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Institute for Environmental
Protection and Research

KEY TOPICS

Italian Environmental Data Yearbook

2008

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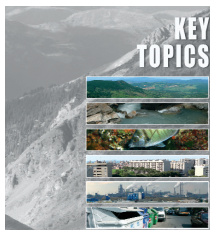


MINISTERO DELL'AMBIENTE
E DELLA TUTELA DEL TERRITORIO E DEL MARE



G8
SIRACUSA
22-23-24 Aprile 2009

ENVIRONMENTAL PROTECTION AGENCIES OF THE REGIONS
AND AUTONOMOUS PROVINCES



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Law 133/2008, which converted, following modification, Legislative Decree no. 112 of 25 June 2008, established the ISPRA – Institute for Environmental Protection and Research. The ISPRA carries out the functions that were the responsibility of the Environmental Protection and Technical Services Agency (formerly APAT), of the National Institute for Wild Fauna (formerly INFS) and of the Central Institute for Scientific and Technological Research Applied to the Sea (formerly ICRAM). The present publication refers to activities carried out during a period preceding the merger of the three institutions, meaning that it still contains references and titles the three institutes no longer in existence.

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Environmental Statistics and Yearbook Project Service
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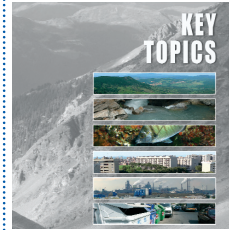
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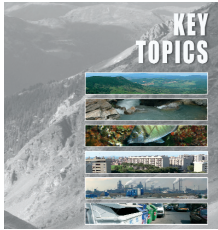
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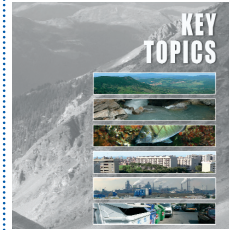


*Dissolui quo quaeque supremo tempore possint,
materies ut subpeditet rebus reparandis.¹*

*Titi Lucreti Cari – De rerum natura
(Liber I, 546-547)*

¹ In fact, we see that anything deteriorates more quickly than it renews itself





Foreword

In the field of the environment, as in other sectors, information represents an indispensable tool when it comes to planning actions and evaluating their outcomes. It also plays a critical role in keeping the general public constantly informed on issues of environment protection.

The term *information* can be used in two different ways: the first implies *knowledge*, meaning the outcome of all those activities designed to identify and assess causes and effects of environmental factors and trends; the second is *communication*, or the dissemination of this knowledge to all potential users and recipients.

This dual task has been widely exercised in all the different guidelines, planning documents and legislative acts drafted over time in various venues and at different levels of government.

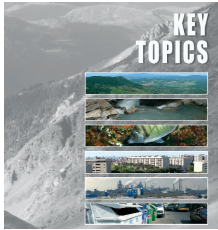
Due to these acts, and to the Aarhus Convention in particular, environmental data and information has gradually been made available to all potential users. Until just a few years ago, those who possessed such data could decide - and quite often legitimately - not to distribute them. But today, legislators ensure that such data receive the widest possible visibility and distribution.

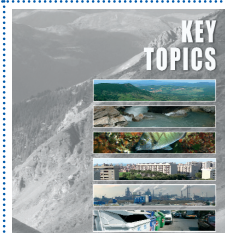
One of the most important tasks of ISPRA is to do just that, by collecting, processing and fully disclosing and distributing information on the state of the environment.

The completeness and reliability of the information in ISPRA Yearbook make it single out among other environmental reference sources, allowing both environmental professionals and private citizens to benefit from it.

To all those who have contributed to the publication, I offer my sincerest thanks for a well done job.

Prefect Vincenzo Grimaldi
Commissioner of the ISPRA





Introduction to the Environmental Data Yearbook

The Environmental Data Yearbook, the most extensive and complete collection of official environmental statistics published in Italy, is the result of the former APAT's years of experience in the field of environmental reporting. With the creation of the ISPRA, the internal potential for improving and further expanding the information base was increased by the contributions of the former ICRAM and INFS institutes. Though the full result of these additions will not be visible until future editions of the Yearbook, starting this year it has already been possible to include new contributions supplied by the INFS on the topic of Biodiversity.

Apart the internal contributions, it should once again be stressed that the activities of collecting and disseminating environmental information carried out by the Institute in synergy with the Environmental Protection Agencies of the Regions and the Autonomous Provinces constitute an essential element in the formulation of the work. Numerous technical-scientific bodies, the so-called Main Reference Institutions, have also provided the Institute with support throughout the process of preparing the document, and especially during the phases involving the validation of the data and the processing of the information.

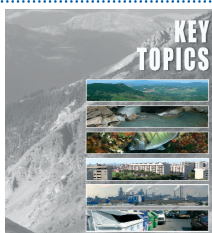
This edition marks the start of a major revision of the core-set of indicators underlying all the publications tied to the Environmental Data Yearbook. The key elements of this core-set date back to approximately eight years ago. Over time, and on account of subsequent modifications, its make-up has changed. Many indicators have been added, and others have been modified or eliminated. It thus seemed best to subject the current core-set to an attentive control, in order to make the most of its strong points while remedying any weaknesses.

To this end, an attempt was made, first of all, to assess the validity of each of the core-set indicators with regard to the objectives stipulated under national and extra-national laws and regulations, as well as to national and international reporting obligations and guidelines.

In the case of each indicator, evaluations were also carried out to determine: its capacity to represent to the phenomenon being investigated; the availability of the necessary data on the population involved; the scientific relevance and solidity of the indicator.

In the case of new requirements generated by national and extra-national laws and regulations, new indicators were prepared, and in some instances inserted, when necessary.

New types of indicators were also included (i.e. indicators of efficiency, of sustainability etc.), while a number of others were reassigned to more pertinent thematic areas.



This process, initiated with the current year, is still underway. Hopefully it can be included in time for the next edition of the Yearbook.

The *full version of the Yearbook* provides an extremely detailed treatment of the environmental topics addressed. It contains all the indicator charts populated during 2008, organised by production sectors, environmental conditions and responses.

As a result of the process of revision referred to above, the annual edition presents a variety of new features.

For the first time, a chapter has been included with a number of indicators of the socio-economic context, such as population, territorial surface area, UAA, number of companies and capacity of infrastructures, so that readers may place whatever environmental information interests them in its pertinent context.

Under the section *Production Processes*, the chapters *Agriculture*, *Energy* and *Transport* have been rationalised, thanks in part to the revision effort involving the core-set of indicators.

The chapters found under the section *Environmental Conditions* have also undergone major modifications. In particular, three indicators previously placed under the heading *Contaminated Sites* were judged to be more appropriate for the chapter *Anthropogenic Risk*.

The section on *Safeguards and Prevention* presents a number of new developments: a chapter on *Planning Instruments* has been included, and the chapter *Environment and Health* has been reformulated and improved.

As for the chapter *Monitoring and Control*, the delicate nature of the subject matter studied made it necessary to organise a working group specifically assigned to draw up adequate indicators for representing the situation in question.

Finally, the chapter *Environmental Assessment and Certification* contains indicators regarding both voluntary instruments (EMAS, Ecolabel) and those called for under current laws and regulations (EIA/SEA).

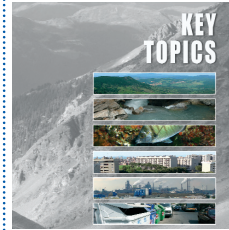
The full version of the 2008 edition is produced in electronic format (PDF) and available on CD-ROM or at the site www.apat.gov.it e <http://annuario.apat.it>.

The basic information is provided in three further products, in addition to the full version of the Yearbook:

Key Topics – A version containing supplementary information on priority environmental issues that have been the subject of specific initiatives of prevention and reclamation;

Vademecum – An extremely abbreviated version (*pocket*) of the assessments contained in the preceding volume;

Database – An instrument designed for the telematic consultation of the indicator fact-sheets and the production of reports.



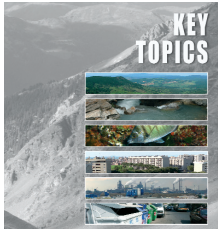
In the volume *Key Topics*, the information base of the Yearbook is used to evaluate a number of situations typical of the environmental topics that currently constitute the priority concerns of environmental policy. The areas taken under consideration were chosen in accordance with the topics addressed by the EU's 6th Environmental Action Plan, though, as compared to the Plan, it was decided to place greater emphasis on the aspects of *Soil and Land* and *Coastal Areas*, given the importance of these topics as part of the International Year of the Planet Earth being organised for 2008 by the United Nations.

The same topics are addressed in extremely abbreviated form in the *Vademecum*, so as to provide, through a selection of pieces of information that are few in number but extremely significant, an immediate overview of the situations and development described.

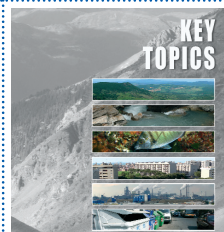
The *Database* of the Yearbook, together with the *Full Version*, make possible in-depth examination of the topics using the database collected.

The database provided by the ISPRA has thus led to the creation of a series of very different information products, with the end goal being to put environmental information at the disposal of a wide range of users: from public decision-makers to researchers, from stakeholders to private citizens. I hold that the success of policies of sustainability depends, first and foremost, on all citizens possessing an awareness of environmental issues. The efforts of the ISPRA to distribute such information, therefore, represent an important contribution to the growth of that awareness. I shall see to it that the Institute is always provided with the resources, both intellectual and material, need to continue carrying out this important function.

Dr. Roberto CARACCILO
Director of Department
State of the Environment and Environmental Metrology



Contributors and Thanks



General considerations

Among the most important of the institutional tasks that ISPRA inherited from the APAT are the management of environmental information and reporting.

To this end, the Institute distributes and promotes the dissemination of data on the state of the environment through thematic and inter-thematic reports, such as the Environmental Data Yearbook, now in its seventh edition.

Compared to the other publications, the Yearbook, given the thoroughness of the treatment of the environmental topics, stands as the best example of the final outcome of the complex synergies involving almost all the Institute's structures in the different disciplines. As already mentioned, starting from this edition, and in the wake of the merger of the former ICRAM and INFS institutes into the ISPRA, the contributions of the former APAT units to the production of the work have been supplemented, though still in an embryonic state, by those of the new units. To an even greater extent than in years past, the mass of information generated, together with the complexity of the analyses required to prepare this edition of the Yearbook, called for the efforts of a noteworthy number of experts on the different topics, together with reporting analysts.

In citing the main contributions to the publication, special mention must go to the following departments: *State of the Environment and Environmental Metrology*, *Marine and Inland Waters Protection*; *Land Resources and Soil Protection*; *Nature Protection*; *Nuclear, Technological and Industrial Risk*; *Library, Documentation and Information*; as well as to the Inter-Departmental Services: *Environmental Emergencies*, *Environmental Information*; *Guidance, Coordination and Control of Inspection Activities* and *Environmental Certification*, carried out in the past by the former APAT, INFS and ICRAM institutes.

Equally important were the contributions of the ARPA/APPA agencies, plus the numerous technical-scientific bodies.

The planning and coordination of the overall production of the work are handled by the State of the Environment and Environmental Metrology Department, through the Environmental Statistics and Yearbook Project Service, formerly parts of the APAT.

