8,28	*3,48*
Sicily	34,00	12,00	38,00	8,00	23,90	18,10	32,20	9,80	24,10	12,11	11,38	24,83	*210,41*
Sardinia	11,00	17,00	14,00	14,00	12,20	25,60	19,60	18,20	10,64	15,78	5,88	20,55	*46,78*
Italy	***33,61***	***27,10***	***37,50***	***23,11***	***31,54***	***26,26***	***33,73***	***24,07***	***26,50***	***25,06***	***23,40***	***28,49***	***23,29***
- North-West	*36,61*	*58,81*	*40,49*	*54,92*	*31,09*	*54,63*	*39,09*	*46,62*	*25,13*	*54,74*	*35,46*	*44,41*	*-19,14*
- North-East	*47,07*	*44,18*	*51,00*	*39,83*	*45,75*	*33,26*	*50,17*	*28,84*	*39,68*	*38,96*	*39,09*	*39,55*	*-0,69*
- Centre	*27,22*	*16,60*	*31,38*	*12,44*	*40,16*	*15,22*	*30,71*	*24,66*	*31,52*	*15,38*	*21,52*	*27,48*	*120,83*
- South & Islands	*29,72*	*13,60*	*33,49*	*9,78*	*23,09*	*18,05*	*26,74*	*14,40*	*19,78*	*12,67*	*13,59*	*18,78*	*92,05*

Source: ELBA model (Environmental Liveliness and Blent Agriculture), University of Bologna.

Tab. 17a - Plant protection products distributed for agricultural use, classified by toxicity

Ratio of quantity of plant protection products distributed for agricultural use to "treatable" area (kg/ha of treatable area)

Region	Year							
	1997				1998			
	Highly toxic or toxic	Noxious	Not classifiable	Total	Highly toxic or toxic	Noxious	Not classifiable	Total
Piemonte	0,41	3,21	21,65	25,27	0,32	2,38	21,05	23,75
Valle d'Aosta	0,00	0,00	0,00	0,00	0,09	0,64	10,31	11,05
Lombardy	0,34	2,68	11,95	14,97	0,29	2,32	11,21	13,81
Trentino-Alto Adige	3,85	14,39	77,63	95,88	3,05	12,47	71,09	86,61
Veneto	1,33	3,72	22,07	27,12	0,93	3,54	21,72	26,19
Friuli-Venezia Giulia	0,51	1,86	16,38	18,74	0,46	1,35	15,49	17,29
Liguria	2,95	9,91	26,10	38,96	3,07	9,25	26,30	38,61
Emilia-Romagna	2,34	3,25	17,64	23,23	2,24	2,76	18,38	23,39
Tuscany	0,25	0,65	12,33	13,23	0,20	0,57	10,75	11,51
Umbria	0,28	0,69	9,52	10,49	0,20	0,46	9,49	10,15
Marche	0,42	0,92	7,98	9,31	0,32	0,71	7,81	8,83
Lazio	1,37	2,13	9,32	12,82	1,13	2,46	9,06	12,66
Abruzzo	0,92	1,66	9,06	11,64	0,95	1,55	10,03	12,53
Molise	0,89	0,76	2,94	4,60	0,84	0,51	2,73	4,09
Campania	4,89	3,71	12,90	21,50	4,07	3,73	13,00	20,81
Puglia	2,74	1,75	11,73	16,22	2,50	1,56	11,64	15,70
Basilicata	1,26	0,67	6,45	8,38	1,02	0,61	5,74	7,37
Calabria	1,02	0,94	6,62	8,57	0,82	0,78	6,00	7,60
Sicilia	4,44	1,57	7,26	13,26	3,44	2,16	6,21	11,82
Sardinia	0,31	0,51	4,15	4,96	0,29	0,50	4,50	5,29
Italy	***1,73***	***2,10***	***12,39***	***16,22***	***1,47***	***1,96***	***12,15***	***15,58***
- North-West	*0,44*	*3,11*	*16,84*	*20,39*	*0,37*	*2,50*	*16,09*	*18,97*
- North-East	*1,85*	*3,60*	*20,84*	*26,29*	*1,63*	*3,20*	*20,94*	*25,76*
- Centre	*0,61*	*1,14*	*10,01*	*11,76*	*0,49*	*1,12*	*9,40*	*11,00*
- South & Islands	*2,56*	*1,55*	*8,42*	*12,53*	*2,19*	*1,62*	*8,24*	*12,05*

(continued)

Source: INEA calculations using ISTAT figures, Statistiche dell'Agricoltura, Statistiche ambientali, Dati congiunturali sui mezzi di produzione (data on-line).

Tab. 17a - Plant protection products distributed for agricultural use, classified by toxicity (*continued*)

Ratio of quantity of plant protection products distributed for agricultural use to "treatable" area (kg/ha of treatable area)

Region	Year								Variation			
	1999				2000				1997/2000			
	Highly toxic or toxic	Noxious	Not classifiable	Total	Highly toxic or toxic	Noxious	Not classifiable	Total	Highly toxic or toxic	Noxious	Not classifiable	Total
Piemonte	0,27	2,26	19,09	21,62	0,30	2,48	22,29	25,07	-27,45	-22,52	2,94	-0,78
Valle d'Aosta	0,07	0,59	10,76	11,41	0,08	1,07	23,94	25,09	-	-	-	-
Lombardy	0,29	1,75	10,23	12,27	0,32	1,68	11,37	13,37	-5,63	-37,53	-4,83	-10,71
Trentino-Alto Adige	2,73	11,42	72,33	86,48	3,23	10,59	80,56	94,38	-16,01	-26,44	3,76	-1,56
Veneto	0,88	3,15	21,09	25,13	0,95	2,77	23,16	26,89	-28,66	-25,39	4,96	-0,85
Friuli-Venezia Giulia	0,42	1,31	15,00	16,72	0,41	1,25	18,33	19,98	-20,14	-33,00	11,91	6,59
Liguria	2,64	4,00	19,86	26,51	3,28	5,82	30,05	39,15	11,33	-41,29	15,11	0,47
Emilia-Romagna	2,08	2,28	17,81	22,18	2,07	2,35	21,12	25,53	-11,63	-27,72	19,70	9,91
Tuscany	0,15	0,41	10,60	11,17	0,20	0,39	11,98	12,57	-18,03	-40,37	-2,82	-4,95
Umbria	0,18	0,30	9,96	10,44	0,18	0,19	10,65	11,02	-35,74	-72,21	11,94	5,12
Marche	0,25	0,45	7,06	7,76	0,32	0,52	8,98	9,82	-23,69	-43,50	12,55	5,39
Lazio	1,13	2,28	8,48	11,88	1,09	2,28	10,71	14,08	-20,15	7,10	14,90	9,86
Abruzzo	0,90	1,21	10,48	12,59	0,96	1,42	15,79	18,16	4,43	-14,58	74,18	56,02
Molise	0,61	0,63	2,60	3,84	0,65	0,55	3,18	4,39	-26,82	-27,55	8,08	-4,60
Campania	3,72	3,54	12,31	19,57	3,23	3,80	13,74	20,77	-33,93	2,61	6,46	-3,39
Puglia	2,58	1,45	12,33	16,36	2,60	1,38	12,76	16,74	-5,36	-20,86	8,78	3,20
Basilicata	0,98	0,72	6,29	7,99	0,75	0,70	6,23	7,67	-40,47	3,76	-3,48	-8,44
Calabria	0,72	0,77	6,67	8,16	0,79	0,83	7,99	9,62	-22,37	-10,99	20,85	12,23
Sicilia	2,70	2,19	5,43	10,32	3,11	2,02	6,93	12,06	-29,91	28,95	-4,60	-9,10
Sardinia	0,23	0,58	4,37	5,19	0,24	1,03	4,69	5,96	-22,14	101,96	13,14	20,04
Italy	***1,34***	***1,76***	***11,73***	***14,83***	***1,36***	***1,76***	***13,63***	***16,75***	***-21,34***	***-16,34***	***10,04***	***3,27***
- North-West	*0,34*	*2,05*	*14,71*	*17,11*	*0,37*	*2,13*	*16,83*	*19,33*	*-15,56*	*-31,29*	*-0,08*	*-5,17*
- North-East	*1,51*	*2,77*	*20,34*	*24,62*	*1,54*	*2,63*	*23,28*	*27,44*	*-16,78*	*-27,11*	*11,69*	*4,37*
- Centre	*0,45*	*0,93*	*9,05*	*10,43*	*0,46*	*0,88*	*10,76*	*12,10*	*-25,26*	*-22,82*	*7,52*	*2,87*
- South & Islands	*1,98*	*1,58*	*8,26*	*11,82*	*2,02*	*1,62*	*9,45*	*13,09*	*-21,41*	*4,54*	*12,27*	*4,43*

Source: INEA calculations using ISTAT figures, Statistiche dell'Agricoltura, Statistiche ambientali, Dati congiunturali sui mezzi di produzione (data on-line).

Tab. 17b - Active ingredients contained in plant protection products

Ratio of the quantity of active ingredients contained in plant protection products distributed for agricultural use to treatable area (kg/ha of treatable area)

Region	Year				Variation
	1997	1998	1999	2000	1997/2000
Piemonte	15,12	14,48	13,78	15,92	5,27
Valle d'Aosta[a]	-	-	5,90	11,26	-
Lombardy	6,56	6,41	5,89	6,32	-3,61
Trentino-Alto Adige	57,21	51,06	50,80	54,27	-5,14
Veneto	13,01	12,81	12,72	13,64	4,81
Friuli-Venezia Giulia	8,57	8,15	7,92	9,85	15,03
Liguria	21,85	22,73	14,92	21,75	-0,48
Emilia-Romagna	10,39	10,68	10,17	11,76	13,18
Tuscany	7,39	6,66	6,40	6,78	-8,29
Umbria	5,21	5,34	5,74	5,84	12,14
Marche	4,14	4,36	3,92	4,73	14,15
Lazio	6,38	6,21	5,97	6,78	6,21
Abruzzo	5,82	6,08	6,25	9,28	59,39
Molise	1,39	1,52	1,50	1,79	28,58
Campania	11,25	10,46	9,76	10,00	-11,09
Puglia	6,81	6,80	7,31	7,80	14,48
Basilicata	4,21	3,70	4,01	4,10	-2,54
Calabria	4,27	4,07	4,56	5,22	22,16
Sicilia	8,93	7,37	6,29	7,27	-18,64
Sardinia	2,73	3,09	3,10	3,75	37,22
Italy	***8,23***	***7,97***	***7,70***	***8,66***	***5,23***
- North-West	*10,95*	*10,50*	*9,89*	*11,09*	*1,29*
- North-East	*12,51*	*12,46*	*12,08*	*13,46*	*7,60*
- Centre	*6,00*	*5,80*	*5,58*	*6,17*	*2,80*
- South & Islands	*6,50*	*6,14*	*6,03*	*6,77*	*4,02*

Source: INEA calculations using ISTAT figures, Statistiche dell'Agricoltura, various years.

Note:

[a] Figures for 1997 and 1998 regarding Valle d'Aosta are included in Piemonte.

Tab. 17c - Use of plant protection products

Ratio of quantity of plant protection products distributed for agricultural use to UAA (kg/ha of UAA)

Region	Year															
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Piemonte	14,62	15,28	15,55	14,41	14,45	14,52	12,35	11,74	13,86	14,06	15,34	13,84	15,36	15,27	14,23	15,18
Valle D'Aosta	0,48	1,18	0,84	1,35	1,55	0,77	0,67	0,38	0,43	0,88	0,64	0,71		0,28	0,32	0,55
Lombardy	12,15	12,52	13,35	13,90	12,67	12,59	12,28	10,61	11,70	10,75	11,10	11,26	10,31	10,14	8,54	9,25
Trentino-Alto Adige	11,91	13,78	13,59	15,89	13,89	12,35	11,29	12,61	13,62	13,91	15,05	14,76	13,89	13,67	13,03	12,28
Veneto	20,33	21,62	23,74	27,40	27,36	25,92	23,35	23,17	22,44	21,18	22,69	21,73	22,00	21,27	20,62	20,98
Friuli-Venezia Giulia	12,41	13,69	12,45	13,63	14,73	14,17	15,72	14,97	17,57	16,31	17,37	15,03	14,44	13,92	13,19	15,63
Liguria	20,28	26,25	27,41	30,94	29,57	33,53	33,35	28,40	30,15	24,81	21,46	18,81	18,21	16,80	13,26	17,54
Emilia-Romagna	17,63	20,17	20,22	24,94	25,36	25,11	22,72	22,31	22,23	21,47	22,30	21,73	20,34	20,64	19,58	22,11
Tuscany	7,75	7,31	8,62	8,22	7,96	8,18	7,13	8,06	7,86	6,65	7,01	7,38	9,59	8,94	8,55	9,61
Umbria	5,69	5,72	8,66	8,86	8,58	8,93	7,42	7,70	8,20	7,06	7,27	6,54	7,65	7,67	7,71	7,86
Marche	8,71	9,76	10,55	9,96	9,95	10,88	8,85	9,91	10,29	8,16	7,87	7,52	7,70	7,42	6,65	8,19
Lazio	11,65	13,01	18,89	18,46	16,56	16,98	12,92	10,31	11,08	9,52	10,01	9,89	8,85	9,01	8,49	9,13
Abruzzo	8,24	8,24	9,86	10,09	9,36	10,14	7,69	7,79	8,74	8,09	8,22	9,29	7,60	7,92	8,07	10,66
Molise	2,89	3,62	3,27	3,69	3,41	3,82	3,11	3,20	3,89	3,50	3,62	2,66	3,93	3,29	3,11	3,49
Campania	21,47	22,01	23,64	24,05	22,85	21,79	18,72	17,20	16,83	17,06	16,87	16,47	17,17	16,57	15,59	16,16
Puglia	11,09	11,68	14,28	12,82	11,04	10,86	11,04	11,95	10,96	10,92	12,54	14,36	13,79	13,77	14,54	14,93
Basilicata	2,45	4,75	4,92	5,01	3,99	3,75	3,73	3,57	4,08	3,55	3,95	4,65	5,33	4,66	4,78	4,88
Calabria	5,85	5,11	6,19	6,33	5,93	6,80	5,93	5,70	6,50	5,54	5,83	4,77	6,17	5,56	5,96	6,83
Sicily	8,85	10,62	11,38	11,77	10,37	11,08	10,30	10,22	10,62	8,57	9,25	9,06	9,24	8,51	7,75	8,75
Sardinia	1,80	1,79	1,74	3,24	3,16	3,10	2,39	3,70	3,48	2,29	1,46	1,61	2,20	2,16	2,13	2,70
Italy	***10,69***	***11,59***	***12,79***	***13,47***	***12,78***	***12,79***	***11,45***	***11,31***	***11,65***	***10,74***	***11,28***	***11,17***	***11,26***	***11,04***	***10,54***	***11,30***
- North-West	*13,20*	*13,98*	*14,50*	*14,38*	*13,75*	*13,82*	*12,66*	*11,40*	*12,91*	*12,40*	*13,04*	*12,35*	*12,62*	*12,43*	*11,09*	*12,04*
- North-East	*17,20*	*19,12*	*19,69*	*23,40*	*23,34*	*22,43*	*20,55*	*20,44*	*20,61*	*19,79*	*20,91*	*20,05*	*19,34*	*19,13*	*18,28*	*19,60*
- Centre	*8,83*	*9,30*	*12,14*	*11,79*	*11,09*	*11,55*	*9,30*	*9,08*	*9,35*	*7,86*	*8,11*	*8,02*	*8,67*	*8,45*	*7,99*	*8,91*
- South & Islands	*8,04*	*8,76*	*9,81*	*9,98*	*9,00*	*9,15*	*8,30*	*8,55*	*8,55*	*7,68*	*8,07*	*8,41*	*8,62*	*8,31*	*8,24*	*9,19*

Source: INEA calculations using ISTAT figures, Statistiche dell'Agricoltura, various years.

Note:

[a] Figures for 1997 regarding Valle d'Aosta are included in Piemonte.