Specific contributions to the present document

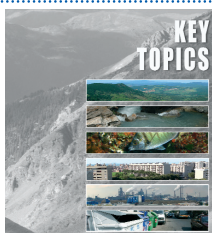
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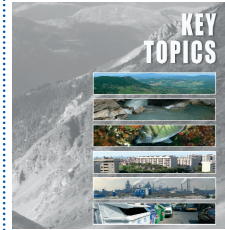
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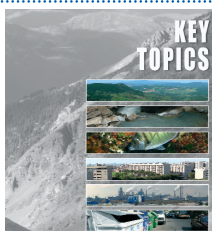
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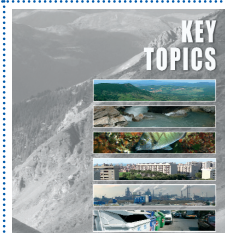
Annex – Environmental Yearbook Indicators Database

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Editing

The phases of the editing of the Yearbook product were handled by a working group coordinated by Mariaconcetta GIUNTA and consisting of: Giovanni FINOCCHIARO (processing and statistical validation of the data), Cristina FRIZZA (processing and statistical validation of the data), Alessandra GALOSI (processing and statistical validation of the data), Silvia IACCARINO (coordination of the fact-sheet and technical revision), Alessandra MUCCI (revision and editing of texts), Alessia PENNESI (revision and editing of texts), Matteo SALOMONE (processing and statistical validation of data), Luca SEGAZZI (technical revision and processing and statistical validation of data), Paola SESTILI (contact for the processing and statistical validation of data). The Database of the Yearbook Indicators was managed by Raffaele MORELLI.

The Group has also handled the preparation of specific techniques, together with the related guidelines, for compilation of the indicator fact-sheet and the Yearbook Indica-

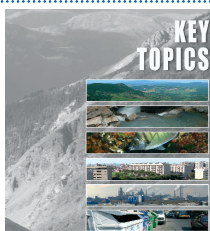


tors Database, as well as the integration of the contents of the work, the processing and statistical validation of the data published and the overall technical review of both the information contents and the methodological/editing techniques used on those contents.

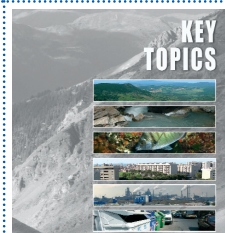
Information Contents – Reference Units of the former APAT

The work involved in the preparation of the information contents of the “Environmental Data Yearbook” was carried out by a Task Force coordinated by Mariaconcetta GIUNTA. In the interests of updating the indicators found in the Yearbook Indicators Database for each environmental topic, the following contacts were identified within the Institute:

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|-----------------------------|--|---|--------------------------------------|
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| ENERGY | Domenico GAUDIOSO | AMB-MPA | Alessandra GALOSI |
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| WASTE | Rosanna LARAIA assisted by Andrea LANZ | AMB-RIF | Cristina FRIZZA |



| Environmental Topics | Topic Coordinator | Department Service/Sector | Statistical Coordinator |
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| PROMOTION AND DISSEMINATION OF ENVIRONMENTAL CULTURE | Adolfo PIROZZI Rita CALICCHIA | BIB-FOR AMB-RAS | Matteo SALOMONE |
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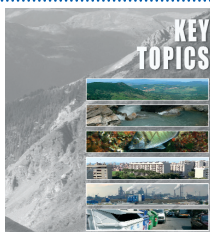
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|------------------------------------|--------------------------------|----------------------------------|--------------------------------|
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| | Eutizio VITTORI (Natural Risk) | SUO-RIS | |
| | Claudio PICCINI (Biosphere) | NAT-BIO | |
| ENVIRONMENT AND HEALTH | Luciana SINISI | AMB-VAL | Cristina FRIZZA |

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| Graphics/Photography | Franco IOZZOLI Paolo ORLANDI | DIR-COM DIR | Matteo SALOMONE |

The full meanings of the symbols for the departments, inter-departmental services, services and sectors are spelled out below:

| Departments/Inter-Departmental Services of the former APAT | SYMBOL |
|--|---------------|
| Commissioner's Office | DIR |
| Communications Service | DIR/COM |
| Inter-Departmental Service for Guidance, Coordination and Control of Inspection Activities | ISP |
| Inter-Departmental Service for Environmental Emergencies | EME |
| Inter-Departmental Service for Environmental Certification | CER |
| Department for Land Resources and Soil Protection | SUO/DIR |
| Service of Background Investigations, Basin Plans and Data Collection | SUO/IST |
| Natural Risks Service | SUO/RIS |
| Department for Marine and Inland Waters Protection | ACQ/DIR |
| Coastal Protection Service | ACQ/COS |
| Data Collection and Management Service | ACQ/DAT |
| Service for the Monitoring and Hydrology of Inland Waters | ACQ/MON |
| Service for the Lagoon of Venice | ACQ/VEN |
| Department for the State of Environment and Environmental Metrology | AMB/DIR |
| Special Yearbook Project and Environmental Statistics Service | AMB/ASA |



| Departments/Inter-Departmental Services of the former APAT | SYMBOL |
|---|---------------|
| Special Environmental Observatory Project | AMB/OAM |
| Service for the Monitoring and Prevention of Atmospheric Impact | AMB/MPA |
| Physical Agents Service | AMB/AGF |
| Environmental Metrology Service | AMB/LAB |
| Environmental Assessment Service | AMB/VAL |
| Environmental Reporting and Instruments of Sustainability Service | AMB/RAS |
| Waste Service | AMB/RIF |
| Department of Nuclear, Technological and Industrial Risk | RIS/DIR |
| Radiation Protection Service | RIS/RDP |
| Nuclear Technologies Service | RIS-NUC |
| Nuclear Activities Control Service | RIS-CON |
| Industrial Risk Service | RIS/IND |
| Radiometric Measurement Service | RIS/LAB |
| Department of the Protection of Nature | NAT/DIR |
| Service for the Sustainable Use of Natural Resources | NAT/SOS |
| Service for the Protection of Biodiversity | NAT/BIO |
| Department of Library, Documentation and Information Activities | BIB/DIR |
| Environmental Education and Training Service | BIB/FOR |
| Library Service | BIB/DOC |
| Web Portal Service | BIB/WEB |

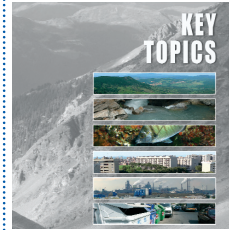
Authors of information contents

A detailed listing of specific contributors (authors and collaborators for the specific topics) is included at the start of each chapter of the full version in the electronic format.

Contributions of the Environmental Agency System

Initially, the contribution of the System involved the formulation of methodologies and the collection of data; later, it took the form of invaluable refereeing activities that made it possible to detect and, when necessary, resolve discrepancies inevitably produced by such an elaborately structured, complex process of information management.

The role of liaison between the ISPRA and the individual ARPAs was carried out by: Giovanni AGNESOD (ARPA Aosta Valley), Rossella AZZONI (ARPA Lombardy), Fabio BADALAMENTI (ARPA Sicily), Milena BRANDINELLI (ARPA Marche), Chiara DEFRANCESCO (ARPA Trento), Luciana DI CROCE (ARPA Abruzzo), Alessandro Di GIOSA (ARPA Lazio), Giuseppe DI NUZZO (ARPA Basilicata), Ferruccio FORLATI (ARPA Piedmont), Marco GANI (ARPA Friuli Venezia Giulia), Donatella GRIMALDI (ARPA Liguria), Armando LOMBARDI (ARPA Abruzzo), Roberto MALLEGGNI (ARPA Emilia Romagna), Luca MENINI (ARPA Veneto), Luigi MINACH (ARPA Bolzano), Pina NAPPI (ARPA Piedmont), Paolo Michele RICCI (ARPA Molise), Stefano ROSSI (ARPA Tuscany), Ferdinando SCALA (ARPA Campania), Vincenzo SORRENTI (ARPA Calabria), Stefano SPAGNOLO (ARPA Apulia), Paolo STRANIERI (ARPA Umbria), Carla TESTA (ARPA Sardinia).



Other contributions from the ISPRA Technical Units

Other specific technical contributions were made by the Units of the former APAT, including:

- on topics regarding the *Atmosphere, Waste, Noise, Non-Ionising Radiation, Environment and Health, Monitoring (Metrology), Environmental Impact Assessment, Dissemination of Environmental Information*, and the production sectors of *Energy, Industry, Tourism and Transport*, from the State of the Environment and Environmental Metrology Department;
 - on topics regarding *Water Resources and Coastal Defence*, from the Marine and Inland Waters Department;
 - on topics regarding the *Soil and Natural Risk*, the Land Resources and Soil Protection Department;
 - on topics involving the *Biosphere* and the *Agriculture* production sector, from the Nature Protection Department;
 - on topics regarding *Ionising Radiation and Anthropogenic Risk*, from the Nuclear, Technological and Industrial Risk Department;
 - on topics regarding the *Promotion and Dissemination of Environmental Culture*, from the Library, Documentation and Information Activities Department;
 - on the topic of *Control*, from the Inter-Departmental Service for Guidance, Coordination and Control of Inspections Activities;
 - on considerations regarding the *Environmental Quality of Organisations, Businesses and Products*, from the Inter-Departmental Service for Environmental Certification.
- Specific *technical contributions* were also provided by the for Institute for Wild Fauna, especially with regard to topics involving the *Biosphere*.

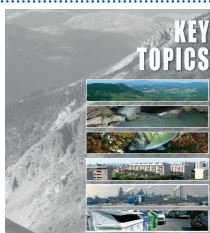
Specific contributions *on considerations of methodology and liaison* were supplied by:

- SISTAN interface, through the Statistics Office of the former APAT: Mariacconcetta GIUNTA;
- coordination of the *EIONET* network (formerly handled by the APAT): Claudio MARICCHIOLO, as the *National Focal Point* for Italy;
- chapter on the *Promotion and Dissemination of Environmental Culture*: Inter-Agency Workgroup for Education Geared towards Sustainability (EOS), the network of libraries and contacts for environmental instruction of the Agency System.

Other contributions by Units of the former APAT

The following contributions were made on operating considerations:

- procedural and administrative considerations: Vincenzo PEZZILLO, Elisabetta GIOVANNINI;
- administrative considerations: the Department of General Services and Personnel Management and the Inter-Departmental Service for the Administration and Planning of Activities. With regard to the activities involved in carrying out tenders, the Tender and Contracting Sector;
- the functional support was overseen by Elisabetta GIOVANNINI.



Contributions by Subjects outside of the Agency System

Numerous contributions from central and local government bodies have also been drawn on, as well as from technical-scientific structures and individual experts in different sectors.

Of the government bodies, specific mention should be made of: the departments of the Ministry of the Environment, Land and Sea, the Ministry of Economic Development, the Ministry of Cultural Resources and Activities, the Ministry of Infrastructures and Transportation, the Ministry of Agricultural, Food and Forestry Policies, the Ministry of Labour, Health and Social Policies, the Carabinieri Police Command for the Protection of the Environment, the Italian National Forestry Corps, the Manager of the National Transmission Network, the Marine Environmental Unit of the Harbourmasters' Corps, the National Fire-Fighters' Corps, the Regional and Provincial Waste Observatories, the Commissioners for the Waste Emergencies in the Regions of Campania, Calabria, Apulia and Sicily, the regional, provincial and municipal governments, the PMP and local government bodies. Of the technical-scientific authorities and organisations, both public and private, the following should be acknowledged: the ISTAT, the ISS, the basin authorities, the magistrates of bodies of water, the CNR, the ACI, the ENEA, the Italian Glaciological Committee, the Italian Meteorological Society, the ENEL, the European Soil Bureau of the Common Research Centre of the European Commission in Ispra (VA), EUROSTAT, Agecontrol S.p.A., Biobank, the National Register of the Organisations EMAS, ISTIL, ODYSSEE, TELEATLAS, TERNA and Tethys.