Tab. 18 - Methane emissions

Amount of methane emitted by the agriculture sector (tonnes)

Region	Year				Variation
	1994	1997	1998	2000	1994/2000
Piemonte	70.122	63.222	66.136	68.407	*-2,45*
Valle d'Aosta	2.074	2.611	2.809	3.160	*52,40*
Lombardy	122.180	125.616	120.764	123.027	*0,69*
Trentino-Alto Adige	16.651	17.792	17.367	19.087	*14,63*
Veneto	73.280	59.351	63.148	66.661	*-9,03*
Friuli-Venezia Giulia	10.730	7.043	6.745	7.556	*-29,58*
Liguria	2.339	3.084	2.198	2.524	*7,90*
Emilia-Romagna	60.439	51.590	53.914	57.004	*-5,68*
Tuscany	28.705	23.229	21.936	29.490	*2,73*
Umbria	11.141	10.103	9.339	12.432	*11,58*
Marche	12.436	12.168	9.365	11.684	*-6,05*
Lazio	42.028	43.109	39.779	41.731	*-0,71*
Abruzzo	18.039	15.048	14.685	19.230	*6,60*
Molise	7.492	6.866	7.298	7.713	*2,96*
Campania	27.993	25.876	25.180	27.682	*-1,11*
Puglia	27.172	23.483	22.530	28.922	*6,44*
Basilicata	19.700	17.056	17.222	18.393	*-6,63*
Calabria	23.491	24.382	22.679	24.626	*4,83*
Sicily	51.705	67.856	49.773	46.194	*-10,66*
Sardinia	91.865	122.101	115.941	92.289	*0,46*
Italy	***719.583***	***721.587***	***688.807***	***707.812***	***-1,64***
- North-West	*196.715*	*194.533*	*191.907*	*197.117*	*0,20*
- North-East	*161.101*	*135.777*	*141.173*	*150.308*	*-6,70*
- Centre	*94.311*	*88.609*	*80.419*	*95.337*	*1,09*
- South & Islands	*267.457*	*302.668*	*275.308*	*265.050*	*-0,90*

Source: ELBA model (Environmental Liveliness and Blent Agriculture), University of Bologna.

Tab. 19 - Ammonia emissions

Amount of ammonia emitted by the agriculture sector (tonnes)

Region	Year				Variation
	1994	1997	1998	2000	1994/2000
Piemonte	33.746	31.188	31.489	26.175	-22,43
Valle d'Aosta	762	985	1.080	804	5,55
Lombardy	66.988	69.814	64.615	52.240	-22,02
Trentino-Alto Adige	4.932	5.268	5.165	4.268	-13,46
Veneto	34.774	28.581	30.437	25.021	-28,05
Friuli-Venezia Giulia	6.077	5.127	4.277	2.730	-55,08
Liguria	715	964	669	560	-21,67
Emilia-Romagna	35.058	33.032	30.266	28.062	-19,96
Tuscany	9.049	7.774	7.220	6.764	-25,25
Umbria	5.328	5.067	4.598	3.681	-30,90
Marche	5.090	5.184	3.868	3.861	-24,14
Lazio	14.912	16.127	14.277	10.278	-31,08
Abruzzo	6.110	5.549	5.573	4.684	-23,34
Molise	2.812	2.472	2.750	1.989	-29,28
Campania	11.412	11.053	10.406	7.873	-31,01
Puglia	6.734	6.883	6.764	5.489	-18,50
Basilicata	5.016	4.764	4.890	3.507	-30,08
Calabria	6.614	7.179	6.691	5.012	-24,22
Sicily	15.449	21.307	14.549	11.252	-27,17
Sardinia	19.624	25.031	22.733	19.847	1,14
Italy	***291.203***	***293.346***	***272.318***	***224.098***	-23,04
- North-West	*102.210*	*102.950*	*97.853*	*79.779*	-21,95
- North-East	*80.842*	*72.007*	*70.146*	*60.081*	-25,68
- Centre	*34.379*	*34.152*	*29.963*	*24.585*	-28,49
- South & Islands	*73.772*	*84.237*	*74.356*	*59.653*	-19,14

Source: ELBA model (Environmental Liveliness and Blent Agriculture), University of Bologna.

Tab. 20 - Carbon dioxide emissions

Amount of carbon dioxide emitted by the agriculture sector ('000 tonnes)

Region	Year	
	1994	1998
Piemonte	752,14	771,93
Valle d'Aosta	4,00	4,11
Lombardy	1.346,07	1.381,48
Trentino-Alto Adige	118,12	121,23
Veneto	939,75	964,47
Friuli-Venezia Giulia	179,94	184,68
Liguria	109,52	112,40
Emilia-Romagna	1.037,05	1.064,33
Tuscany	473,15	485,60
Umbria	252,27	258,90
Marche	302,89	310,86
Lazio	442,81	454,46
Abruzzo	170,13	174,61
Molise	99,21	101,82
Campania	637,17	653,94
Puglia	849,68	872,04
Basilicata	221,70	227,53
Calabria	193,80	198,90
Sicily	496,99	510,07
Sardinia	280,98	288,38
Italy	***8.907,39***	***9.141,73***
- North-West	*2.211,74*	*2.269,92*
- North-East	*2.274,86*	*2.334,71*
- Centre	*1.471,12*	*1.509,82*
- South & Islands	*2.949,68*	*3.027,28*

Source: ELBA model (Environmental Liveliness and Blent Agriculture), University of Bologna.

Tab. 21 - Direct use of energy

Ratio of the amount of energy consumed in agriculture to UAA (Giga Joules/ha of UAA)

	Year			Variation
	1998	1999	2000	1998/2000
Italy				
Number of farms	2.984	3.268	2.935	*-1,64*
Average UAA	22,93	24,37	24,84	*8,32*
Quintals per farm	23,43	24,78	23,85	*1,82*
Quintals per ha	1,02	1,02	0,96	*-5,99*
Quintals total	69.902	80.982	70.008	*0,15*
Expenditure per farm (euro)	998	1.135	1.304	*30,68*
Expenditure per ha (euro)	44	47	53	*20,65*
GJ per farm	121,73	128,86	123,92	*1,80*
GJ per ha	***5,31***	***5,29***	***4,99***	***-6,01***
GJ total	363.237	421.111	363.713	*0,13*
North-West				
Number of farms	222	240	181	*-18,47*
Average UAA	12,78	18,87	22,36	*74,91*
Quintals per farm	17,17	16,31	28,96	*68,61*
Quintals per ha	1,34	0,86	1,30	*-3,60*
Quintals total	3.813	3.915	5.241	*37,47*
Expenditure per farm (euro)	793	766	1.527	*92,57*
Expenditure per ha (euro)	62	41	68	*10,10*
GJ per farm	89,39	85,37	151,11	*69,04*
GJ per ha	***6,99***	***4,52***	***6,76***	***-3,36***
GJ total	19.845	20.489	27.350	*37,82*
Centre				
Number of farms	533	504	483	*-9,38*
Average UAA	23,62	24,76	24,18	*2,36*
Quintals per farm	28,05	31,44	32,20	*14,80*
Quintals per ha	1,19	1,27	1,33	*12,15*
Quintals total	14.950	15.844	15.552	*4,03*
Expenditure per farm (euro)	1.094	1.379	1.764	*61,17*
Expenditure per ha (euro)	46	56	73	*57,45*
GJ per farm	145,59	163,30	167,29	*14,91*
GJ per ha	***6,16***	***6,60***	***6,92***	***12,25***
GJ total	77.601	82.304	80.803	*4,13*
South & Islands				
Number of farms	2.229	2.524	2.271	*1,88*
Average UAA	23,77	24,81	25,17	*5,88*
Quintals per farm	22,94	24,26	21,67	*-5,54*
Quintals per ha	0,97	0,98	0,86	*-10,79*
Quintals total	51.139	61.223	49.214	*-3,76*
Expenditure per farm (euro)	995	1.121	1.188	*19,42*
Expenditure per ha (euro)	42	45	47	*12,79*
GJ per farm	119,24	126,12	112,53	*-5,63*
GJ per ha	***5,02***	***5,08***	***4,47***	***-10,87***
GJ total	265.790	318.318	255.560	*-3,85*

Source: INEA calculations using FADN figures, various years.

Tab. 22 - Nitrogen balance

Ratio of the difference between inputs and uptakes of nitrogen to UAA (kg/ha of UAA)

Region	Year				Variation
	1994	1997	1998	2000	1994/2000
Piemonte	54,60	45,33	35,97	53,76	*-1,54*
Valle d'Aosta	17,46	23,44	23,88	16,47	*-5,67*
Lombardy	107,70	112,07	104,51	130,62	*21,28*
Trentino-Alto Adige	9,51	13,18	9,82	0,48	*-94,91*
Veneto	43,58	41,50	40,92	103,49	*137,49*
Friuli-Venezia Giulia	65,47	38,45	14,44	49,36	*-24,60*
Liguria	45,59	66,45	38,15	5,66	*-87,60*
Emilia-Romagna	75,66	45,56	28,48	47,98	*-36,58*
Tuscany	45,64	47,88	46,71	17,03	*-62,68*
Umbria	46,95	68,68	68,74	45,86	*-2,33*
Marche	20,39	27,32	22,18	23,54	*15,50*
Lazio	21,41	30,42	25,92	30,54	*42,65*
Abruzzo	17,03	18,25	19,14	26,59	*56,13*
Molise	30,98	25,44	31,60	7,48	*-75,85*
Campania	18,08	33,31	33,78	46,35	*156,41*
Puglia	3,62	6,47	-3,40	12,29	*239,61*
Basilicata	5,82	20,78	10,12	14,00	*140,77*
Calabria	18,31	15,23	8,83	17,31	*-5,43*
Sicily	12,61	15,77	1,88	28,24	*124,03*
Sardinia	22,70	27,92	27,85	20,25	*-10,83*
Italy	***35,21***	***35,73***	***28,99***	***40,06***	***13,77***
- North-West	*76,93*	*75,63*	*67,03*	*85,19*	*10,74*
- North-East	*54,47*	*38,89*	*28,33*	*58,46*	*7,31*
- Centre	*32,78*	*41,03*	*38,08*	*27,14*	*-17,22*
- South & Islands	*14,40*	*19,01*	*13,05*	*22,04*	*53,08*

Source: ELBA model (Environmental Liveliness and Blent Agriculture), University of Bologna.

Tab. 23 - Potential leaching of nitrates

Ratio of amount of leached nitrogen to UAA (kg/ha of UAA, 2000)

Region	Potential leaching[(a)]		
	media	max	min
Piemonte	11,09	15,76	0,15
Valle d'Aosta	-	-	-
Liguria	-	-	-
Lombardy	15,38	23,79	1,26
Trentino-Alto Adige	-	-	-
Veneto	15,31	25,81	1,04
Friuli-Venezia Giulia	18,85	19,41	1,29
Emilia-Romagna	13,53	22,72	7,34
Tuscany	10,73	16,30	4,66
Umbria	13,03	13,34	11,81
Marche	11,34	14,42	9,48
Lazio	11,29	15,49	6,85
Abruzzo	4,75	8,14	3,63
Molise	16,50	18,92	9,19
Campania	12,10	15,47	6,87
Puglia	12,71	17,41	6,39
Basilicata	15,30	18,26	12,03
Calabria	7,58	14,99	2,50
Sicily	10,15	23,39	1,01
Sardinia	4,76	7,54	1,70
Italy	***11,37***	***25,81***	***0,15***
- North-West	*13,14*	*19,60*	*0,68*
- North-East	*14,85*	*23,41*	*4,30*
- Centre	*11,38*	*15,19*	*7,47*
- South & Islands	*9,66*	*15,60*	*4,18*

Source: ELBA model (Environmental Liveliness and Blent Agriculture), University of Bologna.

Note:

[(a)] For Valle d'Aosta, Liguria and Trentino Alto Adige, figures are missing because information about land use was not available.

Tab. 24a - Fertiliser use

Ratio of amount of fertilisers distributed for agriculture use to fertilisable area (kg/ha of fertilisable area)

Region	Year								R of I
	1990	1993	1995	1996	1997	1998	1999	2000	1990-2000
Piemonte	253	277	235	206	209	186	187	202	*-2,03*
Valle d'Aosta	524	126	34	10	79	32	24	43	*-20,32*
Lombardy	321	359	301	300	330	286	289	293	*-0,81*
Trentino-Alto Adige	205	334	164	200	222	199	174	238	*1,36*
Veneto	277	340	269	277	325	281	310	320	*1,33*
Friuli-Venezia Giulia	279	340	302	218	300	238	296	327	*1,45*
Liguria	88	467	330	478	352	131	138	175	*6,44*
Emilia-Romagna	209	240	225	195	212	156	161	175	*-1,58*
Tuscany	137	203	149	140	153	137	124	131	*-0,43*
Umbria	159	400	146	161	185	183	172	183	*1,29*
Marche	156	176	133	147	149	141	142	170	*0,80*
Lazio	159	157	120	134	134	129	123	163	*0,21*
Abruzzo	189	171	121	137	127	138	119	164	*-1,28*
Molise	90	114	71	86	79	97	72	68	*-2,54*
Campania	135	157	131	146	169	161	149	175	*2,39*
Puglia	103	142	117	114	131	100	93	100	*-0,30*
Basilicata	60	83	72	73	93	66	57	61	*0,15*
Calabria	76	111	110	109	109	81	78	79	*0,43*
Sicily	104	146	93	71	105	89	84	121	*1,39*
Sardinia	89	114	53	53	40	77	116	89	*0,01*
Italy	***166***	***210***	***164***	***157***	***171***	***150***	***150***	***167***	***0,03***
- North-West	*285*	*324*	*272*	*261*	*273*	*236*	*236*	*248*	*-1,24*
- North-East	*239*	*287*	*246*	*226*	*261*	*209*	*227*	*244*	*0,18*
- Centre	*151*	*211*	*136*	*143*	*151*	*142*	*135*	*156*	*0,29*
- South & Islands	*104*	*135*	*101*	*97*	*110*	*99*	*96*	*109*	*0,45*

Source: INEA calculations using ISTAT figures, Statistiche dell'Agricoltura, various years; Statistiche ambientali, various years; Dati congiunturali sui mezzi di produzione (data on-line).

Tab. 24b - Fertiliser use

Ratio of amount of fertilisers distributed for agriculture use to UAA (kg/ha of UAA)

Region	Year											R of I
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	1990-2000
Piemonte	151	153	147	165	156	144	131	127	119	123	122	*-2,10*
Valle d'Aosta	9	4	2	2	1	0	0	1	1	1	1	*-20,26*
Lombardy	227	232	239	257	215	220	218	227	210	201	203	*-1,10*
Trentino-Alto Adige	27	34	52	46	32	23	31	32	31	26	31	*1,31*
Veneto	224	249	248	268	228	221	230	263	229	254	250	*1,09*
Friuli-Venezia Giulia	218	252	258	260	211	229	168	231	192	234	256	*1,59*
Liguria	36	32	63	170	138	141	231	165	57	69	79	*8,06*
Emilia-Romagna	184	184	201	209	205	200	174	186	138	142	152	*-1,90*
Tuscany	99	100	104	128	114	102	106	111	106	95	100	*0,11*
Umbria	113	109	115	269	113	98	112	135	138	127	131	*1,50*
Marche	131	136	127	148	126	112	127	123	119	122	142	*0,84*
Lazio	107	106	110	110	98	84	93	92	92	88	105	*-0,11*
Abruzzo	111	137	131	98	87	70	83	83	87	76	96	*-1,40*
Molise	70	65	78	91	74	54	68	67	78	58	54	*-2,66*
Campania	105	105	113	123	119	103	118	135	128	118	136	*2,65*
Puglia	90	101	113	116	115	98	99	111	87	83	89	*-0,12*
Basilicata	37	46	39	43	35	38	45	59	41	34	39	*0,45*
Calabria	51	59	75	75	80	74	77	78	59	57	56	*0,92*
Sicily	75	65	86	93	81	62	50	73	64	63	88	*1,57*
Sardinia	35	29	42	40	25	20	20	18	32	48	40	*1,42*
Italy	***114***	***118***	***125***	***138***	***120***	***110***	***110***	***119***	***106***	***107***	***116***	***0,19***
- North-West	*176*	*178*	*180*	*201*	*176*	*173*	*169*	*169*	*155*	*153*	*155*	*-1,29*
- North-East	*176*	*188*	*199*	*209*	*188*	*183*	*170*	*192*	*155*	*169*	*174*	*-0,12*
- Centre	*110*	*110*	*112*	*148*	*112*	*98*	*107*	*111*	*109*	*103*	*115*	*0,45*
- South & Islands	*70*	*72*	*83*	*85*	*77*	*64*	*66*	*76*	*68*	*67*	*77*	*0,89*

Source: INEA calculations using ISTAT figures, Statistiche dell'Agricoltura, various years; Statistiche ambientali, various years; Dati congiunturali sui mezzi di produzione (data on-line).

Tab. 25 - Application of an annual fertilising plan

Percentage share of number of farms that adopt an annual fertilising plan in total number of farms

Region	Year		Variation
	1998	2000	1998/2000
Piemonte	24,99	27,63	*10,59*
Valle d'Aosta	23,89	14,97	*-37,35*
Lombardy	24,44	33,57	*37,37*
Trentino-Alto Adige	15,71	19,03	*21,16*
Veneto	29,98	36,51	*21,76*
Friuli-Venezia Giulia	56,14	53,91	*-3,96*
Liguria	40,89	25,57	*-37,46*
Emilia-Romagna	25,07	37,81	*50,80*
Tuscany	42,48	23,22	*-45,33*
Umbria	15,71	33,00	*110,09*
Marche	18,66	29,10	*55,90*
Lazio	13,00	18,33	*40,93*
Abruzzo	14,39	49,61	*244,63*
Molise	17,34	30,04	*73,19*
Campania	17,29	35,80	*107,10*
Puglia	21,62	35,22	*62,88*
Basilicata	16,26	28,59	*75,85*
Calabria	7,67	32,70	*326,02*
Sicily	19,85	28,55	*43,81*
Sardinia	25,12	14,66	*-41,64*
Italy	***21,61***	***30,64***	***41,80***
- North-West	*26,86*	*28,73*	*6,96*
- North-East	*29,84*	*35,69*	*19,61*
- Centre	*21,33*	*23,01*	*7,85*
- South & Islands	*18,02*	*32,08*	*77,99*

Source: INEA calculations using ISTAT figures, Struttura e produzioni delle aziende agricole, 1998; Censimento generale dell'agricoltura, 2003.

Tab. 26 - Irrigation systems

Percentage share of irrigated farms that adopt various irrigation systems

Region	1982					1990				
	Sprinkling	Flooding	Furrowing and lateral seepage	Drip	Other	Sprinkling	Flooding	Furrowing and lateral seepage	Drip	Other
Piemonte	11,25	10,73	87,03	1,19	0,53	18,32	8,13	92,46	4,06	0,57
Valle d'Aosta	31,31	0,20	86,70	0,13	0,08	42,02	0,41	79,98	1,13	0,34
Lombardy	34,42	5,94	72,24	0,75	0,29	42,10	7,30	71,15	1,83	0,45
Trentino-Alto Adige	81,12	0,57	28,29	1,19	0,27	87,41	0,40	14,03	6,09	0,24
Veneto	48,43	1,13	56,39	0,92	0,27	79,15	1,21	49,39	2,49	0,55
Friuli-Venezia Giulia	40,10	0,90	68,55	0,60	17,42	68,34	0,88	61,69	2,62	20,54
Liguria	14,44	4,90	56,31	2,92	32,48	16,35	0,75	51,91	10,31	35,40
Emilia-Romagna	65,02	1,71	37,85	7,35	1,04	84,85	1,48	33,05	16,45	1,92
Tuscany	48,96	0,82	58,27	2,16	1,22	62,94	1,01	55,77	7,61	1,65
Umbria	48,31	1,20	61,70	1,00	0,34	69,39	0,90	54,48	1,80	0,20
Marche	47,21	0,60	63,43	0,85	1,22	68,57	0,68	51,40	4,92	0,30
Lazio	50,54	1,03	51,41	2,50	1,52	54,62	0,70	54,61	10,02	1,71
Abruzzo	42,46	0,58	63,76	0,95	0,43	56,80	1,15	65,12	4,71	1,00
Molise	14,85	0,58	85,87	0,37	1,77	37,62	1,42	72,63	3,04	0,42
Campania	14,28	1,19	86,18	1,15	1,91	21,98	1,99	87,93	2,86	1,13
Puglia	33,28	2,18	57,05	12,09	1,56	42,63	1,64	38,94	48,22	2,63
Basilicata	21,25	4,01	75,84	1,86	3,03	33,62	1,31	78,28	7,67	0,47
Calabria	6,95	5,18	88,02	0,81	0,80	13,40	1,55	93,12	2,79	0,90
Sicily	10,73	46,05	39,15	8,34	0,52	16,36	25,55	47,53	24,87	1,36
Sardinia	26,57	2,29	76,66	2,35	0,21	48,77	1,95	75,00	13,94	0,68
Italy	***28,93***	***8,81***	***63,93***	***3,38***	***3,12***	***40,40***	***5,15***	***62,40***	***12,15***	***3,30***
- North-West	*20,91*	*6,95*	*73,18*	*1,49*	*9,63*	*25,83*	*5,35*	*73,65*	*5,12*	*10,81*
- North-East	*58,37*	*1,19*	*47,04*	*2,95*	*2,36*	*81,22*	*1,12*	*39,70*	*7,25*	*2,79*
- Centre	*49,35*	*0,92*	*56,25*	*1,98*	*1,27*	*59,89*	*0,80*	*54,50*	*7,98*	*1,37*
- South & Islands	*17,67*	*13,92*	*67,57*	*4,61*	*1,15*	*27,64*	*7,41*	*67,69*	*17,18*	*1,32*

(Continued)

Source: INEA calculations using ISTAT figures, Struttura e produzioni delle aziende agricole, 1998; Censimento generale dell'agricoltura, 2003.

Tab. 26 - Irrigation systems (*continued*)

Percentage share of irrigated farms that adopt various irrigation systems

Region	2000				
	Sprinkling	Flooding	Furrowing and lateral seepage	Drip	Other
Piemonte	19,61	6,79	79,82	5,70	2,55
Valle d'Aosta	60,63	0,35	68,98	0,96	2,78
Lombardy	40,67	6,18	64,28	2,34	1,73
Trentino-Alto Adige	84,33	0,16	8,42	25,52	1,18
Veneto	63,39	1,30	41,04	3,36	1,94
Friuli-Venezia Giulia	65,89	0,06	48,82	2,16	15,79
Liguria	29,29	0,09	51,18	10,40	23,19
Emilia-Romagna	65,07	1,32	23,76	19,57	8,05
Tuscany	55,30	0,17	38,34	13,54	5,93
Umbria	53,46	0,00	45,35	5,36	3,24
Marche	61,06	0,08	43,20	5,97	3,04
Lazio	53,87	0,34	41,27	12,35	3,85
Abruzzo	54,01	0,01	44,81	7,34	1,85
Molise	62,21	0,05	31,05	13,85	3,22
Campania	27,68	0,04	73,68	4,25	3,42
Puglia	37,60	0,03	13,20	48,46	7,22
Basilicata	53,75	0,06	41,96	10,82	4,17
Calabria	25,89	0,38	72,19	4,71	2,30
Sicily	52,85	0,61	33,77	16,68	3,06
Sardinia	42,53	0,59	39,90	28,68	1,79
Italy	***45,65***	***1,02***	***44,09***	***15,64***	***4,50***
- North-West	*31,38*	*4,71*	*67,29*	*5,34*	*6,96*
- North-East	*68,27*	*0,97*	*30,53*	*12,03*	*4,57*
- Centre	*55,04*	*0,22*	*41,21*	*11,06*	*4,24*
- South & Islands	*40,09*	*0,27*	*43,11*	*20,39*	*3,92*

Source: INEA calculations using ISTAT figures, Struttura e produzioni delle aziende agricole, 1998; Censimento generale dell'agricoltura, 2003.

Tab. 27a - Irrigated land

Percentage share of irrigated land in UAA

Region	Year			R of I
	1982	1990	2000	1982-2000
Piemonte	16,72	33,27	32,02	*3,48*
Valle d'Aosta	21,59	25,16	42,65	*3,65*
Lombardy	53,80	56,20	54,53	*0,07*
Trentino-Alto Adige	12,39	13,52	13,78	*0,56*
Veneto	24,26	30,74	29,74	*1,08*
Friuli-Venezia Giulia	17,28	24,40	22,50	*1,40*
Liguria	9,66	11,18	10,96	*0,67*
Emilia-Romagna	18,52	22,31	21,05	*0,68*
Tuscany	7,00	6,26	6,30	*-0,56*
Umbria	7,80	9,63	10,86	*1,75*
Marche	6,59	5,74	5,41	*-1,03*
Lazio	11,52	12,96	13,22	*0,73*
Abruzzo	6,75	6,48	6,28	*-0,38*
Molise	2,59	3,88	4,00	*2,32*
Campania	16,38	18,09	16,99	*0,19*
Puglia	10,17	15,60	13,96	*1,68*
Basilicata	5,06	6,79	6,87	*1,62*
Calabria	10,30	13,16	12,16	*0,88*
Sicily	10,06	11,57	13,99	*1,75*
Sardinia	4,01	5,66	5,34	*1,52*
Italy	***10,26***	***18,02***	***17,86***	***2,96***
- North-West	*23,39*	*42,18*	*41,92*	*3,12*
- North-East	*11,73*	*23,89*	*22,86*	*3,57*
- Centre	*5,15*	*8,69*	*8,87*	*2,90*
- South & Islands	*6,47*	*11,00*	*10,91*	*2,79*

Source: INEA calculations using ISTAT figures, Censimento generale dell'agricoltura, various years.

Tab. 27b - Irrigated land

Irrigated land (ha)

Region	Year			R of I
	1982	1990	2000	1982-2000
Piemonte	321.216	372.741	355.800	*0,54*
Valle d'Aosta	21.589	24.307	23.623	*0,47*
Lombardy	625.296	620.636	554.382	*-0,63*
Trentino-Alto Adige	50.631	57.114	57.768	*0,70*
Veneto	221.726	270.892	265.253	*0,95*
Friuli-Venezia Giulia	47.177	62.685	63.202	*1,55*
Liguria	11.164	10.344	7.191	*-2,29*
Emilia-Romagna	235.922	274.953	252.377	*0,36*
Tuscany	69.360	58.092	47.286	*-2,00*
Umbria	32.633	38.148	32.117	*-0,08*
Marche	37.489	31.547	25.070	*-2,10*
Lazio	101.269	108.075	74.052	*-1,63*
Abruzzo	37.302	33.758	29.995	*-1,14*
Molise	6.629	9.734	11.812	*3,09*
Campania	116.134	119.814	86.415	*-1,54*
Puglia	155.084	226.823	248.837	*2,52*
Basilicata	31.682	42.398	42.325	*1,54*
Calabria	74.521	87.310	66.922	*-0,56*
Sicily	170.546	184.967	161.044	*-0,30*
Sardinia	57.342	76.844	62.315	*0,44*
Italy	***2.424.712***	***2.711.182***	***2.467.787***	***0,09***
- North-West	*979.265*	*1.028.028*	*940.997*	*-0,21*
- North-East	*555.456*	*665.644*	*638.600*	*0,74*
- Centre	*240.751*	*235.862*	*178.526*	*-1,56*
- South & Islands	*649.240*	*781.648*	*709.664*	*0,47*

Source: INEA calculations using ISTAT figures, Censimento generale dell'agricoltura, various years.

Tab. 28 - Type of catchment

Number of registered water catchments

Types of supply sources	Abruzzo			Molise			Campania			Basilicata			Puglia			Calabria			Sicily			Sardinia			Total for all Region
	C	S	E	C	S	E	C	S	E	C	S	E	C	S	E	C	S	E	C	S	E	C	S	E	
Canal catchment		6						13									10					1			***30***
Spring catchment								10		4	11			16			10		6	4					***61***
Deep groundwater table catchment using wells	1	10						4		1	11	3	133	206	5		6		3	8	1				***392***
Deep groundwater table catchment using drainage tunnels																	6		2						***8***
Deep groundwater table catchment, wells and drainage tunnels																									***0***
Shallow groundwater table catchment with drainage trenches														1			2								***3***
Shallow groundwater table catchment with wells								27		6							2								***35***
Shallow groundwater table catchment, drainage trenches and wells										1															***1***
Artificial lake intakes (reservoir)		2		2				1			1			7		1	2		7	23		9	3		***58***
Artificial lake intakes (hillside ponds)								3			3											2	1		***9***
Natural lake intakes		2																	1				1		***4***
River intakes using fixed weirs	3	6	1	1				16		1	20		1	1		3	11		4		1	2	3		***74***
River intakes using weirs with adjustable sluices		1					2				2					4	26		5	1	1		3		***45***
Lifting from residual water gathering basins																				2					***2***
Other		3						2		1				6			5		2						***19***
Total	***4***	***30***	***1***	***3***	***0***	***0***	***2***	***76***	***0***	***14***	***48***	***3***	***134***	***237***	***5***	***8***	***80***	***0***	***30***	***38***	***3***	***14***	***11***	***0***	***741***

Source: INEA, POM risorse idriche 1994-1999, 1999.

Legend: *C = continuing*
S = seasonal
E = emergency

Tab. 29 - Protected areas

Number, area and percentage breakdown of protected areas by region (2000)

Region	State areas			Regional areas			Total			Percentage of national territory (%)
	Number	Area (ha)	Area (%)	Number	Area (ha)	Area (%)	Number	Area (ha)	Area (%)	
Piemonte	9	67.474	4,74	51	105.620	7,95	60	173.094	6,29	6,81
Valle d'Aosta	1	25.865	1,82	10	4.033	0,30	11	29.898	1,09	9,16
Lombardy	3	59.937	4,21	75	72.065	5,43	78	132.002	4,79	5,53
Trentino-Alto Adige	55	75.534	5,30	24	207.897	15,65	79	283.431	10,30	20,83
Veneto	14	34.592	2,43	11	58.785	4,43	25	93.377	3,39	5,08
Friuli-Venezia Giulia	3	399	0,03	12	53.091	4,00	15	53.490	1,94	6,81
Liguria	6	3.895	0,27	10	17.803	1,34	16	21.698	0,79	4,00
Emilia-Romagna	20	24.777	1,74	25	58.382	4,40	45	83.159	3,02	3,76
Tuscany	60	73.330	5,15	40	80.588	6,07	100	153.918	5,59	6,70
Umbria	1	18.183	1,28	6	40.875	3,08	7	59.058	2,15	6,98
Marche	4	63.016	4,42	4	21.538	1,62	8	84.554	3,07	8,72
Lazio	32	50.667	3,56	40	156.740	11,80	72	207.407	7,53	12,05
Abruzzo	24	239.250	16,79	15	64.451	4,85	39	303.701	11,03	28,13
Molise	6	6.403	0,45	0	-	0,00	6	6.403	0,23	1,44
Campania	10	187.735	13,18	11	147.100	11,08	21	334.835	12,16	24,63
Puglia	21	126.707	8,89	1	125	0,01	22	126.832	4,61	6,55
Basilicata	10	90.324	6,34	7	34.852	2,62	17	125.176	4,55	12,52
Calabria	20	189.364	13,29	2	750	0,06	22	190.114	6,91	12,61
Sicily	3	-	0,00	17	198.173	14,92	20	198.173	7,20	7,71
Sardinia	16	87.430	6,14	1	5.200	0,39	17	92.630	3,36	3,85
Italy	***318,0***	***1.424.882***	***100,00***	***362***	***1.328.068***	***100,00***	***680***	***2.752.950***	***100,00***	***9,14***
- North-West	*19*	*157.171*	*11,03*	*146,00*	*199.521*	*15,02*	*165*	*356.692*	*12,96*	*6,16*
- North-East	*92*	*135.302*	*9,50*	*72,00*	*378.155*	*28,47*	*164*	*513.457*	*18,65*	*8,28*
- Centre	*97*	*205.196*	*14,40*	*90,00*	*299.741*	*22,57*	*187*	*504.937*	*18,34*	*8,65*
- South & Islands	*110*	*927.213*	*65,07*	*54,00*	*450.651*	*33,93*	*164*	*1.377.864*	*50,05*	*11,20*

Source: Environment Ministry, Nature Conservation Report (3rd updating of the official list of Protected Natural Areas), 2000.