Referees

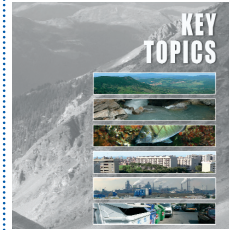
As was done with previous editions, in addition to the numerous contributions received from subjects (individual experts and organisations) outside of the Agency System during the phases involving the formulation and production of the Yearbook, it was held best to request an additional and independent assessment of the final product from experts on the individual topics addressed in the publication.

It was not always possible to utilise all or a part of these contributions. In certain cases, the key factor was a lack of time. Other contributions that could not immediately be put to use regard proposed additions to the Indicators Database. In such cases, the proposals were not included because the data needed to populate the indicators were lacking.

We shall be sure, however, to return to these proposals in subsequent editions of the Yearbook.

The following individuals were consulted and offered observations and proposals for additions:

Renzo BARBERIS (ARPA Piedmont), Gianfranco BOLOGNA (WWF Italy), Giovanni BRAM-



BILLA (IA CNR) Fabrizio BULGARINI (WWF Italy), Sergio CASTELLARI (National Focal Point for Italy IPCC), Anna Maria DE MARTINO (Ministry of Labour, Health and Social Policies), Cinzia DI FENZA (FORMEZ - Area of Instruments and Policies for Environmental Sustainability; Naples), Alessandro LANZI (ENI), Alessandro Maria MICHETTI (University of Insubria - Como), Romano PAGNOTTA (IRSA CNR), Alessandro POLICHETTI (ISS), Sabina PORFIDO (IAMC CNR), Giuseppe RANDAZZO (University of Messina – Department of Earth Sciences), Ezio RUSCO (JRC; Ispra (EU), Paolo SEQUI (CRA), Paolo VECCHIA (ISS), Giuseppe VIVIANO (ISS), Michele VURRO (IRSA CNR).

Thanks

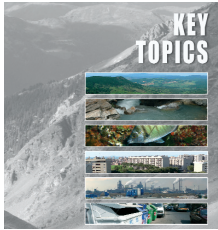
Heartfelt thanks are once again expressed to those whose contributions have made publication of the 2008 edition of the Yearbook possible.

The listing of those who have contributed in one way or another, an exercise that may prove tedious but is definitely deserved, further demonstrates, were there any need for such evidence, the complexity of the work behind this volume, which constitutes an indispensable reference for those who use environmental data and information in the course of their own activities or in order to keep themselves up-to-date on our country's environmental status.

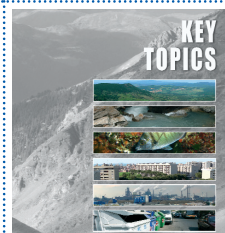
There is also no mistaking the fact that, in pursuing these objectives, ongoing efforts must be made to enlarge the network of cooperation with other organisations and institutions, without which it would prove impossible to provide a body of knowledge adequate to current demands.

These thanks go to everyone, including those who, though they contributed, are not explicitly mentioned. A few names may have been left out by mistake. We ask these people to accept our most sincere apology.

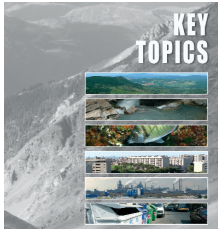
As was done for the previous editions, we again ask that readers send us any observations or suggestions for modifications they might have, so that, on the strength of such contributions, we can continue our ongoing improvements in the development of the Yearbook.



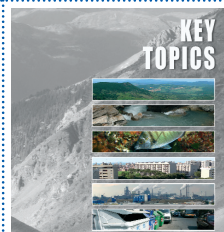
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I. PURPOSES AND STRUCTURE OF THE DOCUMENT



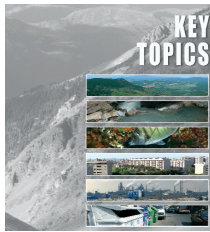
Purposes

This document is meant to provide a sufficiently thorough description of the state of the environment in Italy, especially as regards the topics held by the European Union to be “priority areas for policy initiatives”.

Unlike the complete edition of the Yearbook, which provides detailed descriptions by means of the indicator fact-sheets, this work offers the reader the environmental data structured according to the information base of the Yearbook, which follows the underlying logic of the DPSIR model.

In order to make the publication suitable for the most extensive possible use, the latest reporting techniques have been employed, together with a style of language both clear and precise.

Special care has been taken with the graphic illustration of the information, in order to streamline the communication of the contents. The images included in the text are always accompanied by comments on what is being shown.



Structure of the Document

The document is structured in 11 chapters: each of the first 10 focuses on a different environmental topic, while the eleventh is devoted to instruments of environmental knowledge.

Each environmental topic has been described according to the following logical sequence: first the current environmental conditions are presented, following by an analysis of the underlying causes of these conditions and, finally, a presentation of the solutions currently implemented or that will hopefully be put in place in the future. Special boxes have been included in this edition, where judged to be appropriate, for in-depth examination of certain topics, such as ultraviolet radiation.

There are three different ways of reading chapters one to ten: the text provides the reader with a complete and exhaustive analysis of the topics; the “focuses” in the margins serve for rapid identification of the topics addressed before deciding whether to examine them in depth; by consulting the graphs and the figures, the reader can obtain information that is sufficiently complete, though limited to the individual aspect illustrated.

The information elements found in the document are the end result of a painstaking selection process carried out on the far more extensive stock of information contained in fact-charts of the Yearbook Indicators Database. An annex provides an in-depth description of this important instrument utilised by the Institute to manage environmental information.

II. SOCIO ECONOMIC FRAMEWORK

Introduction

The characteristics of the country's territorial and socio-economic context and, in particular, the interrelations between demographic dynamics and the modes of behaviour of economic subjects (families and businesses), on the one hand, and the anthropogenic pressures that threaten the national environment (pollution of the air, water, land and nature, waste generation, consumption and deterioration of natural resources), and the other, are illustrated in the paragraphs that follow.

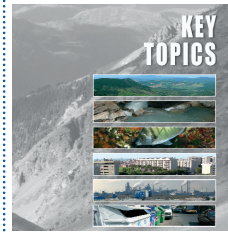
Emphasis is placed on territorial and socio-demographic characteristics, which provide a picture of the country's morphological make-up as well as a structural profile of the national population, with respect to the spending and consumption habits of families, as well as considerations of a more strictly economic nature. The "economic" factors analysed include the main macro-economic indicators and the characteristics of the national production system, with an in-depth look at the production sectors typically considered to be the driving forces behind the heaviest environmental pressures, such as: agriculture, the industrial and energy sector and transport and tourism.

II.1 Socio-demographic considerations

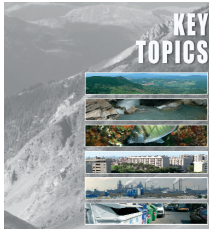
The question of the environment is closely tied to production activities and to the individuals found in a given territory. These two factors are the main underlying causes of pressures on the environment in terms of consumption, production of waste, emissions etc.. It follows that any analysis of the environmental situation must also take into account the demographic factor, which has noteworthy repercussions from a socio-economic point of view. As of 31 December 2007, the resident population in Italy was 59,619,290¹ inhabitants, making for an increase of 488,003 units over the previous year. As has been the case for a number of years now, this growth is due almost exclusively to immigration from abroad.

The population increase presents regional differences, as a result of contrasting dynamics that channel the majority of the migra-

¹ Source: ISTAT data processed by ISPRA



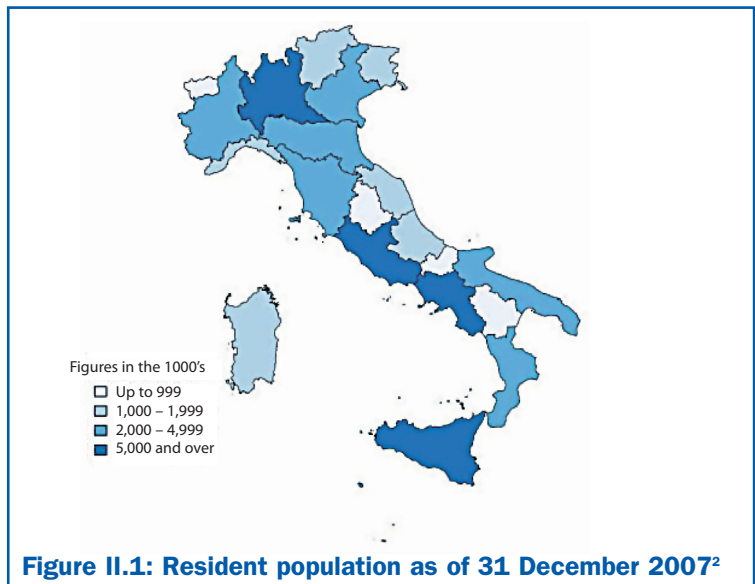
Environmental problems are closely connected with production activities and with the population found within the territory.



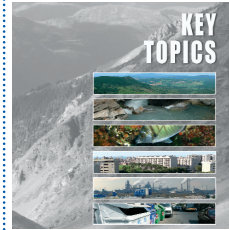
tory, both internal and from abroad, towards the regions of northern and central Italy. In terms of the territorial make-up, therefore, noteworthy differences can be observed not only between the surface areas of the different regions but as regards their demographic profiles as well.

The most heavily populated region, with more than 9.50 million residents, is Lombardy, followed by Campania (over 5.8 million) and Lazio (over 5.5). The regions with the largest surface area, on the other hand, are Sicily, Piedmont, Sardinia and Lombardy, in that order (Figure II.1). The geographic distribution of the resident as of 31 December 2007 shows 15,779,473 inhabitants on the northwest (26.5%), 11,337,470 in the northeast (19%), 11,675,578 in central Italy (19.6%), 14,131,469 in the south (23%) and 6,695,300 on the major islands (11.2%). In terms of levels of urbanisation, 45% of the Italian population lives in zones with high levels of urbanisation, 39% in zones with medium levels, and the remaining 16% in scarcely urbanised zones. Within Europe

The most heavily populated regions are Lombardy, Campania and Lazio.



² Source: ISTAT data processed by ISPRA

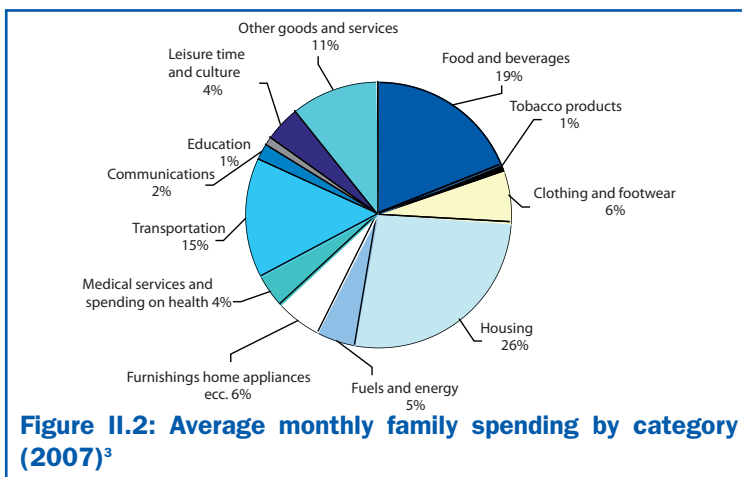


as a whole, Italy is one of the most densely populated countries. The most densely populated regions (2006), with respective figures of 426 and 400 inhabitants per km², are Campania and Lombardy.