Tab. 30 - Condition of plant species

Number of extinct and endangered plant species included in the "Red List" (1995)

Region	Extinct	Extinct in the wild	Endangered species				
			Severely threatened	Threatened	At minor risk	Vulnerable	Total
Piemonte		6	24	3	160	88	275
Valle d'Aosta		2	5	1	55	18	79
Lombardy		5	14	24	197	75	310
Trentino-Alto Adige		7	27	16	168	61	272
Veneto		6	32	62	53	76	223
Friuli-Venezia Giulia		50	14	34	139	156	343
Liguria		-	40	42	23	15	120
Emilia-Romagna		14	42	36	36	78	192
Tuscany		17	14	15	162	123	314
Umbria		4	15	64	181	49	309
Marche		46	23	93	177	43	336
Lazio		78	41	11	334	177	563
Abruzzo		43	21	37	299	161	518
Molise		24	41	38	245	61	385
Campania		2	4	-	66	38	108
Puglia		5	69	42	9	46	166
Basilicata		1	9	1	86	35	131
Calabria	1	3	14	23	109	107	253
Sicily	6	29	74	123	270	122	589
Sardinia		5	39	41	119	69	268

Source: Italian Botanical Society - WWF, "Regional Red List of Plants of Italy", Camerino, 1997.

Tab. 31 - Wooded land affected by fire

Percentage share of wooded land affected by fire in total wooded land

Region	Year								
	1985	1986	1987	1988	1989	1990	1991	1992	1993
Piemonte	0,34	0,29	0,42	0,34	0,65	4,12	0,17	0,41	0,26
Valle d'Aosta	0,45	0,04	0,06	0,08	0,15	1,32	0,04	0,02	0,01
Lombardy	0,27	0,32	0,40	0,60	0,89	1,60	0,39	0,66	0,94
Trentino-Alto Adige	0,04	0,01	0,04	0,08	0,10	0,24	0,02	0,09	0,16
Veneto	0,27	0,11	0,08	0,40	0,45	0,67	0,11	0,36	0,54
Friuli-Venezia Giulia	0,20	0,31	0,25	0,39	2,15	2,56	0,16	0,41	0,75
Liguria	2,34	2,23	0,97	1,82	3,11	4,92	1,56	1,45	1,51
Emilia-Romagna	0,12	0,02	0,08	0,06	0,21	0,21	0,07	0,11	0,15
Tuscany	0,64	0,13	0,25	0,27	0,64	0,97	0,22	0,18	0,29
Umbria	0,74	0,07	0,20	0,20	0,14	0,36	0,16	0,12	0,70
Marche	0,93	0,05	0,31	0,31	0,17	0,05	0,03	0,26	1,37
Lazio	2,27	0,24	1,12	0,47	0,39	1,34	0,45	0,82	3,05
Abruzzo	0,73	0,04	0,23	0,34	0,33	0,32	0,12	0,40	1,17
Molise	1,48	0,14	0,91	2,93	0,31	0,37	1,26	0,89	1,50
Campania	4,91	0,55	0,80	1,64	0,55	1,43	1,05	1,59	4,51
Puglia	3,63	0,56	1,35	3,20	0,15	1,97	1,08	1,77	2,95
Basilicata	1,52	0,40	0,46	2,36	0,18	0,39	0,11	0,51	1,44
Calabria	2,43	0,86	2,47	2,55	0,62	1,43	0,49	1,51	3,49
Sicily	0,87	1,30	3,09	1,59	0,67	1,30	0,57	0,57	5,76
Sardinia	1,75	0,71	1,63	2,01	1,05	0,91	0,57	0,95	3,93
Italy	***1,13***	***0,40***	***0,72***	***0,88***	***0,66***	***1,42***	***0,36***	***0,60***	***1,54***
- North-West	*0,70*	*0,65*	*0,50*	*0,69*	*1,17*	*3,31*	*0,50*	*0,67*	*0,70*
- North-East	*0,12*	*0,07*	*0,09*	*0,17*	*0,45*	*0,60*	*0,06*	*0,18*	*0,30*
- Centre	*1,05*	*0,14*	*0,45*	*0,31*	*0,46*	*0,87*	*0,24*	*0,32*	*1,07*
- South & Islands	*2,23*	*0,65*	*1,56*	*1,99*	*0,60*	*1,07*	*0,58*	*1,07*	*3,43*

(continued)

Source: ISTAT, Forestry statistics, various years; Agricultural and forestry cultivation, various years; Agriculture, forestry and hunting, various years.

Tab. 31 - Wooded land affected by fire (*continued*)

Percentage share of wooded land affected by fire in total wooded land

Region	Year							R of I
	1994	1995	1996	1997	1998	1999	2000	1985-2000
Piemonte	0,12	0,76	0,04	0,55	0,30	0,48	0,35	*0,22*
Valle d'Aosta	0,03	0,14	0,01	0,47	0,07	0,00	0,01	*-23,35*
Lombardy	0,19	0,37	0,07	1,32	0,70	0,14	0,24	*-0,69*
Trentino-Alto Adige	0,03	0,11	0,04	0,06	0,03	0,01	0,01	*-7,74*
Veneto	0,05	0,04	0,05	0,77	0,05	0,13	0,04	*-11,18*
Friuli-Venezia Giulia	0,22	0,33	0,15	1,08	0,30	0,11	0,04	*-9,38*
Liguria	0,46	0,83	0,32	1,61	1,24	1,67	0,82	*-6,34*
Emilia-Romagna	0,02	0,12	0,02	0,11	0,21	0,03	0,05	*-5,29*
Tuscany	0,26	0,06	0,10	0,37	0,27	0,08	0,12	*-9,79*
Umbria	0,19	0,02	0,04	0,06	0,25	0,06	0,12	*-10,67*
Marche	0,38	0,02	0,03	0,02	0,36	0,13	0,28	*-7,13*
Lazio	0,33	0,26	0,12	1,21	0,50	0,22	1,43	*-2,84*
Abruzzo	0,50	0,11	0,08	0,34	0,53	0,03	0,81	*0,68*
Molise	0,37	0,03	0,15	0,19	0,15	0,03	0,43	*-7,39*
Campania	0,47	0,23	1,04	1,47	0,60	0,44	2,05	*-5,32*
Puglia	1,65	0,47	1,86	1,30	1,43	0,66	4,44	*1,27*
Basilicata	0,24	0,43	0,57	0,76	0,43	0,08	1,91	*1,41*
Calabria	1,02	0,24	0,60	1,64	2,40	0,77	3,03	*1,38*
Sicily	2,69	0,58	0,65	1,93	6,15	2,05	3,61	*9,34*
Sardinia	3,26	0,11	0,07	0,26	2,22	1,15	1,28	*-1,95*
Italy	***0,60***	***0,27***	***0,22***	***0,73***	***0,86***	***0,41***	***0,87***	***-1,57***
- North-West	*0,20*	*0,61*	*0,10*	*0,99*	*0,59*	*0,57*	*0,39*	*-3,67*
- North-East	*0,05*	*0,13*	*0,05*	*0,33*	*0,11*	*0,05*	*0,03*	*-8,37*
- Centre	*0,27*	*0,10*	*0,09*	*0,60*	*0,35*	*0,24*	*0,29*	*-7,72*
- South & Islands	*1,55*	*0,25*	*0,53*	*1,02*	*1,99*	*0,78*	*2,17*	*-0,16*

Source: ISTAT, Forestry statistics, various years; Agricultural and forestry cultivation, various years; Agriculture, forestry and hunting, various years.

Tab. 32a - Organic farming

Percentage share of UAA used for organic farming in total UAA

Region	Year								R of I
	1993	1994	1995	1996	1997	1998	1999	2000	1993-2000
Piemonte	0,30	0,41	0,33	0,35	1,53	1,25	3,36	4,17	*38,96*
Valle d'Aosta	-	0,01	0,34	1,06	0,38	0,00	0,17	0,22	*58,97[a]*
Lombardy	0,35	0,55	0,59	0,77	0,93	0,45	1,22	1,70	*21,96*
Trentino-Alto Adige	0,10	0,22	0,33	0,34	0,35		0,59	0,90	*31,40*
Veneto	0,46	0,65	0,60	0,44	0,70	0,28	0,76	1,54	*16,30*
Friuli-Venezia Giulia	0,95	0,21	0,59	0,27	0,29	0,16	0,33	0,51	*-7,35*
Liguria	0,13	0,22	0,24	0,40	1,61	1,32	2,65	2,59	*45,54*
Emilia-Romagna	0,93	0,96	1,22	2,68	4,29	3,28	6,73	9,13	*33,11*
Tuscany	1,99	1,72	1,87	1,59	2,32	1,25	3,97	6,50	*15,95*
Umbria	0,85	1,44	2,22	3,92	7,12	5,84	8,64	5,74	*26,99*
Marche	0,57	0,71	0,81	1,59	1,64	0,50	3,62	7,10	*36,96*
Lazio	0,26	1,29	1,47	2,02	3,00	2,52	3,36	5,02	*44,74*
Abruzzo	0,12	0,19	0,31	0,65	1,24	0,52	1,37	1,81	*41,11*
Molise	0,54	0,73	1,06	1,60	1,00	0,94	1,86	3,05	*24,24*
Campania	0,14	0,24	0,25	0,55	1,04	0,76	2,37	2,48	*43,01*
Puglia	0,12	0,20	0,99	3,46	7,35	4,57	8,99	10,56	*75,30*
Basilicata	0,11	0,34	0,49	0,60	0,96	1,08	1,53	2,26	*45,32*
Calabria	0,45	0,47	0,54	1,18	5,06	2,87	11,64	16,63	*56,99*
Sicily	1,46	3,88	4,24	7,10	7,81	5,16	9,09	12,68	*31,07*
Sardinia	0,38	1,24	2,78	3,55	14,12	12,42	22,88	30,03	*72,72*
Italy	***0,60***	***1,05***	***1,39***	***2,27***	***4,32***	***3,12***	***6,36***	***8,09***	***38,43***
- North-West	*0,30*	*0,45*	*0,45*	*0,57*	*1,22*	*0,84*	*2,24*	*2,86*	*32,32*
- North-East	*0,66*	*0,69*	*0,83*	*1,39*	*2,17*	*1,54*	*3,29*	*4,57*	*27,41*
- Centre	*1,02*	*1,35*	*1,59*	*2,07*	*3,07*	*2,09*	*4,36*	*6,07*	*24,93*
- South & Islands	*0,51*	*1,28*	*1,86*	*3,28*	*6,74*	*4,94*	*9,78*	*12,48*	*49,02*

Source: INEA calculations using Biobank figures, various years; ISTAT, Struttura e produzioni delle aziende agricole, various years; Censimento generale dell'agricoltura, 2003.

Note:

[a] Rate of increase (R of I) calculated beginning in 1994

Tab. 32b - Organic farming

UAA used for organic farming (ha)

Region	Year								R of I
	1993	1994	1995	1996	1997	1998	1999	2000	1993-2000
Piemonte	3.360	4.598	3.694	3.880	17.933	14.288	38.445	44.557	*38,14*
Valle d'Aosta	-	8	310	950	332	1	144	157	*52,99[(a)]*
Lombardy	3.764	5.997	6.395	8.368	10.321	5.055	13.769	17.658	*21,31*
Trentino-Alto Adige	404	889	1.307	1.437	1.416		2.508	3.715	*31,96*
Veneto	4.033	5.715	5.239	3.829	6.059	2.458	6.732	13.092	*15,86*
Friuli-Venezia Giulia	2.425	541	1.505	706	765	435	924	1.226	*-8,17*
Liguria	105	178	191	341	1.303	1.122	2.235	1.624	*40,82*
Emilia-Romagna	11.221	11.668	14.837	32.710	51.151	40.223	82.222	101.777	*31,74*
Tuscany	19.039	16.322	17.710	15.065	20.961	11.559	36.887	55.752	*14,37*
Umbria	3.423	5.820	8.943	15.866	27.887	21.638	32.423	21.073	*25,51*
Marche	3.107	3.802	4.346	8.594	9.625	2.973	21.683	35.805	*35,74*
Lazio	2.084	10.276	11.686	16.044	24.664	20.607	27.409	36.346	*42,95*
Abruzzo	580	944	1.555	3.183	6.262	2.692	7.182	7.772	*38,32*
Molise	1.293	1.763	2.520	3.824	2.432	2.304	4.717	6.563	*22,51*
Campania	899	1.553	1.564	3.512	6.569	4.986	15.501	14.887	*42,03*
Puglia	1.680	2.800	14.003	49.513	105.240	66.110	130.002	132.932	*72,70*
Basilicata	670	2.010	2.882	3.650	5.736	6.696	9.531	12.174	*43,69*
Calabria	2.878	3.030	3.455	7.627	32.887	18.165	73.291	92.537	*54,31*
Sicily	22.337	59.469	65.074	107.826	122.154	80.560	142.966	162.486	*28,15*
Sardinia	5.135	16.737	37.277	47.248	187.451	164.872	304.487	307.206	*66,77*
Italy	***88.437***	***154.120***	***204.494***	***334.173***	***641.148***	***466.744***	***953.058***	***1.069.339***	***36,56***
- North-West	*7.229*	*10.781*	*10.589*	*13.539*	*29.889*	*20.466*	*54.593*	*63.996*	*31,34*
- North-East	*18.083*	*18.813*	*22.888*	*38.682*	*59.391*	*43.116*	*92.386*	*119.810*	*26,66*
- Centre	*27.653*	*36.220*	*42.686*	*55.569*	*83.137*	*56.777*	*118.402*	*148.976*	*23,43*
- South & Islands	*35.472*	*88.306*	*128.330*	*226.383*	*468.731*	*346.385*	*687.677*	*736.557*	*46,11*

Source: Biobank from figures provided by controlling bodies, various years.

Note:

[(a)] Rate of increase (R of I) calculated beginning in 1994

Tab. 32c - Organic farming

Number of farms that practice organic farming

Region	Year								R of I
	1993	1994	1995	1996	1997	1998	1999	2000	1993-2000
Piemonte	399	374	338	395	1.074	1.793	2.307	2.996	*28,66*
Valle d'Aosta	-	3	2	2	6	6	6	13	*23,30*
Lombardy	166	189	245	407	601	627	1.037	1.225	*28,38* [(a)]
Trentino-Alto Adige	124	190	219	238	264	288	425	526	*19,80*
Veneto	544	617	710	549	721	699	1.016	1.249	*10,95*
Friuli-Venezia Giulia	145	130	131	122	139	127	175	226	*5,70*
Liguria	26	41	50	59	119	136	196	277	*34,41*
Emilia-Romagna	606	702	772	1.277	2.264	3.369	3.870	4.606	*28,86*
Tuscany	321	492	536	673	743	788	1.223	1.619	*22,42*
Umbria	321	476	756	920	1.297	1.496	1.381	837	*12,73*
Marche	97	174	231	331	421	523	1.037	1.736	*43,42*
Lazio	137	365	454	1.031	1.952	1.813	2.063	2.320	*42,43*
Abruzzo	74	93	151	254	449	497	584	639	*30,93*
Molise	110	133	184	250	277	313	447	479	*20,19*
Campania	119	164	186	346	535	1.227	1.678	1.779	*40,23*
Puglia	107	189	383	2.152	4.314	4.827	6.887	6.758	*67,90*
Basilicata	17	27	55	113	194	265	338	434	*49,93*
Calabria	170	219	284	529	1.762	4.960	6.329	8.384	*62,79*
Sicily	1.067	3.545	3.772	6.142	8.326	9.598	9.699	9.616	*31,63*
Sardinia	106	474	1.171	1.507	5.386	8.287	8.490	8.285	*72,43*
Italy	***4.656***	***8.597***	***10.630***	***17.297***	***30.844***	***41.639***	***49.188***	***54.004***	***35,85***
- North-West	*591*	*604*	*633*	*861*	*1.794*	*2.556*	*3.540*	*4.498*	*28,88*
- North-East	*1.419*	*1.639*	*1.832*	*2.186*	*3.388*	*4.483*	*5.486*	*6.607*	*21,20*
- Centre	*876*	*1.507*	*1.977*	*2.955*	*4.413*	*4.620*	*5.704*	*6.512*	*28,50*
- South & Islands	*1.770*	*4.844*	*6.186*	*11.293*	*21.243*	*29.974*	*34.452*	*36.374*	*45,92*

Source: INEA calculations using Biobank figures, various years; ISTAT, Struttura e produzioni delle aziende agricole, various years; Censimento generale dell'agricoltura, 2003.