Consumption patterns also reflect demographic changes, with variations on the family level having an especially noticeable effect on the allocation of available spending. It should be noted that, since 1990, growth in consumption has been much more vigorous than increases in available income, which, in per capita terms, has remained stable. In recent years per capita spending has also slowed down, after having registered average annual growth of 1.7% in the 90's.

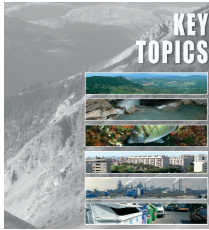
Average monthly spending per family in 2007, at current values, was equal to 2,480 euro (2,461 euro in 2006). Spending on food and beverages stood at 466 euro, while spending on non-food goods was 1,994 euro, with spending on housing and healthcare on the rise. Spending on food and beverages accounts for an average of 18.8% of the total monthly spending of families, while transport absorbs approximately 15% (Figure II.2). The national figures are the result of spending levels that differ among the various parts of the country, though the basic trend remains unchanged: in northern Italy average

Within Europe as a whole, Italy is one of the most densely populated countries. The most densely populated Italian regions, at respective levels of 426 and 400 inhabitants per km², are Campania and Lombardy.



Spending on food and beverages represents 18.8% of total monthly family spending, while transportation accounts for approximately 15% and housing for roughly 26%.

³ Source: ISTAT data processed by ISPRA



The region with the highest average spending per family is Veneto, at 3,047 euro, while the region with the lowest level is Sicily, at 1,764 euro.

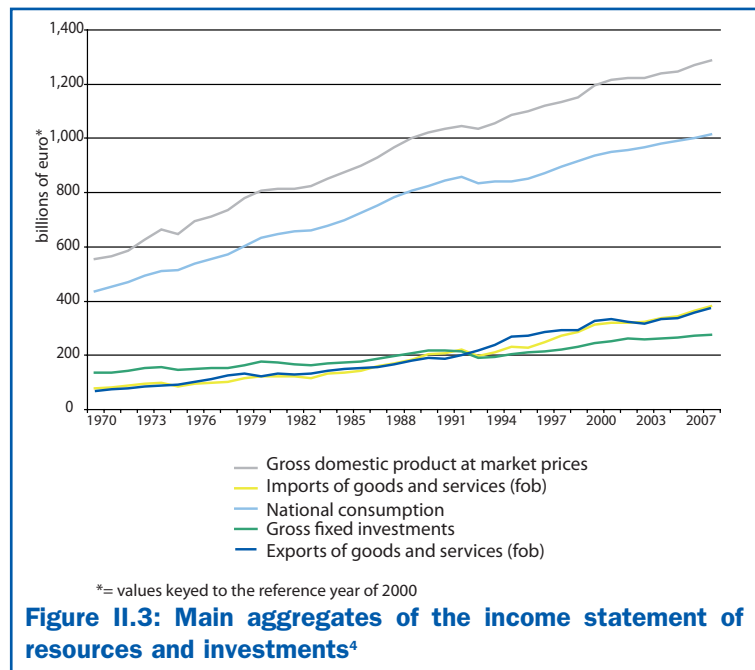
Between 1970 and 2007 the GDP, consumption and investments doubled. Imports and exports quadrupled.

monthly spending by families 2,796 euro (0.4% higher than the previous year), while the figure for central Italy is 2,539 euro (+1.8%) and that for the southern regions stands at 1,969 euro (+0.9%). Looking at the individual regions, Veneto presents the highest level, at 3,047 euro, while the lowest figures is found in Sicily, with average monthly family spending of 1,764 euro.

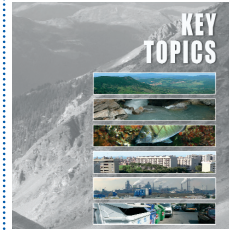
II.2 Economic factors

An analysis of the classic macroeconomic indicators, estimated on the basis of national statistics, highlights the distinctive features of Italy's economy.

Between 1970 and 2007, the main categories of the income statement for national resources and investments registered considerable growth, with the GDP doubling, as did consumption and investments, while imports and exports quadrupled (Figure II.3).



⁴ Source: ISTAT data processed by ISPRA



Looking at the specific figures for 2007 the Italian Gross Domestic Product (GDP), which gives the final result for all the goods and services produced in a country during a given period, stood at approximately 1.285 trillion euro, calculated in values keyed to the reference year of 2000, representing growth of 1.5% over the previous year.

Unlike the trend within the European Union (EU27), where the countries that start at the lower levels of per capita GDP – corrected for ppp⁵ – are the ones that grow the fastest, in Italy the southern regions are unable to close the gap with the richer northern zones.

As for consumption, which constitutes the main component of aggregate demand⁶, all the EU countries, except for Ireland and Luxembourg, present levels of consumption that exceed 70% of their GDP. In 2007 consumption in Italy (74% of which is tied to the family spending) was equal to 1.0125 trillion euro, or 79% of the GDP, while gross fixed investments accounted for 21%. In certain countries⁷, especially outside the EU (15), the sum of consumption and investments as percentages of the GDP is greater than 100, meaning that these countries consume and invest more than they produce, and thus need to draw on foreign markets.

The above situation, which holds for the majority of the countries outside of the EU(15), is also found in southern Italy, whose regions are forced to imports goods and services to sustain levels of consumption and investment which, taken together, exceed the GDP. In all the European Union member States (EU25), more than 60% of the GDP (70.4% in Italy) is generated by the tertiary sector (which includes banking activities, tourism, transport and insurance). Industry and agricultural, though they still play significant roles, have declined in economic importance in recent years. In Italy, the incidence of the primary sector in terms of value added for 2007 was only 2.5 percentage points, while the industrial sector (meaning industry in the strict sense, plus construction) accounted for 27%.

The national GDP for 2007, calculated in values keyed to the reference year of 2000, grew by 1.5% over 2006.

The gap between Italy's northern and southern regions is not being reduced.

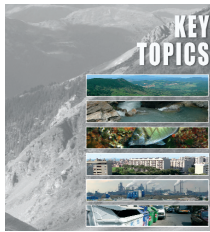
In almost all the countries of Europe, consumption amounts to 70% of the national GDPs.

In all the countries of the EU25, more than 60% of the GDP is generated by the tertiary sector.

⁵ ppp = purchasing power parity

⁶ Eurostat, New Cronos Database

⁷ Ibidem



Italy's central regions show a greater vocation for service enterprises, while micro-firms are predominant in the South, and medium-size enterprises are the most widespread in the northeast regions. Large-scale industry plays the leading role in the Northwest.

Compared to Europe as a whole, Italian companies are more focussed on manufacturing activities, with a marked specialisation in the sub-sectors referred to as "Made in Italy".

In Italy, industry produces roughly 27% of the value added to basic prices, with traditional industries contributing roughly 21%.

The composition by sectors of Italy's production structure, as shown by "ASIA"⁸, the archive of Italian enterprises of ISTAT for 2005, is similar to that illustrated for Germany in the Eurostat⁹ statistics for EU enterprises of 2004, though in Germany large-scale enterprises predominate, as is the case in all the economies of continental Europe. Within Italy, on the other hand, the central regions show a greater vocation towards service enterprises, though the two regions with the largest enterprises in the services sector are Lazio and Lombardy. As for the South, the predominant role is played by micro-enterprises, with a particular emphasis on the services sector in Campania, Calabria, Sicily and Sardinia, while industrial firms are the leading force in Apulia, Basilicata and Molise. In the northeast regions medium-size industrial enterprises are the most widespread, while large-scale industry is dominant in the northwest, and especially in Piedmont.

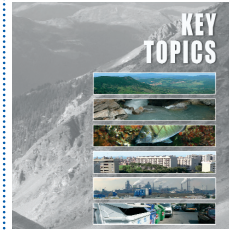
Industry

In 2006, there were 4.3 million Italian industrial and service enterprises, employing approximately 16.6 million workers (11.1 million salaried employees) and generating roughly 677 million euro of value added. The predominant role in the Italian production structure continues to be played by small-scale enterprises. Within the framework of Europe as a whole, our companies are more focussed on manufacturing activities (despite a late but rapid development of the service industries), with the chief manufacturing sub-sectors being those referred to under the umbrella term "Made in Italy". Specialisation in these primarily low-tech sectors was further reinforced in the early 2000's. The limited size of the great majority of Italian enterprises is accompanied by a high incidence of self-employment. This structural profile of the country's production system penalises our economy's prospects for future growth.

In Italy, industry produces roughly 27% of the value added to basic prices, with the contribution of traditional industry equal to approximately 21%.

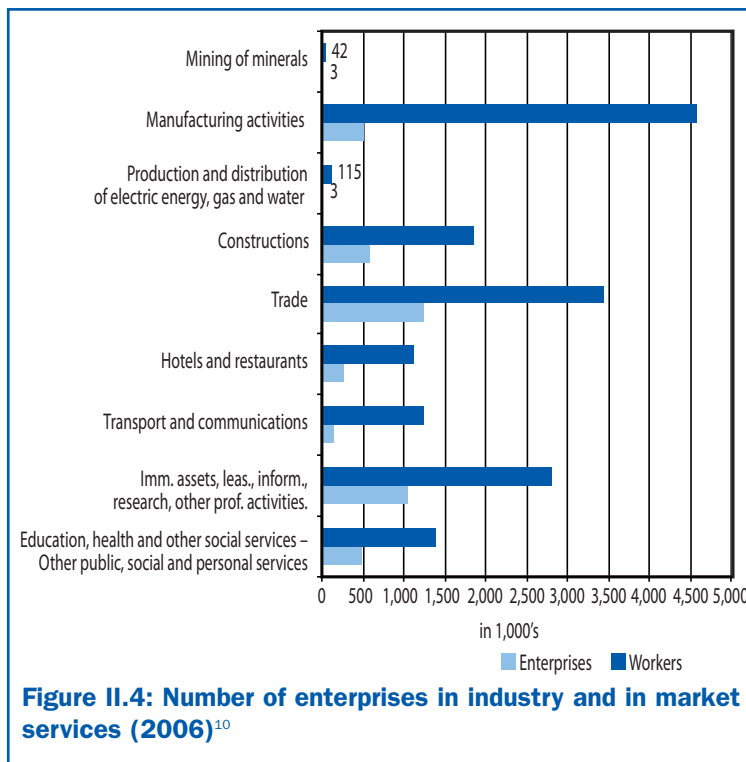
⁸ ISTAT, Statistical Archive on Active Enterprises (ASIA)

⁹ Eurostat, *Structural Business Statistics* (SBS)



In 2006 there were 1.12 million Italian industrial firms employing approximately 6.58 million workers (5.11 million salaried employees) and turning out value added of more than 300 billion euro. The average industrial firm had 5.9 employees, while each company in the sector of traditional industry operates with an average of 9.1 workers.

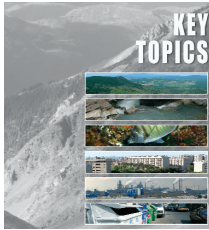
An analysis of the total number of people employed compared to the resident population highlights the fact that industrial activity is carried out primarily by the resident populations of Veneto, Lombardy, Emilia Romagna and Marche.