Note:

[(a)] Rate of increase (R of I) calculated beginning in 1994

Tab. 33a - Agri-environmental measures

Percentage share of UAA affected by agri-environmental measures in total UAA

Region	Year							R of I
	1994	1995	1996	1997	1998	1999	2000	1994-2000
Piemonte	-	18,99	21,90	25,44	30,60	33,92	29,04	*7,33*[(a)]
Valle d'Aosta	11,11	17,41	25,69	49,32	61,68	60,98	66,20	*29,05*
Lombardy	-	0,76	3,16	10,68	14,18	20,25	20,91	*73,77*[(a)]
Trentino-Alto Adige	14,16	49,56	48,69	50,61	0,48	45,48	51,31	*20,19*
Veneto	0,61	2,14	3,35	5,97	8,08	7,86	10,72	*50,76*
Friuli-Venezia Giulia	0,20	0,44	0,83	7,50	5,30	6,63	7,52	*68,26*
Liguria	0,14	0,76	1,50	2,39	16,20	17,03	22,45	*106,35*
Emilia-Romagna	0,39	2,45	4,01	6,11	13,42	18,57	20,07	*75,84*
Tuscany	-	9,12	13,53	21,84	29,09	35,46	29,56	*21,66*[(a)]
Umbria	1,01	2,99	4,87	7,18	11,66	31,47	28,14	*60,75*
Marche	0,38	1,18	3,04	5,10	12,40	15,48	17,54	*72,82*
Lazio	0,78	3,37	6,08	10,59	16,10	16,12	22,86	*61,93*
Abruzzo	-	0,10	0,24	0,49	2,40	4,93	5,66	*96,31*[(a)]
Molise	0,40	0,52	0,89	1,30	2,45	2,48	4,14	*39,64*
Campania	-	-	-	0,28	1,36	4,17	5,13	*106,71*[(c)]
Puglia	-	-	1,49	4,67	6,06	13,27	17,73	*64,00*[(b)]
Basilicata	0,83	2,11	4,68	13,00	23,03	22,99	25,14	*62,83*
Calabria	-	-	0,63	3,65	9,84	12,28	14,73	*87,54*[(b)]
Sicily	0,28	3,59	6,98	10,27	14,05	12,70	17,04	*79,84*
Sardinia	0,20	1,44	5,02	8,55	18,12	21,95	27,54	*102,27*
Italy	***0,70***	***4,81***	***7,00***	***10,82***	***15,57***	***18,84***	***20,81***	***62,35***
- North-West	*0,44*	*9,99*	*12,77*	*18,83*	*23,65*	*27,96*	*26,27*	*79,38*
- North-East	*2,45*	*9,06*	*10,26*	*12,88*	*16,19*	*18,12*	*20,82*	*35,75*
- Centre	*0,46*	*4,90*	*7,91*	*12,66*	*19,12*	*24,71*	*24,90*	*76,84*
- South & Islands	*0,19*	*1,29*	*3,33*	*6,47*	*11,13*	*13,70*	*17,02*	*90,69*

Source: INEA calculations using AGEA figures, various years; ISTAT, Struttura e produzioni delle aziende agricole, various years; Censimento generale dell'agricoltura, 2003.

Note:

[(a)] Rate of increase (R of I) calculated beginning in 1995

[(b)] Rate of increase (R of I) calculated beginning in 1996

[(c)] Rate of increase (R of I) calculated beginning in 1997

Tab. 33b - Agri-environmental measures

UAA affected by agri-environmental measures (ha)

Region	Year							R of I
	1994	1995	1996	1997	1998	1999	2000	1994-2000
Piemonte	-	212.600	245.606	297.517	350.845	388.266	310.252	6,50 [a]
Valle d'Aosta	10.337	16.108	22.946	42.967	53.390	51.337	47.128	24,20
Lombardy	-	8.252	34.352	118.627	159.024	227.795	216.549	72,38 [a]
Trentino-Alto Adige	56.800	198.999	205.116	207.439	204.164	194.028	212.611	20,75
Veneto	5.323	18.798	29.416	51.856	71.425	69.424	91.448	50,12
Friuli-Venezia Giulia	503	1.112	2.160	19.507	14.328	18.288	17.969	66,67
Liguria	114	611	1.274	1.932	13.789	14.373	14.054	98,93
Emilia-Romagna	4.675	29.649	48.988	72.875	164.434	226.767	223.600	73,76
Tuscany	-	86.188	127.848	197.055	270.008	329.552	253.496	19,70 [a]
Umbria	4.092	12.050	19.730	28.137	43.184	118.073	103.330	58,61
Marche	2.054	6.348	16.466	30.028	73.953	92.638	88.407	71,16
Lazio	6.238	26.761	48.351	87.008	131.570	131.406	165.557	59,74
Abruzzo	-	492	1.158	2.472	12.446	25.798	24.289	91,53 [a]
Molise	960	1.246	2.133	3.154	5.995	6.264	8.908	37,47
Campania	-	-	-	1.779	8.923	27.313	30.800	103,98 [c]
Puglia	-	-	21.388	66.800	87.717	191.807	223.200	59,84 [b]
Basilicata	4.870	12.377	28.566	77.590	142.517	143.418	135.191	60,77
Calabria	-	-	4.087	23.695	62.292	77.360	81.983	82,16 [b]
Sicily	4.296	55.130	105.924	160.700	219.447	199.620	218.400	75,28
Sardinia	2.680	19.321	66.794	113.525	240.572	292.201	281.742	94,45
Italy	***102.942***	***706.042***	***1.032.303***	***1.604.663***	***2.330.023***	***2.825.728***	***2.748.914***	***59,88***
- North-West	*10.451*	*237.571*	*304.178*	*461.043*	*577.048*	*681.771*	*587.983*	*77,84*
- North-East	*67.301*	*248.558*	*285.680*	*351.677*	*454.351*	*508.507*	*545.628*	*34,85*
- Centre	*12.384*	*131.347*	*212.395*	*342.228*	*518.715*	*671.669*	*610.790*	*74,53*
- South & Islands	*12.806*	*88.566*	*230.050*	*449.715*	*779.909*	*963.781*	*1.004.513*	*86,49*

Source: INEA calculations using AGEA figures, various years.

Note:

[a] Rate of increase (R of I) calculated beginning in 1995

[b] Rate of increase (R of I) calculated beginning in 1996

[c] Rate of increase (R of I) calculated beginning in 1997

Tab. 34 - Utilised Agricultural Area

Percentage share of UAA in total territory

Region	Year			R of I
	1982	1990	2000	1982-2000
Piemonte	47,99	44,10	42,05	*-0,69*
Valle d'Aosta	30,65	29,60	21,82	*-1,77*
Lombardy	48,71	46,28	43,41	*-0,60*
Trentino-Alto Adige	30,04	31,04	30,46	*0,07*
Veneto	49,68	47,90	46,35	*-0,36*
Friuli-Venezia Giulia	34,73	32,69	30,39	*-0,70*
Liguria	21,32	17,06	11,55	*-3,18*
Emilia-Romagna	57,59	55,71	50,38	*-0,70*
Tuscany	43,06	40,34	37,30	*-0,75*
Umbria	49,46	46,85	43,42	*-0,68*
Marche	58,71	56,65	51,99	*-0,64*
Lazio	51,01	48,40	42,02	*-1,01*
Abruzzo	51,32	48,42	39,84	*-1,32*
Molise	57,76	56,49	48,44	*-0,92*
Campania	52,16	48,73	44,15	*-0,87*
Puglia	78,78	75,10	65,03	*-1,00*
Basilicata	62,70	62,45	53,80	*-0,80*
Calabria	47,98	43,99	36,90	*-1,37*
Sicily	65,92	62,19	49,85	*-1,46*
Sardinia	59,42	56,38	42,46	*-1,75*
Italy	***52,57***	***49,93***	***43,85***	***-0,95***
- North-West	*44,81*	*41,65*	*38,62*	*-0,78*
- North-East	*46,30*	*45,06*	*42,27*	*-0,48*
- Centre	*48,94*	*46,37*	*42,02*	*-0,80*
- South & Islands	*61,12*	*57,98*	*47,97*	*-1,27*

Source: INEA calculations using ISTAT figures, Censimento generale dell'agricoltura, various years.

Tab. 35a - Afforestation index

Percentage share of wooded land in total territory

Region	Year					R of I
	1960	1970	1980	1990	2000	1960-2000
Piemonte	20,81	23,45	23,47	26,13	26,39	*0,77*
Valle d'Aosta	20,30	22,09	23,15	23,95	23,92	*0,53*
Lombardy	20,31	20,37	19,80	20,70	20,68	*0,06*
Trentino-Alto Adige	43,49	43,75	44,29	45,79	46,45	*0,21*
Veneto	13,10	14,12	14,26	14,76	14,80	*0,39*
Friuli-Venezia Giulia	18,86	21,05	21,80	23,29	23,73	*0,74*
Liguria	50,22	51,80	52,25	53,12	53,19	*0,19*
Emilia-Romagna	16,08	16,15	17,11	18,20	18,29	*0,42*
Tuscany	35,80	37,81	37,68	38,72	38,78	*0,26*
Umbria	25,19	29,75	30,73	31,26	31,25	*0,70*
Marche	14,01	15,18	16,04	16,46	16,51	*0,53*
Lazio	20,74	21,02	21,33	22,16	22,19	*0,22*
Abruzzo	18,19	18,61	19,73	20,94	21,08	*0,48*
Molise	14,84	14,76	15,64	15,94	16,00	*0,24*
Campania	20,36	20,44	20,33	21,27	21,28	*0,14*
Puglia	4,51	4,72	4,94	6,00	6,02	*0,93*
Basilicata	16,92	16,99	18,36	19,17	19,20	*0,41*
Calabria	25,67	26,52	28,12	31,80	31,86	*0,70*
Sicily	4,90	7,28	8,09	8,29	8,61	*1,83*
Sardinia	13,32	13,59	16,32	19,69	22,10	*1,65*
Italy	***19,40***	***20,45***	***21,09***	***22,43***	***22,74***	***0,51***
- North-West	*23,32*	*24,76*	*24,63*	*26,29*	*26,41*	*0,40*
- North-East	*21,57*	*22,23*	*22,83*	*23,88*	*24,13*	*0,36*
- Centre	*26,20*	*27,93*	*28,25*	*29,05*	*29,09*	*0,34*
- South & Islands	*13,24*	*13,97*	*15,14*	*16,74*	*17,31*	*0,87*

Source: INEA calculations using ISTAT figures, Statistiche forestali, various years; Dati sulla superficie e le utilizzazioni forestali (data on-line); Annuario statistico, 2003.

Tab. 35b - Wooded land

Extension of wooded land

Region	Year					Variation
	1960	1970	1980	1990	2000	1960/2000
Piemonte	528.500	595.592	596.239	663.748	670.300	*26,83*
Valle d'Aosta	66.241	72.072	75.549	78.152	78.048	*17,82*
Lombardy	484.599	486.079	472.549	493.872	493.523	*1,84*
Trentino-Alto Adige	591.704	595.302	602.712	623.081	632.032	*6,82*
Veneto	241.075	259.863	262.284	271.646	272.359	*12,98*
Friuli-Venezia Giulia	148.242	165.453	171.304	183.014	186.457	*25,78*
Liguria	272.282	280.854	283.251	288.006	288.395	*5,92*
Emilia-Romagna	355.647	357.279	378.535	402.618	404.522	*13,74*
Tuscany	823.112	869.454	866.370	890.260	891.601	*8,32*
Umbria	212.972	251.563	259.858	264.363	264.240	*24,07*
Marche	135.815	147.128	155.514	159.542	160.075	*17,86*
Lazio	357.400	362.248	367.680	381.892	382.492	*7,02*
Abruzzo	195.753	200.344	212.323	225.415	226.825	*15,87*
Molise	65.854	65.490	69.394	70.757	71.022	*7,85*
Campania	276.637	277.792	276.356	289.050	289.154	*4,52*
Puglia	87.386	91.397	95.542	116.118	116.529	*33,35*
Basilicata	169.126	169.795	183.469	191.602	191.913	*13,47*
Calabria	387.096	399.955	424.070	479.517	480.511	*24,13*
Sicily	126.061	187.191	208.109	213.059	221.386	*75,62*
Sardinia	320.779	327.273	393.194	474.382	532.424	*65,98*
Italy	***5.846.281***	***6.162.124***	***6.354.302***	***6.760.094***	***6.853.808***	***17,23***
- North-West	*1.351.622*	*1.434.597*	*1.427.588*	*1.523.778*	*1.530.266*	*13,22*
- North-East	*1.336.668*	*1.377.897*	*1.414.835*	*1.480.359*	*1.495.370*	*11,87*
- Centre	*1.529.299*	*1.630.393*	*1.649.422*	*1.696.057*	*1.698.408*	*11,06*
- South & Islands	*1.628.692*	*1.719.237*	*1.862.457*	*2.059.900*	*2.129.764*	*30,77*

Source: ISTAT, Statistiche forestali, various years; Dati sulla superficie e le utilizzazioni forestali (data on-line).

Tab. 35c - Wooded land by type of timber

Wooded land according to type of timber, 2000

Region	Fustaie				Cedui			Macchia mediterranea	Totale
	Resinose	Latifoglie	Resinose e latifoglie consociate	Totale fustaie	Cedui semplici	Cedui composti	Totale cedui		
Piemonte	112.492	106.811	12.294	231.597	292.365	146.338	438.703	-	*670.300*
Valle d'Aosta	63.895	2.398	3.699	69.992	4.716	3.340	8.056	-	*78.048*
Lombardy	135.048	62.259	10.559	207.866	178.145	107.512	285.657	-	*493.523*
Trentino-Alto Adige	498.351	2.287	44.754	545.392	79.649	6.979	86.628	-	*632.032*
Veneto	122.254	15.565	9.382	147.201	98.264	26.850	125.114	44	*272.359*
Friuli-Venezia Giulia	43.004	35.152	45.250	123.406	36.361	26.650	63.011	40	*186.457*
Liguria	46.266	35.894	5.241	87.401	155.770	41.285	197.055	3.939	*288.395*
Emilia-Romagna	28.993	50.772	16.859	96.624	291.528	16.370	307.898	-	*404.522*
Tuscany	82.719	112.717	16.432	211.868	397.169	183.553	580.722	99.011	*891.601*
Umbria	12.765	8.343	4.685	25.793	195.073	43.374	238.447	-	*264.240*
Marche	10.455	6.075	13.504	30.034	118.526	11.376	129.902	139	*160.075*
Lazio	18.853	73.482	5.634	97.969	238.249	27.829	266.078	18.445	*382.492*
Abruzzo	13.240	75.304	15.237	103.781	76.195	46.446	122.641	403	*226.825*
Molise	3.739	14.474	2.869	21.082	24.498	25.442	49.940	-	*71.022*
Campania	15.308	79.626	6.240	101.174	173.019	8.760	181.779	6.201	*289.154*
Puglia	30.532	15.637	5.238	51.407	47.621	2.389	50.010	15.112	*116.529*
Basilicata	27.342	85.103	10.760	123.205	52.972	3.394	56.366	12.342	*191.913*
Calabria	100.586	169.211	33.238	303.035	134.396	31.987	166.383	11.093	*480.511*
Sicily	31.517	36.625	72.957	141.099	66.655	9.297	75.952	4.335	*221.386*
Sardinia	43.128	178.301	28.311	249.740	173.095	14.505	187.600	95.084	*532.424*
Italy	***1.440.487***	***1.166.036***	***363.143***	***2.969.666***	***2.834.266***	***783.676***	***3.617.942***	***266.188***	***6.853.808***
- North-West	*357.701*	*207.362*	*31.793*	*596.856*	*630.996*	*298.475*	*929.471*	*3.939*	*1.530.266*
- North-East	*692.602*	*103.776*	*116.245*	*912.623*	*505.802*	*76.849*	*582.651*	*84*	*1.495.358*
- Centre	*124.792*	*200.617*	*40.255*	*365.664*	*949.017*	*266.132*	*1.215.149*	*117.595*	*1.698.408*
- South & Islands	*265.392*	*654.281*	*174.850*	*1.094.523*	*748.451*	*142.220*	*890.671*	*144.570*	*2.129.764*

Source: ISTAT, Statistiche agricole e forestali, 2002.

Tab. 36 - Intensification

Percentage share of UAA affected by intensive cultivation (potatoes, vegetables, grapes, citrus, fruit) in total UAA

Region	Year			R of I
	1982	1990	2000	1982-2000
Piemonte	11,63	11,02	9,85	-0,87
Valle d'Aosta	2,22	1,72	1,96	-0,67
Lombardy	4,46	4,13	4,04	-0,52
Trentino-Alto Adige	11,64	11,19	11,41	-0,10
Veneto	15,58	15,18	14,12	-0,52
Friuli-Venezia Giulia	9,97	8,97	9,30	-0,36
Liguria	20,82	17,34	11,38	-3,13
Emilia-Romagna	17,40	17,97	17,46	0,02
Tuscany	14,96	12,35	10,82	-1,69
Umbria	7,02	5,91	5,29	-1,48
Marche	8,94	8,03	6,57	-1,60
Lazio	15,40	14,76	12,06	-1,28
Abruzzo	11,60	13,04	12,45	0,38
Molise	5,89	5,50	4,96	-0,90
Campania	27,37	26,84	22,77	-0,97
Puglia	20,58	19,78	17,00	-1,00
Basilicata	6,84	6,80	6,58	-0,20
Calabria	19,55	18,56	15,58	-1,19
Sicily	24,03	24,71	22,20	-0,42
Sardinia	7,66	6,51	5,42	-1,80
Italy	**14,59**	**14,05**	**12,47**	**-0,82**
- North-West	8,47	7,74	6,95	-1,03
- North-East	15,30	15,24	14,68	-0,22
- Centre	12,74	11,27	9,48	-1,54
- South & Islands	17,13	16,77	14,84	-0,75

Source: INEA calculations using ISTAT figures, Censimento generale dell'agricoltura, various years.

Tab. 37 - Concentration

Ratio of number of farms with <5 ha UAA to number of farms with >50 ha UAA

Region	Year			R of I
	1982	1990	2000	1982-2000
Piemonte	88,20	64,08	26,23	-6,18
Valle d'Aosta	28,44	26,44	20,27	-1,77
Lombardy	32,03	24,37	9,86	-6,01
Trentino-Alto Adige	62,14	58,58	54,08	-0,73
Veneto	140,33	126,68	91,01	-2,25
Friuli-Venezia Giulia	124,70	100,45	41,82	-5,59
Liguria	878,99	872,94	474,94	-3,19
Emilia-Romagna	44,09	33,23	18,36	-4,51
Tuscany	41,36	38,19	36,63	-0,64
Umbria	37,14	35,74	38,02	0,12
Marche	48,87	43,57	32,31	-2,15
Lazio	121,22	122,60	122,17	0,04
Abruzzo	205,10	176,43	123,00	-2,66
Molise	89,88	68,84	64,61	-1,72
Campania	407,44	400,80	366,70	-0,55
Puglia	79,03	78,43	102,52	1,38
Basilicata	30,62	29,24	37,76	1,11
Calabria	134,01	132,20	158,38	0,88
Sicily	101,35	90,20	104,54	0,16
Sardinia	12,14	12,81	18,81	2,33
Italy	**70,12**	**64,06**	**58,24**	**-0,97**
- North-West	62,84	49,11	22,07	-5,36
- North-East	80,70	67,75	44,73	-3,06
- Centre	61,24	58,61	54,76	-0,59
- South & Islands	73,07	70,25	85,52	0,83

Source: INEA calculations using ISTAT figures, Censimento generale dell'agricoltura, various years.

Tab. 38 - Man-made and natural elements

Percentage share of the extension of man-made and natural elements in UAA

Region	*Filari di alberi, siepi (m/ha)*	*Boschetti, macchie di campo (m^2/ha)*	*Fossi, capezzagne (m/ha)*	*Filari di alberi, siepi (m)*	*Boschetti, macchie di campo (m^2)*	*Fossi, capezzagne (m)*
Piemonte	10,58	2,96	40,58	12.126.999	3.399.088	46.532.399
Valle d'Aosta	0,00	0,00	11,12	386	-	962.216
Lombardy	21,10	12,19	42,96	23.654.538	13.666.296	48.167.589
Trentino-Alto Adige	1,45	1,46	6,93	621.170	626.070	2.965.335
Veneto	18,20	22,53	87,71	16.079.731	19.909.311	77.500.792
Friuli-Venezia Giulia	17,08	14,04	79,59	4.619.275	3.798.930	21.529.925
Liguria	7,00	0,00	0,16	596.090	-	14.000
Emilia-Romagna	6,42	20,04	82,99	7.872.079	24.560.085	101.691.545
Tuscany	11,27	19,15	48,41	10.459.318	17.776.281	44.932.565
Umbria	4,78	15,32	14,28	1.771.315	5.673.860	5.291.145
Marche	8,22	19,71	36,01	4.906.351	11.756.690	21.483.330
Lazio	7,06	10,43	23,42	5.772.660	8.521.280	19.135.226
Abruzzo	1,81	1,57	8,97	937.588	813.613	4.645.894
Molise	2,65	7,16	6,99	646.793	1.750.970	1.707.582
Campania	5,70	14,92	10,82	3.728.723	9.764.740	7.081.560
Puglia	0,64	0,51	0,63	933.715	744.500	909.869
Basilicata	2,69	10,49	3,39	1.662.844	6.491.880	2.096.524
Calabria	10,69	9,62	7,18	6.768.900	6.090.850	4.544.340
Sicily	1,56	1,35	1,41	2.429.392	2.102.900	2.206.038
Sardinia	9,27	6,43	3,10	12.311.988	8.536.500	4.117.580
Italy	***8,11***	***10,04***	***28,72***	***117.899.855***	***145.983.844***	***417.515.454***
- North-West	*14,91*	*6,99*	*39,22*	*36.378.013*	*17.065.384*	*95.676.204*
- North-East	*10,40*	*17,42*	*72,56*	*29.192.255*	*48.894.396*	*203.687.597*
- Centre	*8,45*	*16,12*	*33,49*	*22.909.644*	*43.728.111*	*90.842.266*
- South & Islands	*4,20*	*5,18*	*3,90*	*29.419.943*	*36.295.953*	*27.309.387*

Source: INEA calculations using ISTAT figures, Struttura e produzioni delle aziende agricole - 1998.

APPENDIX 2
METHODOLOGY

1. Agricultural employment

Description: the indicator is the percentage share of people employed in agriculture to total employed.

Calculation is also made of the average annual rate of variation from 1991 to 2000.

Period: annually from 1991 to 2000.

Source: ISTAT, Forze di lavoro, various years.

2. Ageing index for farmers

Description: the indicator is calculated as the percentage share of the number of farmers over age 65 in total number of farmers.

Calculation is also made of the average annual rate of variation from 1993 to 2000.

Period: 1993, 1995, 1996, 1997, 1998, 1999, 2000.

Source: ISTAT, Struttura e produzioni delle aziende agricole, various years; Censimento generale dell'agricoltura, 2003.

3. Educational level of farmers

Description: the indicator is calculated as percentage breakdown of farmers by level of education, indicated by type of study completed: university, high school, middle school, elementary school, no certificate.

Period: 1990, 1995, 1997, 1998, 1999.

Source: ISTAT, Struttura e produzioni delle aziende agricole, various years.

4. Breakdown of workers in agriculture

Description: the indicator gives the difference between the rate of men employed (ratio between men employed in agriculture to total workers in agriculture) and the rate of women employed (ratio between women employed in agriculture to total workers in agriculture).

Calculation is also made of the percentage of variation from 1991 to 2000.

Period: annually from 1991 to 2000.

Source: ISTAT, Annuario statistico italiano, various years.

5. Resident population in rural municipalities

Description: the indicator is calculated as the percentage share of resident population in rural municipalities in total population.

Rural municipalities are defined as those with population density of less than 100 inhabitants per sq.km., or a percentage share of agricultural employment higher than 12.5 (twice the European Community average) as of the 1991 census. The number of municipalities thus remains fixed for the period under consideration.

Calculation is also made of the average annual rate of variation from 1991 to 2001.

Period: annually from 1991 to 2001.

Source: ISTAT, Movimento anagrafico dei comuni, various years.

6. Profitability of labour

Description: the indicator, expressed in thousands of 1995 eurolira, is obtained by calculating the ratio of value added of agriculture, forestry and fishing, at basic prices, to work units in agriculture.

Calculation is also made of the average annual rate of variation from 1995 to 2001.

Period: annually from 1995 to 2001.

Source: ISTAT, Conti economici territoriali, various years.

7. Profitability of land

Description: the indicator, expressed in thousands of 1995 eurolira, is obtained by calculating the ratio of value added from agriculture, at basic prices, to Utilised Agricultural Area.

Calculation is also made of the average annual rate of variation from 1988 to 2001.

Period: annually from 1988 to 2001.

Source: ISTAT, Conti economici territoriali, various years; Censimento generale dell'agricoltura, 1993, 2003; Struttura e produzioni delle aziende agricole, various years.

8. Productivity of labour

Description: the indicator, expressed in thousands of 1995 eurolira, gives the ratio of production in agriculture, hunting and forestry to work units in agriculture.

Calculation is also made of the average annual rate of variation from 1980 to 2001.

Period: annually from 1980 to 2001.

Source: ISTAT, Conti economici territoriali, various years.

9. Productivity of land

Description: the indicator, expressed in thousands of 1995 eurolira, gives the ratio of the value of agricultural production to Utilised Agricultural Area.

Calculation is also made of the average annual rate of variation from 1982 to 2000.

Period: 1982, 1990, 2000.

Source: ISTAT, Conti economici territoriali, various years; Censimento generale dell'agricoltura, various years.

10. Marginalisation

Description: the indicator is the percentage share of the number of farms with both Utilised Agricultural Area of less than five hectares and fewer than four European Size Units, to total number of farms

European Size Unit is a multiple of the ecu and is used to measure the Standard Gross Margin attributed to farms. ISTAT uses an average for the years 1993, 1994 and 1995, by which 1 ESU = 1,200 ecu = approximately 1,200 euro.

Calculation is also made of the average annual rate of variation from 1995 to 1999.

Period: 1995, 1997, 1998, 1999.

Source: ISTAT, Struttura e produzioni delle aziende agricole, various years.

11. Diversification in farm holders' activities

Description: the indicator is a percentage breakdown of farms by the amount of time the farm holder works on the farm.

Period: 1993, 1995, 1996, 1997, 1999.

Source: ISTAT, Struttura e produzioni delle aziende agricole, various years.

12. Share of agricultural value added in total value added

Description: the indicator is the percentage share of value added of agriculture, forestry and fishing in total value added, both expressed at basic prices.

Calculation is also made of the average annual rate of variation from 1995 to 2001.

Period: annually from 1995 to 2001.

Source: ISTAT, Conti economici territoriali, various years.

13. Fixed investments in agriculture

Description: the indicator, expressed in thousands of 1995 eurolira, is the sum of gross fixed investments in agriculture.

Calculation is also made of the average annual rate of variation from 1995 to 2001.

Period: annually from 1995 to 2001.

Source: ISTAT, Conti economici territoriali, various years.

ENVIRONMENTAL DIMENSION

14. Herd density

Description: the indicator is the ratio of adult Livestock Units (LU) to Utilised Agricultural Area.

The Livestock unit (LU) is a unit used to compare or to aggregate numbers of animals of different species or categories. By definition, a cow weighting 600 kg and producing 3000 litres of milk per year = 1 LU. Equivalences based on the food requirements of the animals are defined (horses: 0.6; pigs: 0.3; sheep-goats: 0.1; poultry: 0.7).Calculation is also made of the average annual rate of variation from 1970 to 2000.

Period: 1970, 1982, 1990, 2000.

Source: ISTAT, Censimento generale dell'agricoltura, various years.

15. Livestock

Description: the indicator shows the percentage breakdown of livestock by type of breed (poultry, sheep-goats, pigs, horses, cattle).

Period: 1970, 1982, 1990, 2000.

Source: ISTAT, Censimento generale dell'agricoltura, various years.

16. Phosphorus balance

Description: the indicator, expressed in kg of phosphorus/ha/year, is calculated considering applications of mineral and organic fertilisers, minus the amount retained by the plant, as indicated below:

Phosphorus balance = *(P synthetic fertilisers (1) + P livestock effluents (2) + P of seeds (3) – P*

removed by farming (4) – P removed by grazing (5)) / UAA (6)

Where:

(1) amount of phosphorus in mineral fertilisers distributed;

(2) amount of phosphorus contained in livestock effluents applied to land, calculated by specific regional productive system (length of production cycle, final animal weight, feeding of animals etc) and the demographic flux of livestock animals;

(3) amount of phosphorus contained in seeds distributed on land;

(4) amount of phosphorus absorbed by crops (cereal production, industrial crops, oils, protein crops, fruits and vegetables,…);

(5) amount of phosphorus removed by grazing (meadows, fields and pastures)

(6) Utilised Agricultural Area (arable land, permanent grasslands, pastures, permanent crops)

Geographical level of detail: by square km, regional

Calculation is also made of the percentage of variation from 1994 to 2000.

Period: 1994, 1998, 2000.

Source: ELBA model (Environmental Liveliness and Blent Agriculture), University of Bologna.

17. Use of plant protection products

Description: the indicator, expressed in kg/ha of treatable area, is the ratio of the amount of plant protection products (or active ingredients contained in plant protection products) distributed for agricultural use to treatable area.

Figures refer to plant protection products classified by toxicity (highly toxic, toxic, noxious, not classifiable) and their content of active ingredients.

Plant protection products were classified by ISTAT in 1997. Comparisons with previous years are possible, by referring to the following correspondence table:

1997 Classification	*Classification previous to 1997*
Fungicides	Fungicides
Insecticides and acaracides	Insecticides + rodenticides
Herbicides	Weedkillers
Other	Fumigant nematocides +
	Poisoned baits +
	Plant hormones +
	Plant nutrition supplements

ISTAT also reclassified levels of toxicity, so without simplifying it is not possible to make comparisons previous to 1997.

Treatable surface is the sum of lands designated as: arable crops (excluding fallow ground); permanent crops (excluding canebrakes); permanent grasslands (excluding pastures); family market gardens.

Calculation is also made of the percentage variation from 1997 to 2000.

Period: annually from 1997 to 2000.

Source: ISTAT, Statistiche dell'Agricoltura, Statistiche ambientali, Dati congiunturali sui mezzi di produzione (data on-line).

18. Methane emissions (CH_4)

Description: the indicator, expressed in tonnes, gives the amount of methane emitted in the agriculture sector.

In calculating methane emissions, consideration was made of: a) amount emitted during rumination of animals in production (by species and feed breakdown); b) amount emitted per ha of rice paddies (by cultivation technique).

Calculation is also made of the percentage variation from 1994 to 2000.

Period: 1994, 1997, 1998, 2000.

Source: ELBA model (Environmental Liveliness and Blent Agriculture), University of Bologna.

19. Ammonia emissions (NH_3)

Description: the indicator, expressed in tonnes, gives the amount of ammonia (as discharge of nitrogen in the form of ammonia) emitted in the agriculture sector.

Calculations were made using the following scheme:

NH_3 emissions = *Emissions from stalling-sheltering of livestock (1) + Emissions from livestock pasturing (2) + Emissions from storage of livestock effluents (3) + Emissions from spreading of livestock effluents (4) + Emissions from mineral nitrogen fertiliser (5).*

(1) Nitrogen discharge during stalling and/or sheltering of livestock (by species and production system, especially feeding).

(2) Nitrogen discharge from keeping livestock in the open (by species and production system, especially feeding).

(3) Nitrogen discharge from storing livestock effluents (by system used and time of storage).

(4) Nitrogen discharge from spreading livestock effluents (by system employed).

The indicator does not take into account item (5).