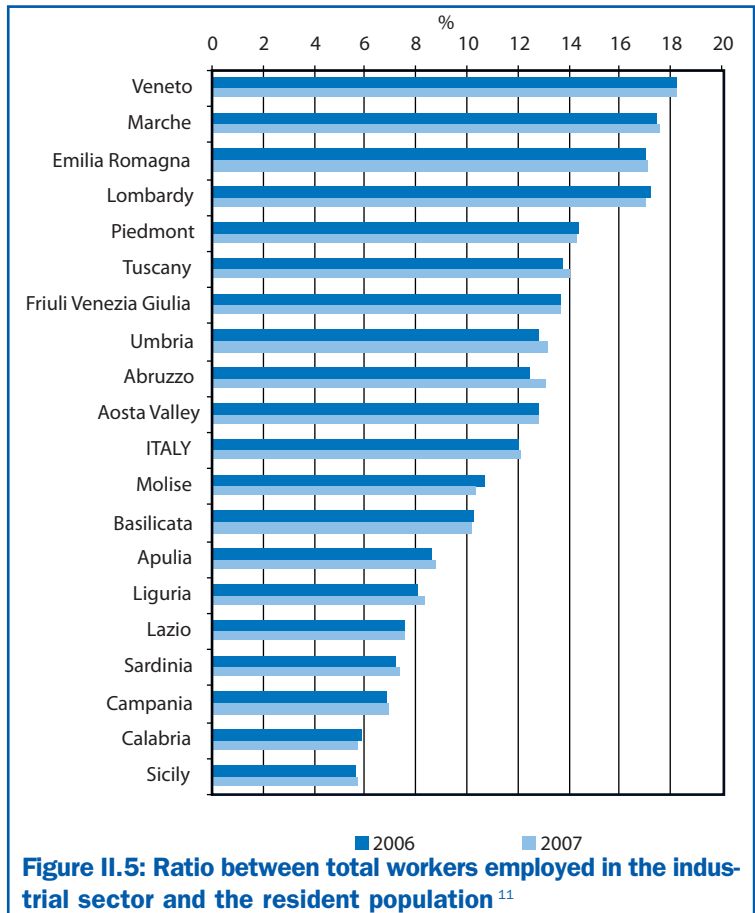
In 2006, there were 4.3 million Italian enterprises in the industrial and service sectors, employing approximately 16.6 million workers.

It was also found that the predominant vocation of the companies in the Italian production structures continues to be manufacturing activities.

¹⁰ Source: ISTAT (2008), *Struttura e competitività del sistema delle imprese industriali e dei servizi*



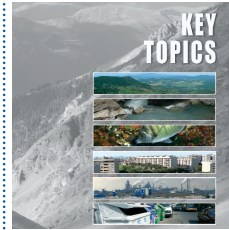
An analysis of the ratio of total individuals employed to the resident population points to the fact that industrial activities are performed primarily by the resident populations of Veneto, Lombardy, Emilia Romagna and Marche.



It should be stressed that the effect of the industrial sector on the environment regards not only the possibility of different forms of environmental pollution, but also the exploitation of natural resources. In recent years industry has increasingly been called upon to reconcile considerations of growth and competitiveness with those of environmental compatibility and sustainable development, optimising production processes and applying techniques to eliminate

The IPPC Directive (Integrated Pollution Prevention and Control) is the tool created by the European Union to implement of prevention

¹¹ Source: ISTAT (2008), *Principali aggregati dei conti economici regionali*, Rome



or minimise environmental impact while reducing the use of resources, raw materials and energy and observing principles of prevention, including:

- avoiding or reducing the production of pollutants;
- making effective use of energy resources and raw materials;
- reducing scrap and, if possible, recycling it within the production cycle.

Directive 96/61/EC, also known as the IPPC Directive (Integrated Pollution Prevention and Control), is the main instrument created by the European Union to implement the principles of prevention illustrated up to this point.

The IPPC Directive introduces the concept of the integrated environmental authorisation, which contains the upper limits for emissions, based on the determination of technological and managerial standards, as well as policy assessment criteria. Directive 96/61/EC was transposed into Italian law in a two-step process: first in part, for existing plants only – Legislative Decree 372/99 – and later in complete form – Legislative Decree 59/05¹².

On the national level, the collection of information on industrial emissions for the establishment of the INES Register is governed by a Ministerial Decree issued on 23 November 2001 and by a decree of the Italian Prime Minister, issued on 24 December 2002.

Since 2003, registration information on plants and information on the quality and the quantity of emissions in the air and water have been collected by means of the INES Declaration.

The information obtained on production establishments and IPPC activities with the INES Declaration for 2007, meaning that it refers to the year 2006, shows that the majority of the declarations regarding industrial establishments was received from northern Italy (67%). As in years past, the regions that accounted for the most declarations were Lombardy (29%), Veneto (11%), Emilia Romagna (10%) and Piedmont (8%), while the categories of IPPC activities most frequently referred to were those of IPPC group 1, regarding energy activities (23%), and IPPC group 6, which involves miscellaneous activities (25%).

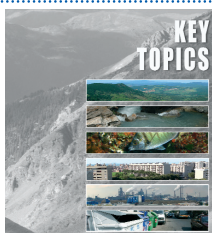
It is interesting to note that the number of industrial establishments in Italy considered to be at major accident hazards

that include:

- avoiding or reducing the production of pollutants;
- making effective use of energy resources and raw materials;
- reducing scrap, and, if possible, recycling it within the production cycle.

Of the INES declarations presented in 2006, for the year 2005, 64% were received from regions of northern Italy.

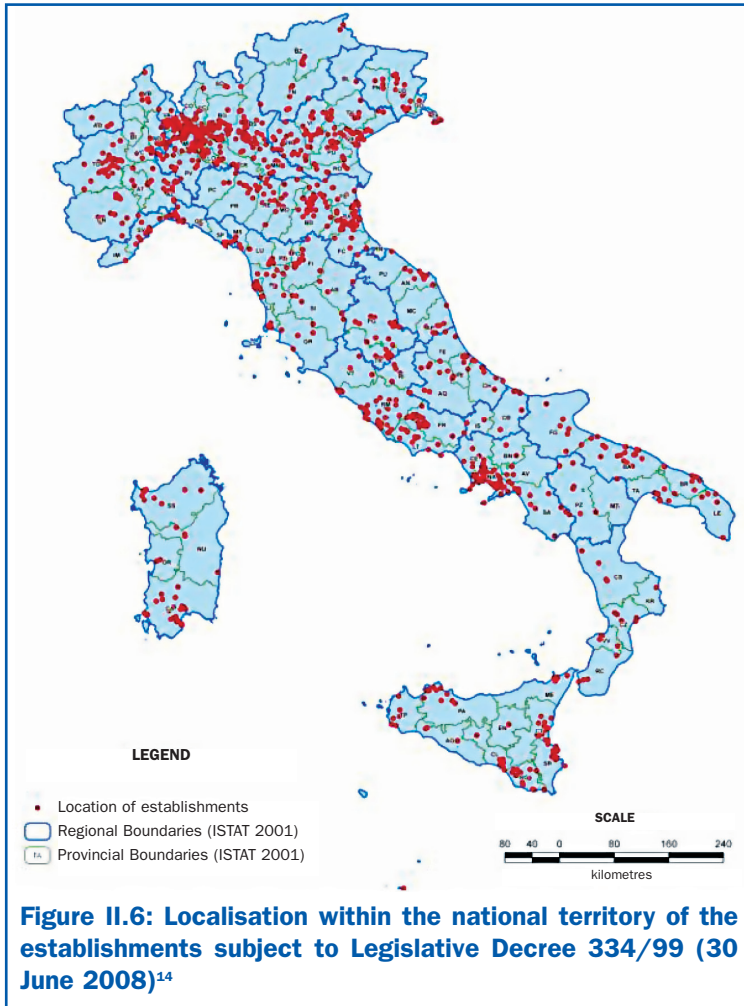
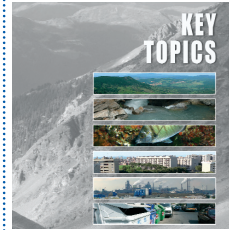
¹² Governs the integrated prevention of pollution, as well as the issue, renewal and review of the unified environmental authorisation.



As of 30 June 2008 there are 1,119 industrial establishments considered to be at major accident hazard (MAH) in Italy and subject to the obligations contained in arts. 6/7 and 8 of Legislative Decree 238/05.

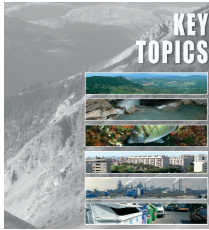
(MAH)¹³, and therefore subject to the obligations stipulated under arts. 6/7 and 8 of Legislative Decree 238/05 (which partially modified the earlier Legislative Decree 334/99) was equal to 1,119 as of 30 June 2008. In terms of the distribution within the national territory of the establishment subject to notification (under arts. 6/7 and art. 8 of Legislative Decree 334/99), fully a fourth are found in Lombardy, with especially noteworthy numbers in the provinces of Milan, Bergamo, Brescia and Varese. The other regions with significant numbers of industrial operations posing risks are: Piedmont, Emilia Romagna and Veneto (accounting for approximately 9%). Such activities are particularly concentrated in areas holding long-time refining and/or petrochemical complexes, such as Trecate (in the vicinity of Novara), Porto Marghera, Ferrara and Ravenna, and in the industrial areas of the provinces of Turin, Alessandria, Bologna, Verona and Vicenza. The central-southern regions with the highest levels of activities requiring notification are: Sicily (roughly 7%), Lazio and Campania (slightly more than 6%), Tuscany (approximately 5%), Apulia and Sardinia (approximately 4%); this is due to the presence of petroleum and petrochemical plants in the areas of Gela (Province of Caltanissetta), Augusta-Priolo-Melilli-Siracusa, Brindisi, Porto Torres (Province of Sassari) and Sarroch (Province of Cagliari), as well as the concentrated presence of industrial activities in the provinces of Livorno, Rome, Frosinone, Naples and Bari, plus the depots for agricultural products in the Province of Ragusa.

¹³ A “Major-accident Hazards Establishment” (MAH establishment) is defined as a establishment where potentially hazardous substances (used in the production cycle or simply kept in storage) are found in quantities above certain threshold levels.



A fourth of the establishment requiring notification (arts. 6/7 and art. 8 of Legislative Decree 334/99) are concentrated in Lombardy, and in the provinces of Milan, Bergamo, Brescia and Varese.

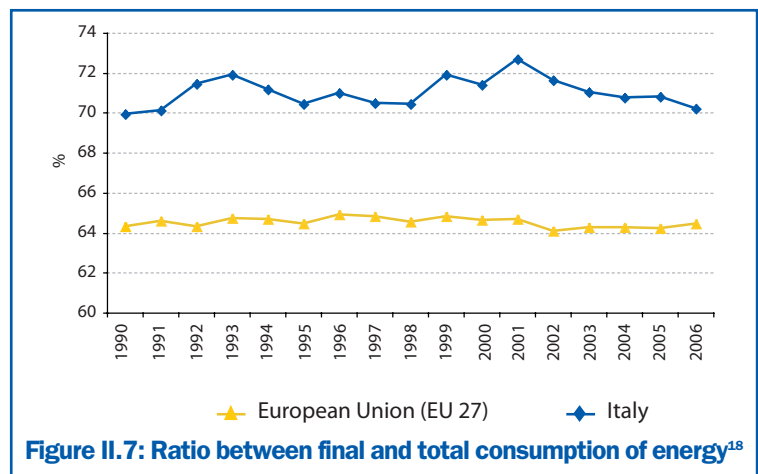
¹⁴ Source: Ministry of the Environment, Land and Sea data processed by ISPRA



Energy

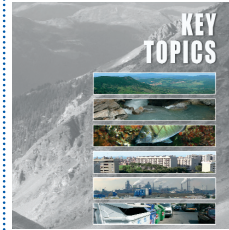
As far as the energy sector in Italy is concerned, the most recent data (ISPRA and ENEA¹⁵) point to a number of different results, including the fact that primary energy intensity¹⁶ is lower than the European average, though a comparison with the situation in the rest of Europe over the years shows that the benefits enjoyed by Italy on account of its initially favourable position in terms of energy intensity are gradually declining, due to the fact that the situation has remained essentially unchanged in Italy over the last decade, while almost all the other European countries have registered improvements. It should also be noted that the ratio between final consumption and total consumption of energy in Italy is higher than the European average, pointing to greater overall efficiency when it comes to converting the energy contained in primary sources¹⁷. The demand for primary energy totalled 194.5 Mtep in 2007, down by roughly a percentage point compared to 2006. Electricity produced

Italy's ratio of final consumption to total consumption is higher than the European average, pointing to greater overall efficiency in the conversion of the energy found in primary sources.

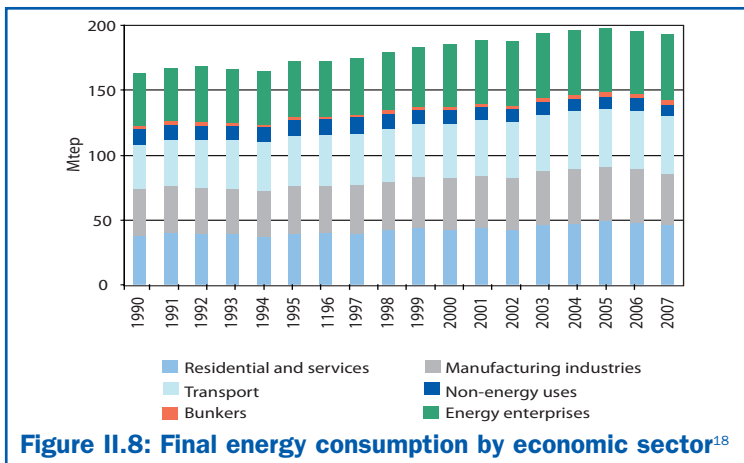


¹⁵ ENEA (2008). *Rapporto Energia e Ambiente 2007, Analisi e scenari*.
¹⁶ The “primary energy intensity” indicator measures the energy efficiency of economic systems, meaning the quantity of energy needed per unit of GDP produced.
¹⁷ The difference between these two figures corresponds to the energy consumed in processes of conversion (such as the production of electricity and the refining of oil), the energy consumed inside plants that produce electricity and the leakage in distribution and supply activities.

¹⁸ Source: Eurostat data processed by ENEA

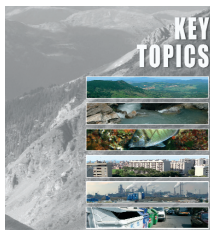


from renewable sources as a percentage of total production of electricity in 2007 was 15.7%, due primarily to the significant contribution of hydroelectric energy. But despite the noteworthy increase registered in recent years, the results for the production of electricity from such sources do not appear adequate for achieving the objective set under Directive 2001/77/EC of approximately 75 TWh by the year 2010. Also observed are a series of ongoing changes in energy supplies, with a sharp reduction in the consumption of oil, while natural-gas consumption grows, compared to that of petroleum products, and renewable sources and cogeneration contribute to the overall energy picture, along with, since 2001, the consumption of solid fuels. The demand for petroleum products still exceeds that for other sources, covering 42.6% of total primary consumption in 2007, due almost exclusively to the energy needs of the transportation sector. The upward trend in the total consumption of energy, with an increase of +19.9% between 1990 and 2006, was interrupted in 2007, which showed a decrease of 3.3% over the preceding year. The main sectors in which strong growth in final consumption had been recorded since 1990 presented lower figures in 2007. Looking at the break-down of consumption of final energy (excluding non-energy uses and bunker), the transport absorbed 34.3% of consumption, followed by the civil 32.8% and industrial sectors 30.4%.



The demand for primary energy totalled 194.5 Mtep in 2007, approximately one percent less than in 2006. The primary sectors that showed growth from 1990 onward registered decreases in 2007. Looking at the break-down of final energy consumption, the transport sector absorbed 34.3%, followed by the civil 32.8% and industrial sectors 30.4%.

¹⁹ Source: Ministry of Economic Development



Agricultural activities generate pressures, but they are also affected by changes in ecosystems.

Agriculture plays a key role in safeguarding the countryside and the territory, making a valuable contribution to the management of the natural resources found in agricultural ecosystems.

In 2007 the Utilised Agricultural Area was equal to 12,744,196 hectares nationwide.

Total farming enterprises number 1,679,439.

Agriculture

By their very nature, agricultural activities are closely tied to the environment.

They not only generate pressures, such as pollution of the key elements of the environment, consumption of water resources and loss of biodiversity, but are in turn affected by the changes in ecosystems caused by climate change, plus the competition of other economic activities for the resources utilised.

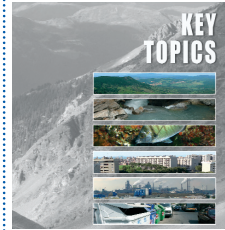
In addition, agriculture plays a major role in defending the countryside and the territory, making a valuable contribution to the management of the natural resources found in agricultural ecosystems and to the attenuation of critical trends, such as the greenhouse effect and hydrogeological deterioration.

This extremely positive function is a declared objective of European Community Agricultural policy. Starting from 2005, farmers who receive direct economic subsidies from the EC are subject to obligatory conditions. No fewer than 19 legislative acts place direct constraints on agricultural enterprises with regard to the environment, public health and the health of plants and animals. Under these acts, farmers who wish to benefit from direct subsidies undertake to maintain all the land utilised in good condition from an agricultural and environmental perspective. Penalties are contemplated for failure to do so, such as the partial or full cancellation of the direct subsidy.

Nationally, the Utilised Agricultural Area totalled 12,744,196 hectares in 2007 (Table II.1), representing a slight increase over 2005 (+0.3%) but a level lower than that of 2000 (-2.4%). Compared to 2000, the most noteworthy decreases were observed in the northern (-4.2%) and central regions (-4.5%).

The total number of farming enterprises was 1,679,439, down from 2005 (-2.8%) and compared to 2000 (-22%).

The highest concentration of farming concerns is found in the South (960,736 units), a figure again lower than in 2005 (-3.2%) and even more of a decrease compared to 2000 (-19.8%). Next comes the North, with 449,880 units, and Central Italy, at 268,823 units. This last figure presents the most noticeable decrease compared to 2000 (-28.5%).



| Region/ Autonomous province | Utilised Agricultural Area | | | | |
|-----------------------------------|----------------------------|-------------------|-------------------|---------------|---------------|
| | 2007 | 2005 | 2000 | 2007/ 2005 | 2007/ 2000 |
| | number | | | % | |
| Piedmont | 1,040,185 | 1,029,189 | 1,068,079 | 1.1 | -2.6 |
| Aosta Valley | 67,878 | 68,391 | 71,156 | -0.8 | -4.6 |
| Lombardy | 995,323 | 978,667 | 1,039,397 | 1.7 | -4.2 |
| Trentino Alto Adige | 399,140 | 401,078 | 414,273 | -0.5 | -3.7 |
| <i>Bolzano-Bozen</i> | <i>258,010</i> | <i>255,668</i> | <i>267,394</i> | <i>0.9</i> | <i>-3.5</i> |
| <i>Trento</i> | <i>141,129</i> | <i>145,410</i> | <i>146,878</i> | <i>-2.9</i> | <i>-3.9</i> |
| Veneto | 820,201 | 797,571 | 849,880 | 2.8 | -3.5 |
| Friuli Venezia Giulia | 228,063 | 224,521 | 237,747 | 1.6 | -4.1 |
| Liguria | 49,408 | 49,082 | 60,895 | 0.7 | -18.9 |
| Emilia Romagna | 1,052,585 | 1,029,916 | 1,114,592 | 2.2 | -5.6 |
| Tuscany | 806,428 | 809,487 | 848,171 | -0.4 | -4.9 |
| Umbria | 339,404 | 337,915 | 363,560 | 0.4 | -6.6 |
| Marche | 496,417 | 497,141 | 505,610 | -0.1 | -1.8 |
| Lazio | 674,011 | 684,936 | 706,936 | -1.6 | -4.7 |
| Abruzzo | 434,013 | 425,179 | 425,984 | 2.1 | 1.9 |
| Molise | 200,257 | 212,608 | 213,166 | -5.8 | -6.1 |
| Campania | 562,880 | 563,666 | 575,872 | -0.1 | -2.3 |
| Apulia | 1,197,380 | 1,216,924 | 1,223,401 | -1.6 | -2.1 |
| Basilicata | 542,256 | 553,589 | 533,438 | -2.0 | 1.7 |
| Calabria | 514,047 | 514,343 | 540,055 | -0.1 | -4.8 |
| Sicily | 1,251,851 | 1,250,703 | 1,256,534 | 0.1 | -0.4 |
| Sardinia | 1,072,469 | 1,062,940 | 1,013,512 | 0.9 | 5.8 |
| ITALY | 12,744,196 | 12,707,846 | 13,062,256 | 0.3 | -2.4 |
| North | 4,652,783 | 4,578,414 | 4,856,018 | 1.6 | -4.2 |
| Central | 2,316,260 | 2,329,479 | 2,424,277 | -0.6 | -4.5 |
| South | 5,775,153 | 5,799,953 | 5,781,961 | -0.4 | -0.1 |

In 2007 Utilised Agricultural Area was equal to 12,744,196 hectares nationwide, a slight increase over 2005 (+0.3%), but lower than the figure for 2000 (-2.4%).

The term Standard Gross Margin (SGM) refers to “the average level of pre-tax income in a given region or province and for a given production activity”²¹.

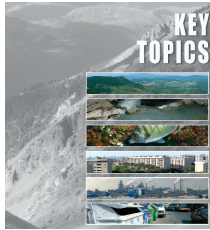
Used to determine the economic dimensions of farming enterprises, it is expressed in the European Size Unit (ESU), which is equal to 1,200 ECU of total standard pre-tax income.

The total national SGM for 2007 (Table II.2) was 25,000,347 ESU,

Standard Gross Margin (SGM) is used to determine the economic dimensions of agricultural enterprises.

²⁰ Source: ISTAT data processed by ISPRA

²¹ INEA definition under the RICA methodology.



More than 46% of the SGM for 2007 was produced in the North.

The overall national SGM for 2007 was 25,000,347 ESU, a marked increase over both 2005 (+12.6%) and 2000 (+31.2%).

making or a noteworthy increase over 2005 (+12.6%) and 2000 (+31.2%).

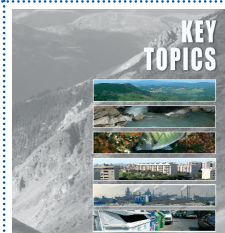
More than 46% of the SGM for 2007 was produced in Northern Italy, another 40% in the South, and the remaining 14% in the central regions. This break-down matches that registered in the years 2005 and 2000.