Calculation is also made of the percentage variation from 1994 to 2000.

Period: 1994, 1997, 1998, 2000.

Source: ELBA model (Environmental Liveliness and Blent Agriculture), University of Bologna.

20. Carbon dioxide emissions (CO_2)

Description: the indicator, expressed in tonnes, gives the amount of carbon dioxide emitted in the agriculture sector.

In estimating emissions of CO_2 from agricultural diesel fuel combustion, IPCC methodology was used, as described in the three volumes Revised 1996 IPCC “Guidelines for National Greenhouse Gas Inventories”.

The amount of diesel fuel used in agriculture is estimated by using figures that show average diesel fuel consumption (litres of diesel fuel/ha) for crop operations and mechanised farm operations.

The calculation uses the following equation:

t CO_2 = *(((((Litres of diesel fuel per agri-livestock activity/density of diesel fuel)/10^6)* NCV conversion factor (net calorific value)) * factor of carbon emission from diesel fuel) * fraction of oxidised carbon in diesel fuel)*44/12*

Figures on diesel fuel consumption in agriculture are taken from consumption forecast tables in the Decree of the Ministry for Agricultural and Forestry Policies dated 26 February 2002.

Information on crop cultivation is taken from good farming practice guidelines issued by the Emilia Romagna region.

Figures for Utilised Agricultural Area and herd numbers come from the ELBA model.

Period: 1994, 1998.

Source: ELBA model (Environmental Liveliness and Blent Agriculture), University of Bologna.

21. Direct use of energy

Description: the indicator is the ratio of amount of energy consumed in agriculture (expressed in Giga Joules) to Utilised Agricultural Area.

To determine the level of direct energy consumption, examination was made of consumption of fuels and lubricating oils per hectare of Utilised Agricultural Area.

The following processing method was used:

- consideration was made of the quantity and values reported for “lubricants” and “fuels” in the RL0110YU.DBF accounting archives at CONTINEA for 1998-2000;
- then the ratio was figured between quantity and value reported for each individual piece of equipment to calculate the average purchase price;
- fuel prices were then compared to average prices reported on Internet sites for the period of reference (1998-2000) and with prices directly quoted by regional FADN offices;
- Regional FADN offices checked those fuel prices that were below 500 lira per litre and higher than 2,400 lira per litre;
- Regional FADN offices checked those lubricating oil prices that were below 2,400 lira per kg and higher than 50,000 lira per kg (probably special hydraulic oils);
- Once the information about farms surveyed was inserted into the database, the sample of fuels was divided into “gasoline” and “diesel fuel”, and gasoline amounts were multiplied by 5.53 and diesel amounts by 5.15. These two figures (expressed in GJ per Q) are taken from the reference table of input energy units. The fuel sample was divided in the following manner: where the type of fuel was explicit, the entry was left as is; where the type was not specified, but listed generically as “fuel”, the entry “diesel” was used for fuel priced at less than 1.400 lira per litre, and “gasoline” was used otherwise;
- Once the farm figures were checked, the sample amounts of lubricating oils were multiplied by 8.37 (transformation coefficient in GJ per Q);
- Figures were stratified by area.

For the period under consideration, figures for regions of the North-East are not available.

In calculating the indicator, the lira was used as a reference currency, since CONTINEA began gathering economic data in euro beginning with the accounting year 2002, when the euro went into effect. However, the figures in the summary table are converted into euro.

Calculation is also made of the percentage variation from 1998 to 2000.

Period: 1998, 1999, 2000.

Source: FADN, various years.

22. Nitrogen balance

Description: the indicator, expressed in kg/ha of UAA, is the ratio of the difference between inputs and uptakes of nitrogen to Utilised Agricultural Area.

The indicator is elaborated using the ELBA model (Environmental Liveliness and Blent Agriculture), University of Bologna, and calculated using the scheme devised by OECD (Soil Surface Nutrients Balance).

Nitrogen balance = *(amount of nitrogen distributed with mineral fertilisers (1) + nitrogen contained in livestock effluents (2) + nitrogen from rainfall (3) + biological nitrogen fixation (4) + material from*

sowing and planting (5) – nitrogen loss from crops (6) – nitrogen loss from fodder crops (7)/Utilised Agricultural Area (8)

Item (5) of the above scheme is not included in calculations for the indicator.

Calculation is also made of the percentage variation from 1994 to 2000.

Period: 1994, 1997, 1998, 2000.

Source:

(1) Amount of nitrogen distributed, contained in mineral fertilisers: ISTAT.

(2) Amount of nitrogen contained in livestock effluents applied to land, calculated by specific regional production system (length of production cycle, final weight, feed,…) and flux of livestock: ELBA model.

(3) Amount of nitrogen from rainfall (mg of nitrogen/ mm of rainfall): ITA Consortium, Ministry for Agricultural and Forestry Policies and ELBA model.

(4) Amount of nitrogen fixation from micro-organisms in relation to type of crop: National Institute for Plant Nutrition.

(6) Amount of nitrogen taken up by crops (cereals, industrial crops, oil-seed crops, protein crops, fruits and vegetables,…): ISTAT and ELBA model.

(7) Amount of nitrogen taken up by fodder crops (production from herbage, meadows and pastures): ISTAT and ELBA model.

(8) Utilised Agricultural Area (arable land, permanent grasslands and pastures, permanent crops): ISTAT and DG REGIO.

23. Potential leaching of nitrates

Description: the indicator, expressed in kg/ha of UAA, is the ratio of amount of leached nitrogen to UAA.

This indicator, elaborated on a regional basis, was first calculated in 2004; therefore no references exist for previous years.

The amount of nitrates potentially subject to leaching is estimated by the ELBA model (Environmental Liveliness and Blent Agriculture), University of Bologna, based on a balance of inputs and requirements in the whole cultivation cycle:

Nitrogen requirements (kg/ha) = *N_UPTK(kg/ha) – N_AVA (kg/ha)*

Where:

- N_UPTK = nitrogen taken up by planting, calculated based on average production per hectare and uptake capacity of the crop;

- N_AVA = nitrogen available for crops during their growth cycle, and deriving from different sources of organic and inorganic fertilisers = *nitrogen present in the soil at the beginning of the crop cycle (1) + available nitrogen caused by mineralization of the organic matter present in the soil (2) + nitrogen derived from residue of previous plantings(1) (3) + nitrogen derived from residual effects of organic fertilisation in previous years (4).*

Nitrogen contributions are calculated with the exclusion of use in the flower and garden sector; uptakes do not include losses by volatisation.

The amount of potentially leached nitrogen is calculated based on crop (land cover), winter rainfall, farming practices and amount of nitrogen immediately available for crops. In winter, the amount washed out is estimated based on rainfall:

- With rainfall below 150 mm: no loss of available nitrogen;

- With rainfall between 150 and 250 mm: 50% loss of available nitrogen (2);

- With rainfall greater than 250 mm: 100% loss of available nitrogen (2).

[(1)] Not considered in calculation

Period: 2000.

Source: ELBA model (Environmental Liveliness and Blent Agriculture), University of Bologna; land use of 1-sq.km. unit for all agricultural land in Italy, climatic data and soil profile figures: ITA Consortium.

24. Fertiliser use

Description: the indicator, expressed in kg/ha of fertilisable land, is the ratio of the amount of fertilising elements (nitrogen, phosphoric anhydride and potassium oxide) distributed for agricultural use to amount of fertilisable land.

Data for fertilising elements were gathered by ISTAT from producers and importers that distribute these products to farmers, merchants, farm consortiums, co-operatives and associations. These data concern sales of fertilisers, and not their effective use.

Fertilisable land is the sum of areas used for: arable crops (excluding fallow land); permanent crops (excluding canebrakes); permanent grassland (excluding pastures); kitchen gardens.

To make international comparisons, the amount of fertilising elements is also compared to Utilised Agricultural Area, though in this case use per hectare is underestimated.

Calculation is also made of the average annual rate of variation from 1990 to 2000.

Period: 1990, 1993, 1995, 1996, 1997, 1998, 1999, 2000.

Source: ISTAT, Statistiche dell'Agricoltura, various years; Statistiche ambientali, various years; Dati congiunturali sui mezzi di produzione (data on-line).

25. Application of a fertilising plan

Description: the indicator is the percentage share of farms that adopt an annual fertilising plan.

Calculation is also made of the percentage variation from 1998 to 2000.

Period: 1998, 2000.

Source: ISTAT, Struttura e produzioni delle aziende agricole, 1998; Censimento generale dell'agricoltura, 2003.

26. Irrigation systems

Description: the indicator is the percentage share of number of farms that adopt various irrigation systems (sprinkling, flooding, furrowing and lateral seepage, drip, or other) in the total number of irrigated farms.

Calculation is also made of the average annual rate of variation from 1991 to 2000.

Period: 1982, 1990, 2000.

Source: ISTAT, Censimento generale dell'agricoltura, various years.

27. Irrigated land

Description: the indicator is the percentage share of irrigated land in Utilised Agricultural Area.

Calculation is also made of the average annual rate of variation from 1982 to 2000.

Period: 1982, 1990, 2000.

Source: ISTAT, Censimento generale dell'agricoltura, various years.

28. Type of catchment

Description: the indicator gives the number of water catchments used by Reclamation Consortiums registered in the regions of the South and Islands (Abruzzo, Molise, Campania, Basilicata, Puglia, Calabria, Sicily and Sardinia), by different types (canal catchment, catchment from springs, catchment from deep groundwater table, catchment from shallow groundwater table, artificial lake intakes, natural lake intakes, river intakes, abstracting from catch basins, other).

Water catchments are understood as intake constructions on bodies of water, or structures for abstracting water (for irrigation) from bodies of water. Figures regard water catchments managed by public authorities; all private water catchment structures are excluded.

Consideration is made of water catchments that are a) continuative; b) seasonal; c) for emergencies.

Period: 1999.

Source: INEA, POM risorse idriche 1994-1999.

29. Protected areas

Description: the indicator gives the number of protected areas (state and regional) registered in the 3rd updating of the official list of the Ministry for the Environment.

Calculation is also made of area and percentage of national territory occupied by protected areas

Registered in the Ministry for the Environment's official list are all protected areas that have formal institutive provisions, public or private, and which possess features of considerable natural and environmental value protected under specific environmental safeguard measures.

No time series was considered, since periodic updates have resulted in inconsistencies.

Period: 2000.

Source: Ministry for the Environment, Nature Conservation Unit (3rd updating of the official list of Protected Natural Areas).

30. Condition of plant species

Description: the indicator gives the number of extinct and endangered plant species included in the "Red List".

The "Red List" was promoted in 1990 by the Italian Association for the WWF, under the direction of the Ministry for the Environment, and assembled by the Italian Botanical Society. It lists only vascular plants (tracheophytes: pteridophytes, gymnosperms and angiosperms), which can be assessed more easily and thus more reliably. The table distinguishes between endangered species (severely threatened, threatened, at minor risk, vulnerable), extinct species and species extinct in the wild. According to definitions provided by the IUCN (International Union for Conservation of Nature), a species is:

- *extinct* when there is no reasonable doubt that the last individual has died;
- *extinct in the wild* when exhaustive surveys in known and/or expected habitats, at appropriate times and throughout its historic range, have failed to record an individual;
- *critically endangered* when facing an extremely high risk of extinction in the wild in the immediate future:
- *vulnerable* when it is not critical or endangered but is facing a very high risk of extinction in the wild in the medium term future;
- *low risk* when it is not at risk of extinction in the wild in the near future, but some risk factors are clearly evident.

Period: 1995.

Source: Italian Botanical Society – WWF, “Regional Red List of Plants of Italy”, Camerino.

31. Wooded lands affected by fire

Description: the indicator is the percentage share of wooded land affected by fire in total wooded land.

Calculation is also made of the average annual rate of variation from 1985 to 2000.

Period: annually from 1985 to 2000.

Source: ISTAT, Statistiche forestali, various years; Coltivazioni agricole e foreste, various years; Coltivazioni agricole, foreste e caccia, various years.

32. Organic farming

Description: the indicator is the percentage share of Utilised Agricultural Area used for organic farming in total Utilised Agricultural Area.

The number of farms that practise organic farming is also reported.

Calculation is also made of the average annual rate of variation from 1993 to 2000.

Period: annually from 1993 to 2000.

Source: Biobank, from data provided by control bodies, various years; ISTAT, Struttura e produzioni delle aziende agricole, various years; Censimento generale dell'agricoltura, 2003.

33. Agri-environmental measures

Description: the indicator is the percentage share of Utilised Agricultural Area affected by agri-environmental measures (EEC Reg. 2078/92 and measure F, EC Reg. 1257/99) in total Utilised Agricultural Area.

Calculation is also made of the average annual rate of variation from 1994 to 2000.

Period: annually from 1994 to 2000.

Source: AGEA, various years; Struttura e produzioni delle aziende agricole, various years; Censimento generale dell'agricoltura, 2003.

34. Utilised Agricultural Area

Description: the indicator is the percentage share of Utilised Agricultural Area in total national territory.

Calculation is also made of the average annual rate of variation from 1982 to 2000.

Period: 1982, 1990, 2000.

Source: ISTAT, Censimento generale dell'agricoltura, various years.

35. Afforestation index

Description: the indicator is the percentage share of wooded land in total national territory.

For 2000, wooded lands are also divided by type (high forests: coniferous, broadleaved, and mixed coniferous and broadleaved; coppiced: simple, compound; Mediterranean scrub)

Calculation is also made of the average annual rate of variation from 1960 to 2000.

Period: 1960, 1970, 1982, 1990, 2000.

Source: ISTAT, Statistiche forestali, various years; Dati sulla superficie e le utilizzazioni forestali (data on-line); Annuario statistico, 2003.

36. Intensification

Description: the indicator is the percentage share of Utilised Agricultural Area used for intensive cultivation (potatoes, vegetables, grapes, citrus, fruits) in total Utilised Agricultural Area.

Calculation is also made of the average annual rate of variation from 1982 to 2000.

Period: 1982, 1990, 2000.

Source: ISTAT, Censimento generale dell'agricoltura, various years.

37. Concentration

Description: the indicator is the ratio of the number of farms with <5 ha of Utilised Agricultural Area to the number of farms with >50 ha of Utilised Agricultural Area.

Calculation is also made of the average annual rate of variation from 1982 to 2000.

Period: 1982, 1990, 2000.

Source: ISTAT, Censimento generale dell'agricoltura, various years.

38. Man-made and natural elements

Description: the indicator is the percentage share of the extension of natural elements (rows of trees, hedgerows; groves, thickets) and man-made elements (ditches, turning spaces) in total Utilised Agricultural Area.

Period: 1998.

Source: ISTAT, Struttura e produzioni delle aziende agricole – 1998.