Table II.2: Regional break-down of Standard Gross Margin²²

| Region/ Autonomous Province | Standard Gross Margin | | | | |
|-----------------------------------|-----------------------|-------------------|-------------------|---------------|---------------|
| | 2007 | 2005 | 2000 | 2007/ 2005 | 2007/ 2000 |
| | ESU ^(a) | | | % | |
| Piedmont | 1,700,095 | 1,652,500 | 1,344,352 | 2.9 | 26.5 |
| Aosta Valley | 24,582 | 18,819 | 28,080 | 30.6 | -12.5 |
| Lombardy | 3,074,087 | 3,084,324 | 2,355,733 | -0.3 | 30.5 |
| Trentino Alto Adige | 894,663 | 583,284 | 656,585 | 53.4 | 36.3 |
| <i>Bolzano-Bozen</i> | 494,919 | 342,222 | 372,090 | 44.6 | 33.0 |
| <i>Trento</i> | 399,744 | 241,062 | 284,496 | 65.8 | 40.5 |
| Veneto | 2,254,964 | 2,199,150 | 1,805,557 | 2.5 | 24.9 |
| Friuli Venezia Giulia | 415,106 | 417,349 | 413,819 | -0.5 | 0.3 |
| Liguria | 248,497 | 229,765 | 261,523 | 8.2 | -5.0 |
| Emilia Romagna | 2,918,622 | 2,218,554 | 2,265,979 | 31.6 | 28.8 |
| Tuscany | 1,197,857 | 1,106,719 | 1,021,881 | 8.2 | 17.2 |
| Umbria | 376,811 | 391,268 | 326,051 | -3.7 | 15.6 |
| Marche | 611,262 | 506,587 | 498,048 | 20.7 | 22.7 |
| Lazio | 1,310,166 | 1,132,687 | 906,985 | 15.7 | 44.5 |
| Abruzzo | 619,202 | 517,262 | 441,639 | 19.7 | 40.2 |
| Molise | 226,157 | 181,728 | 181,735 | 24.4 | 24.4 |
| Campania | 1,728,687 | 1,622,173 | 1,309,423 | 6.6 | 32.0 |
| Apulia | 2,322,378 | 1,880,380 | 1,858,058 | 23.5 | 25.0 |
| Basilicata | 452,722 | 485,133 | 405,171 | -6.7 | 11.7 |
| Calabria | 1,184,102 | 1,095,877 | 827,155 | 8.1 | 43.2 |
| Sicily | 2,243,136 | 2,022,322 | 1,500,249 | 10.9 | 49.5 |
| Sardinia | 1,197,251 | 850,406 | 654,091 | 40.8 | 83.0 |
| ITALY | 25,000,347 | 22,196,286 | 19,062,114 | 12.6 | 31.2 |
| North | 11,530,616 | 10,403,744 | 9,131,629 | 10.8 | 26.3 |
| Central | 3,496,096 | 3,137,262 | 2,752,965 | 11.4 | 27.0 |
| South | 9,973,636 | 8,655,281 | 7,177,521 | 15.2 | 39.0 |

^(a) The economic dimensions of agricultural enterprises are measured in European Size Units (ESU). An ESU is equal to 1,200 ECU of total standard gross margin.

²² Source: ISTAT



Plant health products are of use in protecting vegetables or vegetable products from harmful organisms, such as fungi, insects, mites, bacteria, viruses and weeds, and in favouring or regulating the vital processes of vegetables (not including fertilisers). In 2006 (Table II.3) approximately 149 thousand tons of such products were put on the market, a decrease of 4.7% compared to 2005. Fungicides account for 50.9% of the total, followed by insecticides and miticides (18.1%), herbicides (17.8%), miscellaneous products (fumigators, plant regulators, molluscicides, carriers and other) (12.9%) and biological items (0.2%).

Compared to 1997, distribution has fallen by 10.8%. Decreases were registered in all categories, and especially for insecticides and miticides (-31%), apart from “miscellaneous”, which rose by 31.5%.

Plant care products are of use in protecting vegetables or vegetable products from harmful organisms.

Compared to 1997, distribution has fallen by 10.8%.

Tabella II.3: Distribution of plant care products by category²³

| Category | 1997 | 2005 | 2006 |
|----------------------------|----------------------|----------------|----------------|
| | Quantity distributed | | |
| | t | | |
| Fungicides | 84,450 | 82,439 | 75,891 |
| Insecticides and miticides | 39,161 | 29,307 | 27,036 |
| Herbicides | 28,889 | 25,746 | 26,542 |
| Miscellaneous | 14,589 | 18,480 | 19,182 |
| Biological | n.a. | 425 | 344 |
| TOTALS | 167,090 | 156,398 | 148,996 |
| n.a.: data not available | | | |

In 2006 approximately 149 thousand tons of plant care products were placed on the market.

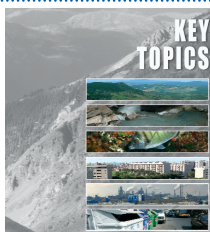
Fungicides represented 50.9% of the total.

Emilia Romagna (Figure II.9), at almost 20,000 t (13.2% of the national total) is the region with the highest distribution. Next come Sicily (13.1%), Veneto (11.8%), Apulia (11.5%) and Piedmont (8.4%).

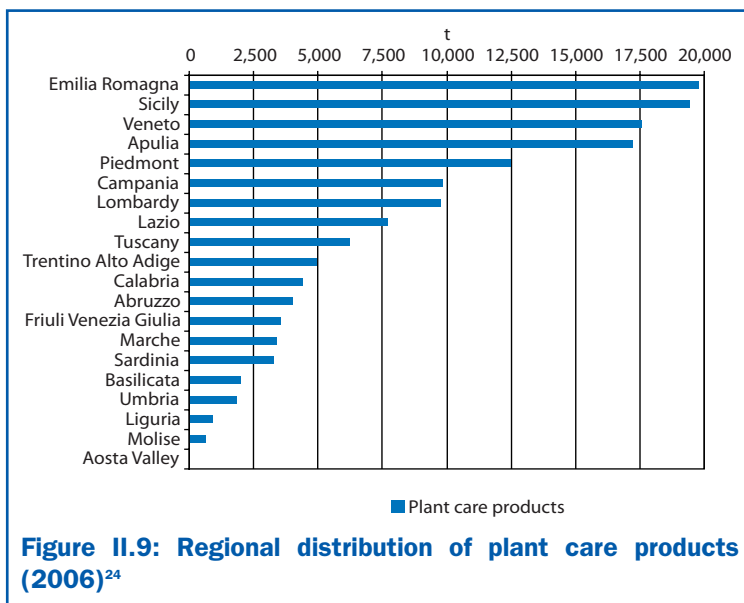
More than half the national total (58%), therefore, is distributed in these five regions.

Emilia Romagna, with almost 20,000 t (13.2% of the national total), is the region with the highest distribution.

²³ Source: ISTAT data processed by ISPRA



More than half the national total (58%) is distributed in only five regions: Emilia Romagna (13.2%), Sicily (13.1%), Veneto (11.8%), Apulia (11.5% and Piedmont (8.4%).



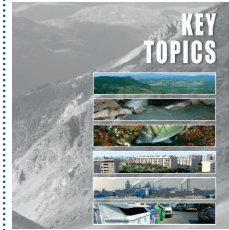
The total quantity of fertilisers distributed in Italy was 5,443,730 tons in 2007 (Table II.4). Approximately 60% was used in the North, 24% in the South and 16% in the Central regions.

The quantity of fertilisers distributed in Italy in 2007 totals 5,443,730 tons.

| Type | Quantity distributed |
|-------------------------------|----------------------|
| | t |
| Mineral fertilisers | 3,385,294 |
| Organic fertilisers | 333,443 |
| Organic-mineral fertilisers | 396,219 |
| Soil conditioners | 1,190,551 |
| Correctives | 125,551 |
| Crop substrates | 11,573 |
| Products with specific action | 1,099 |
| Total fertilisers | 5,443,731 |
| <i>North</i> | 3,254,146 |
| <i>Central</i> | 874,822 |
| <i>South</i> | 1,314,763 |

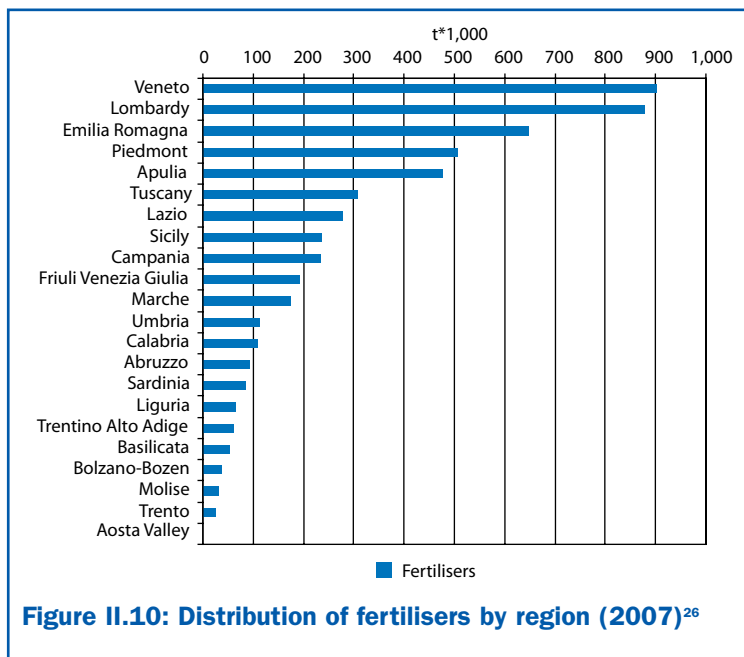
²⁴ Source: ISTAT data processed by ISPRA

²⁵ Source: ISTAT



At 901,796 tons (Figure II.10), Veneto is the region with the highest distribution. Next come Lombardy (878,425 t) and Emilia Romagna (646,720 t). These three regions alone account for approximately 45% of the total fertilisers distributed.

Veneto is the leader in the distribution of mineral fertilisers, organic fertilisers and correctives. Lombardy ranks first in terms of soil conditioners, while Emilia Romagna uses the most crop substrates.



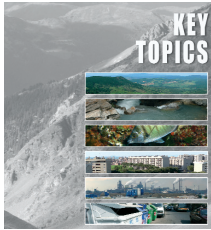
Veneto, at 901,796 t, is the region with the highest level of distribution. Next come Lombardy (878,425 t) and Emilia Romagna (646,720 t). These three regions alone account for roughly 45% of the total fertilisers distributed.

Transport and Mobility

Looking at all modes of transport in Italy, mobility of freight and passengers shows constant growth in recent years. Total domestic freight transport for 2007, estimated at slightly more than 243 billion km-tons, shows an increase of 19% over 2003.

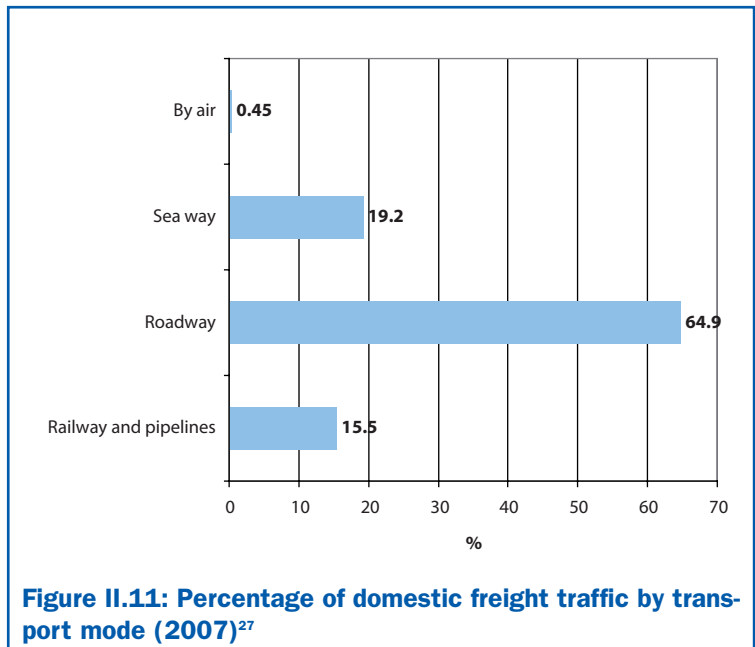
Looking at all modes of transport in Italy, mobility of freight and passengers shows constant growth in recent years.