APPENDIX 3
EUROPEAN UNION DOCUMENTS

Sustainable agriculture and rural development in European Union policy documents

	References to ecological, economic and social dimensions of sustainable development and rural development
Treaty of Amsterdam Article 33 (Treaty of Rome, Art. 39)	The objectives for the common agricultural policy shall be: to increase **agricultural productivity** by promoting technical progress and by ensuring the rational development of agriculture production and the **optimum utilisation of the factors of production, in particular labour**; thus to ensure a **fair standard of living for the agricultural community**, in particular by increasing the individual earnings of persons engaged in agriculture; to stabilise markets; to assure the **availability of supplies**; to ensure that **supplies** reach consumers **at reasonable prices**.
Agenda 2000 COM(97)2000 final	p. 23 (…) the Union should make a parallel effort to enhance **the economic potential and the environmental value of rural areas** and their **capacity to provide sustainable jobs.** p. 28 (…) **Food safety and food quality** are at least as important [as prices]. (...) Of growing importance in this area too are questions of the **environmental friendless of production methods, and animal welfare considerations**. (...) Ensuring a **fair standard of leaving** for the agricultural community and contributing to the **stability of farm incomes** remain key objectives of the CAP. In this context the questions of differentiation, redistribution of income support among farmers and the preservation of **sustainable farming** are gaining importance, not at least from the point of view of **social cohesion**. **The integration of environmental goals into the CAP** and the development of the **role farmers** can and should play in terms of **management of natural resources and landscape conservation** are another increasingly important objective for the CAP. The **creation of complementary or alternative income and employment opportunities for farmers and their families**, on-farm and off-farm, remains a major aim for the future, as employment possibilities in agriculture itself fall

	away. Rural areas are multi-functional, and farmers should be encouraged to exploit all opportunities for rural entrepreneurs. Last but not least, while recognising the need of rural areas for improving **agricultural competitiveness** and enhancing **economic diversification**, agricultural and rural policies have to contribute to economic cohesion within the Union.
Proposals for Council (EC) regulations concerning the reform of the common agricultural policy COM (1998) 182 final 18 March 1998	Explanatory Memorandum, The European Model of Agriculture: It is worth listing here what the main lines of this model should be: a **competitive agriculture sector** which can gradually face up to the world market without being over-subsidised, since this is becoming less and less acceptable internationally; **production methods which are sound and environmentally friendly**, able to supply **quality products** of the kind the public wants; diverse forms of agriculture, rich in tradition, which are not just output-oriented but seek to **maintain the visual amenity of** our **countryside** as well as vibrant and **active rural communities**, **generating and maintaining employment**;
Council Regulation (EC) n. 1251/1999 of 17 May 1999 establishing a support system for producers of certain arable crops	Preamble: (21) Whereas, in order to benefit from the area payments, producers should set aside a predetermined percentage of their arable area; whereas **the land set aside** should **be cared for so as to meet certain minimum environmental standards**; (…)
Council Regulation (EC) No 1254/1999 of 17 May 1999 on the common organisation of the market in beef and veal	Preamble: (14) Whereas, to strenghten **incentives to extensify production** with a view to **improving their effectiveness in relation to environmental objectives**, an additional amount should be granted to producers who comply with severe and genuine stocking density requirements; (…) (Additional payments) art. 15, (...) 3. The specific stocking density requirements shall be established: - (…) - taking account of, in particular, the **environmental impact** of the type of production concerned, the

	environmental sensitivity of the land used for rearing cattle and the measures which have been implemented with a view to stabilise or improve the environmental situation of this land.
Council Regulation (EC) No 1259/1999 of 17 May 1999 establishing common rules for direct support schemes under the Common Agricultural Policy	Preamble: (3) Whereas, with a view to better integrating the environment into the common market organisations, **Member States should apply appropriate environmental measures in relation to agricultural land and agricultural production subject to direct payments**; whereas Member States should decide on the consequences in the case of environmental requirements not being observed; whereas **Member States should be enabled to reduce or even cancel benefits accruing from support schemes where such environmental requirements are not respected**; whereas such measures should be taken by Member States notwithstanding the possibility of granting aid in return for optional agrienvironmental commitments; (4) Whereas, in order **to stabilise the employment situation in agriculture** and **to take into account the overall prosperity of holdings** and Community support to those holdings and thus **to contribute to a fair standard of living for the agricultural community**, including all persons engaged in agriculture, Member States should be authorised to reduce direct payments to farmers in cases (…); (7) Whereas the support schemes under the common agricultural policy provide for direct income support in particular with a view to **ensuring a fair standard of living for the agricultural community**; whereas this objective is closely related to the **maintenance of rural areas**; (…)
Council strategy on the environmental integration and sustainable development in the common agricultural policy established by the Agricultural Council 15 November 1999	(8) The Council notes the **multifunctional role of agriculture from production of food and renewable raw materials to the stewardship of rural landscapes and the protection of the environment. Agriculture's contribution to the viability of rural areas** is also indisputable (…). (9) **Integration of environmental protection and sustainability requirements into sectoral policies** is a key element for successful **socio-economic development** as well as for improvement and implementation of **environmental policy**. (…) (11) **Sustainable agriculture** calls for **natural resources** to be managed in a way that ensures **benefits** are also available **in the future**. It takes into account the preservation of the **overall balance** and **value of the natural capital stock** and the need for **agriculture** to be **competitive**. (13) Complemented by the **contribution of agriculture to the viability of rural areas** these objectives [the objectives

of the CAP included in art. 33 of the Treaty of Amsterdam] comprise **important economic and social aspects** of the sustainability approach. Agriculture plays an important role in **contributing to the maintenance of employment in rural areas** and in the whole food and non-food production chain.

(15) Integration of the environment into the CAP starts by recognising that a **reference level of good agricultural practices** which is dependent on local conditions should be respected in all agricultural areas of the EU. The general principle is that where farmers provide services to the environment beyond the reference level of good agricultural practices, these should be adequately remunerated. Certain methods of **agricultural production**, for example organic farming, integrated production and traditional low output farming and typical local productions, provide a combination of positive **environmental, social and economic effects**.

(36) As **elements of sustainable agriculture ethical production methods and animal welfare** should be promoted.

(46) It is necessary to deepen and develop further the **integrated rural policy** by taking into account the **social and economic dimension**, encouraging co-operation and dialogue between actors (environmental authorities, non-governmental organisations, farmers organisations and public actors) in the pursuit of sustainability and through national measures. The rural development policy – as the second pillar of the CAP – seeks to establish a coherent and sustainable framework for the future of rural areas aiming at restoring and enhancing **competitiveness and therefore contributing** to the **maintenance of employment**.

(87) (…) It is important to broaden the domain of **indicators** to include multifunctionality of agriculture and **sustainable development**.

(91) The Council agrees that:

> **Sustainable agriculture** ensures that agriculturés natural base remains productive and **agricultural production** can be **competitive in the future** and that farming works **to promote positive environmental impact**.
>
> (…)
>
> **Agriculture** is multifunctional and clearly has **effects on the environment** and **the rural landscape**. Furthermore it has a **fundamental role to play in the viability of rural areas**.
>
> **Good agricultural practices** should be further developed and respected in all areas of the EU.

	Agriculture plays an important role in **contributing to the maintenance of employment in rural areas** and in the whole food and non-food production chain. (…) Agriculture should respond to increasing consumer concern about food safety as well as **food and environment quality** (…). **Economical, environmental, social and cultural services provided by farmers** must be recognised; for these services farmers should be adequately remunerated. In particular, when farmers provide services for the benefit of the environment beyond the reference level of good agricultural practices and environmental legislation, they should be adequately compensated for example through agri-environmental measures being implemented on a voluntary basis. (…)
Communication from the Commission Directions towards sustainable agriculture COM/99/0022 final	(Introduction) The beneficial use of land and natural resources for agricultural production has also to be balanced with **societys values relating to the protection of the environment and cultural heritage**. (Environmental elements of the CAP reform under Agenda 2000) Policies are required to develop EU agriculture on a sustainable path, ensuring an **environmentally sound, economically viable, and socially acceptable European model of agriculture**. (Rural development measures) The tourist potential based on good environmental conditions of **rural areas** enables the **diversification of economic activities** to be considered; this requires a sustainable and integrated approach in order to meet the quality requirements of tourists, to improve the situations of local businesses and communities and **to preserve the natural (landscape and biodiversity)** and **cultural (architecture, handicrafts, traditions) heritage**. (Compensatory allowances in less-favoured areas) The main objectives remain broadly unchanged, namely to assure continued farming in the less-favoured areas, **to contribute to the maintenance of a viable rural community, to preserve the landscape** and to promote the continuation of sustainable farming in areas where it is necessary for the protection of the countryside.

Communication from the Commission Indicators for the Integration of Environmental Concerns into the Common Agricultural Policy COM/00/0020 final	At a first level, "sustainable agriculture" **involves managing natural resources in a way which ensures that they are available in the future**. This narrow definition of sustainability in many cases reflects **the economic self-interest of farmers**. A broader understanding of sustainability extends, however, to a larger set of **features linked to land and land use such as the protection of landscapes, habitats, and biodiversity,** and **to objectives such as the quality of drinking water and air**. In this broader perspective, the use of land and natural resources for agricultural production must take account of the **protection of the environmental and cultural heritage**. Finally, sustainability needs also to reflect societ_s concerns as regards **the social function of agriculture**, **the** s**maintenance of the viability of rural communities** and **a balanced pattern of development**. Sustainable agriculture therefore needs to reflect **productive, environmental and social functions**.
Communication from the Commission A Sustainable Europe for a BetterWorld: A European Union Strategy for Sustainable Development (Commission's proposal to the Gothenburg European Council) COM(2001)264 final	Just over one year ago at Lisbon, the European Council set a new strategic goal for the Union: "to become the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion". The Stockholm European Council then decided that the EU sustainable development strategy should complete and build on this political commitment by including an environmental dimension. This recognises that **in the long term, economic growth, social cohesion and environmental protection must go hand in hand**. Sustainable development offers the European Union **a positive long-term vision** of **a society** that is **more prosperous and more just**, and which promises **a cleaner, safer, healthier environment** (…). **Clear, stable, long-term objectives** will shape expectations and create the conditions in which businesses have the confidence to invest in innovative solutions, and to create new, high-quality jobs. **Action must be taken by all and at all levels**: many of the changes needed to secure sustainable development can only successfully be undertaken at EU level. **Careful assessment of the full effects** of a policy proposal must include estimates of its **economic, environmental and social impacts** inside and outside the EU. This should include, where relevant, **the effects on gender equality and equal opportunities**.

	Our continued long-term prosperity depends critically on advances in **knowledge and technological progress**. The **education** system also has a **vital role** to play in promoting better understanding of the aim of sustainable development, fostering a sense of individual and collective responsibility, and thereby encouraging changes in behaviour. The main challenges to sustainable development identified above cut across several policy areas. Accordingly, **a comprehensive, cross-sectoral approach is needed** to address these challenges.
Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions Towards a Thematic Strategy for Soil Protection COM(2002) 179 final	**Soil** (…) performs a number of **key environmental, social and economic functions** vital for life. **Soil** is a vital resource increasingly under pressure. **For sustainable development, it needs to be protected**. Therefore, soil protection policies need to have a **special focus on sustainable use and management of agricultural soils**, with a view to safeguarding the fertility and agronomic value of agricultural land.
Communication from the Commission to the Council, the European Parliament and the Economic and Social Committee Towards a thematic strategy on the sustainable use of pesticides COM(2002) 349 final	This [to be conform with the principles of the 6EAP] requires, among others, that: [the soil strategy] contributes **to achieving a de-coupling between environmental pressures and economic growth**; [the soil strategy] contributes to the **development of a plant protection practise that fits into the concept of sustainable agriculture including social and economic dimensions**.
Communication from the Commission to the Council and the European Parliament 2003 Environment Policy Review Consolidating the environmental pillar of sustainable development COM(2003) 745 final	2. A new political context (…) the concept of sustainable development (…) need to place **the three dimensions** [economic, social and environmental] **on an equal footing**. However, our long-term economic and social prospects very much depend on our ability to consider **the environment as a key component of economic and social policy.** Addressing in a balanced manner **potential trade-offs between economic and environmental objectives** can **bring forth "winwin" solutions and enhance sustainable development**. 4. A renewed approach to environmental policy (…) A measure of success of a strategy is how effectively it tackles the problem of **resolving trade-offs between the different pillars** [environmental, economic and social] **of sustainable development**. To progress on the way towards sustainable development, **potential synergies between environment and the other two dimensions– economic and social- must be fully exploited.**

	(…), **information** plays a number of key roles **in the environmental policy process**. The first is as a **driver** for environmental policy. By monitoring the driving forces, the pressures and changes in the state of the environment, **problems can be identified as they arise**. 6. International dimension (…) In implementing the strategy [of environmental integration],, particular attention is attached to two objectives: **promoting synergies between development and environment objectives** (…). 7. Conclusions All necessary steps will be taken to achieve **a high level of economic growth and social cohesion** in the Union while **ensuring decoupling from environmental degradation.**

Source: adapted and broadened from European Commission, (2001), *A framework for Indicators for the Economic and Social Dimensions of Sustainable Agriculture and Rural Development,* Brussels.

APPENDIX 4
USEFUL WEBSITES

International Institutions and Organisations

European Commission Agriculture	http://europa.eu.int/comm/agriculture/info.htm
European Commission Environment	http://europa.eu.int/comm/dgs/environment/index_it.htm
European Commission Eurostat	http://europa.eu.int/comm/eurostat/
European Environment Agency (EEA)	http://www.eea.eu.int/
Institute for Environment and Sustainability (IES) European Commission Joint Research Centre	http://ies.jrc.cec.eu.int/
Organisation for Economic Co-operation and Development (OECD)	http://www.oecd.org
UN Commission on Sustainable Development (UN CSD)	http://www.un.org/esa/sustdev/csd.htm
UN Convention on Biological Diversity (UN CBD)	http://www.biodiv.org
UN Convention to Combat Desertification (UN CCD)	http://www.unccd.int
UN Framework Convention on Climate Change (UN FCCC)	http://www.unfccc.de
UN Educational, Scientific and Cultural Organizzation (UN ESCO)	http://www.unesco.org
UN Environment Programme (UN EP)	http://www.unep.org
UN EP World Conservation Monitoring Centre	http://www.unep-wcmc.org
UN Food and Agriculture Organisation (FAO)	http://www.fao.org
UN Food and Agriculture Organisation (FAO) Sustainable Development Department	http://www.fao.org/waicent/faoinfo/sustdev/
World Bank	http://www.worldbank.org
World Bank - Rural Development and Agriculture	http://wbln0018.worldbank.org/essd/essd.nsf/rural+development/portal
World Bank - Environment	http://www.worldbank.org/environment/
World Bank - Land Quality Indicators	http://www-esd.worldbank.org/lqi/

National Agencies and Ministries

Department for Environment Food and Rural Affairs - UK	http://www.defra.gov.uk/
Sustainable Development Commission - UK	http://www.sd-commission.gov.uk/
Natural Resource Conservation Service (United States Department of Agriculture - USA)	http://www.nrcs.usda.gov/

United States Environmental Protection Agency – USA	http://www.epa.gov/
Agriculture and Agri-food Canada Ministry of Agriculture Agri-Environmental Indicators Report	http://www.agr.gc.ca/policy/environment/pubs_aei_e.phtml

Non-Governmental Organisations

IISD/Consultative Group on Sustainable Development Indicators International Institute for Sustainable Development	http://www.iisd.org/cgsdi/indices.htm
IISD/Consultative Group on Sustainable Development Indicators The Dashboard of Sustainability Criterion for aggregating sustainability indicators	http://www.iisd.org/cgsdi/dashboard.htm
European Centre for Nature Conservation (ECNC) Research centre for investigating issues of scientific and political relevance, especially key aspects (economic, social and ecological) that can influence European policy for nature conservation (cfr. for example the report on agri-environmental indicators). It also provides support to international organisations and political initiatives.	http://www.ecnc.nl/
World Conservation Union (IUCN) Worldwide association whose objective is the conservation of nature and the equitable and environmentally sustainable use of natural resources.	http://www.iucn.org
World Wide Fund for Nature (WWF) Worldwide organisation that works locally to arrest the degradation of the natural world.	http://www.panda.org
International Society for Ecological Economics (ISEE) Company dedicated to integration and interdisciplinary dialog for the development of a sustainable world.	http://www.ecologicaleconomics.org
International Soil Reference and Information Centre (ISRIC) Foundation for documentation, information and research about soils, to provide a better understanding about soils and to promote sustainable use of the land.	http://www.isric.nl
Resources for the Future (RFF) Social science research institute (focusing on environment, energy and natural resources issues) primarily geared toward information on policymaking..	http://www.rff.org
Wetlands International Association dedicated to wetland conservation and sustainable management.	http://www.wetlands.org/

BirdLife International Global alliance of conservation organisations working together for the world's birds and people.	http://www.birdlife.net/
Biodiversity Conservation Information System A consortium of ten international organisations and programs of IUCN to support members and policymakers for conservation and sustainable use of natural resources.	http://www.biodiversity.org
World Resource Institute Non-governmental research and policy organization that creates solutions to protect the Earth and improve people's lives.	http://www.wri.org
Worldwatch Institute Independent research organization that devotes particular attention to the interactions between people, nature and economies.	http://www.worldwatch.org
National Councils for Sustainable Development National bodies for citizen participation in sustainable development.	http://www.ncsdnetwork.org/background.htm
International Federation of Organic Agriculture Movements (IFOAM) Organisation for the adoption of agricultural systems based on the principles of organic farming.	http://www.ifoam.org

Finito di stampare nel mese di settembre 2004
dalla Stilgrafica s.r.l. - Roma