²⁶ Source: ISTAT



A break-down of the freight traffic data by mode of transport points to an absolute predominance of roadway traffic, which, in 2007, still absorbed 64.9% of the total km-tons transported. In the same year, the percentages absorbed by the remaining modes of transport were: 19.2% by sea-way; 15.5% by railway and pipeline; 0.45% by air-way, which continues to cover only a minimal portion of domestic freight transport, being devoted primarily to international transport (Figure II.11).

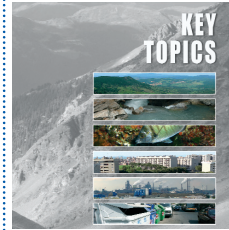
In 2007, roadway transport once again proved to be the predominant mode, accounting for 64.9% of the km-tons transported.



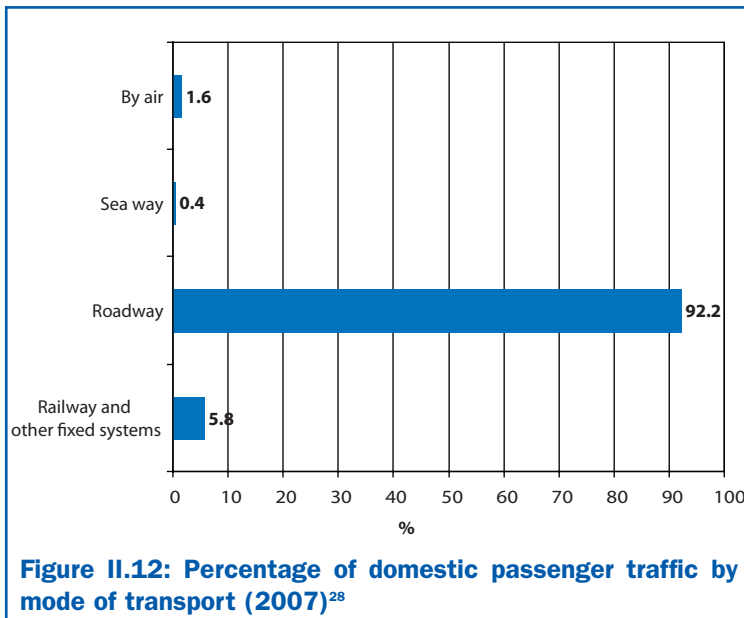
Domestic passenger transport shows a fluctuating trend for the period 2003-2007, with a decrease of 2.3% in 2007.

Domestic passenger transport shows a fluctuating trend during the period 2003-2007, with growth of 6.5% in 2006, compared to 2005, followed by a decrease of -2.3% in 2007, as compared to the previous year. Despite this fragmented trend, there was an overall increase of 2.6% between 2003 and 2007.

²⁷ Source: CNT data (2006-2007) processed by ISPRA



As in the case of freight transport, the roadway mode is clearly predominant, with 92.2% of the total. The percentages of the other modes remain virtually unchanged, with respective values of 5.8% for transport by railway and other fixed-route systems, 1.6% for air transport and only 0.4% for transport by sea (Figure II.12).



Looking at domestic passenger transport, roadway travel is virtually the only mode used (92.2%).

A more detailed analysis of traffic, broken down by the different modes of transport, highlights a variety of situations. The data on air traffic, based on the number of movements of commercial aircraft (domestic and international), shows +16.8% growth in 2007, as compared to 2004²⁹.

Turning to vehicle traffic, an increase of 61% was registered between 1990 and 2007 in the kilometres travelled by light and heavy vehicles on Italian highways³⁰.

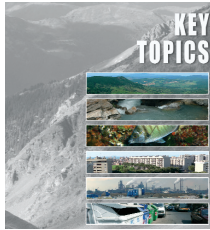
Commercial air transport grows by 16.8% between 2004 and 2007.

Vehicle traffic registers a 61% increase in km travelled on Italian highways between 1990 and 2007. Between 2004 and 2006, passenger transport on the railway network rose by 2.5%, while freight transport shows a 3.4% increase.

²⁸ Source: CNT data (2006-2007) processed by ISPRA

²⁹ Source: ENAC data processed by ISPRA

³⁰ Source: AISCAT data processed by ISPRA



As of 31 December 2006, the primary Italian roadway network (not including municipal roads) shows an overall increase of approximately 4.6% compared to 2000.

Between 2000 and 2006 the railway network grew by 771 km.

Maritime transport registered an increase of 36.1% in 2007, compared to 2001.

As for railway traffic 306 million train-km of passenger transport circulated in 2006 on the State Railway system (+2.5% compared to 2004), and 65 million train-km of freight transport (+3.4% compared to 2004).

To better understand the potential pressures exerted in our country, it is necessary to examine the state of its transport equipment and infrastructures.

As of 31 December 2006, the primary Italian roadway network (not including municipal roads) was 175,442 kilometres long, consisting of 6,554 km of motorways, 21,524 km of other roads of national importance and 147,364 km of regional and provincial roads, for an overall increase of 4.6% compared to 2000.

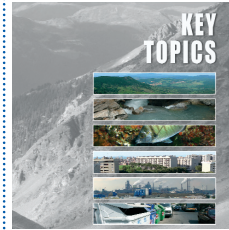
Looking at the statistics on roadway traffic, the figures provided by the AISCAT (Italian Association of Motorway and Tunnel Concessionarie Companies) on the volumes of traffic recorded on the motorway network operated under government concessions (5,654.7 km as of 31 December 2007), shows that the daily average theoretical vehicles in circulation in 2007 numbered more than 42.1 million, consisting of 32 million light vehicles (75.9%) and 10.1 million heavy vehicles (24.1%).

As for the railway network, its total track length as of 2006 was approximately 20,188 km, or 771 km more than in 2000. More significant increases are registered in the lengths of the electrified network and the two-track network, which grew by respective figures of 6.8% and 12.9%.

The available statistics also point to a significant quantity of port infrastructures in Italian territory. As of 1st January 2007, there were 263 ports, with total dock length of slightly more than 401 kilometres, making for an average of approximately 263 metres per berth and 1.5 per port.

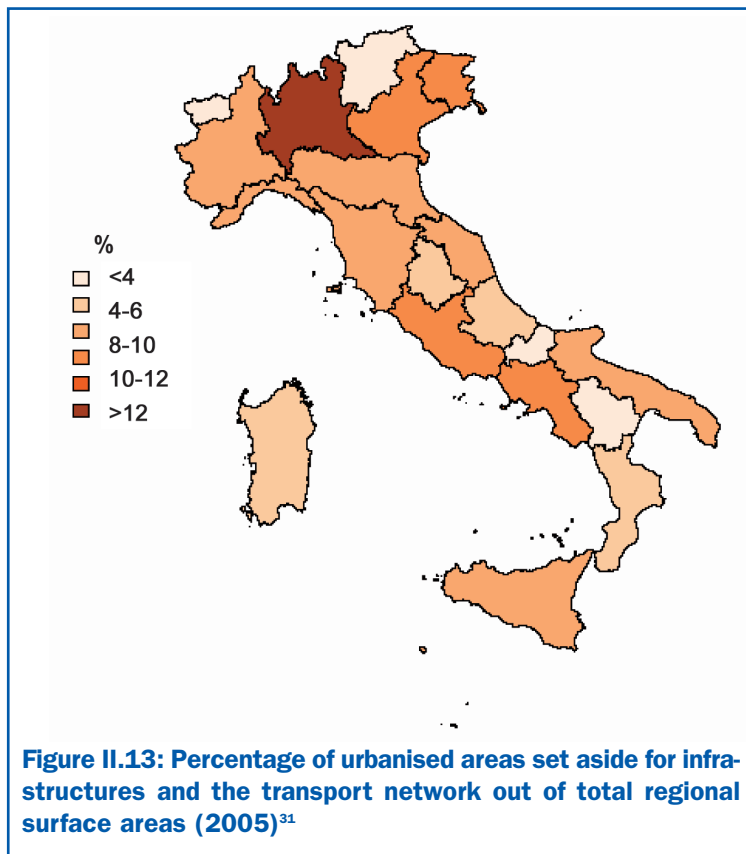
Maritime traffic recorded an increase of 36.1% in 2007, as compared to 2001, with a total of 1,523 dockings.

Examining airport infrastructures in Italy, there were 100 airports distributed throughout Italian territory in 2007, one less than in 2006, while the airport grounds covered a surface area of approximately 150.6 km² and runway length totalled approximately 202 km.



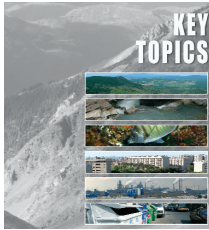
An overview of the urbanised surface area set aside for infrastructures and the transport network is provided by Figure II.13, which illustrates the percentage of the total surface area found in for each region. The region with the highest infrastructure density is Lombardy, with a percentage of more than 12.3%, followed by a set of regions in the range of 8-10%: Veneto (9.7%), Campania (8.9%), Friuli Venezia Giulia (8.3%) and Lazio (8.2%).

Domestic airports covered a total surface area of 150 km² in 2007, and overall runway length was approximately 202 km.



The region with the highest density of infrastructures is Lombardy, with more than 12.3% of the total, followed by regions falling in a range of 8-10%: Veneto (9.7%), Campania (8.9%), Friuli Venezia Giulia (8.3%) and Lazio (8.2%).

³¹ Source: Ministry of Infrastructures and Transportation data, ISTAT data and APAT-CLC 2000 (urbanised) data processed by ISPRA



Tourism and the environment are closely connected.

Europe receives 54% of international arrivals.

Tourist arrivals and overnight stays in Italy grew by respective figures of 3.3% and 2.7%.

Arrivals and overnight stays of tourists involve a temporary population increase that can disturb the socio-environmental balances.

Tourism

It is impossible to address the subject of tourism without making reference to the environment, given the reciprocal interests and dynamics, based on social, historical and cultural factors, between the two sectors. There is a special tie between tourism and the environment, because tourist activities utilise environmental resources, in the broadest sense of the term, as an indispensable asset for their development, while, at the same time, the environment benefits from the resources brought into play by tourist activities, assuming such operations are compatible with the environment.

Even though Europe is the most mature tourist destination, it also remains the one most visited (54% of all international arrivals), showing an increase of 5% in arrivals in 2007.

Tourist arrivals and overnight stays in all of Italy's hospitality structures grew (by respective figures of 3.3% and 2.7%) in 2007, with foreign arrivals and overnight stays, which rose by 4%, contributing significantly. The average stay (3.9 days) continued to decline, confirming the trend of recent years towards more frequent trips but for shorter periods.

Tourist flows represent a temporary increase in the population, with all the problems that arise when the capacity of a system designed to service the resident population is exceeded. An exaggerated increase in the population inevitably leads to a deterioration in the quality of life, negatively affecting living standards, safety, transport, water treatment, waste disposal etc. Similar situations can be found in certain regions, such as Trentino Alto Adige and Aosta Valley, whose ratios of "arrivals/inhabitants" (8.2 and 6.7) and "overnight stays/inhabitants" (41.7 and 24.7) are significantly higher than the national levels (Figure II.14).

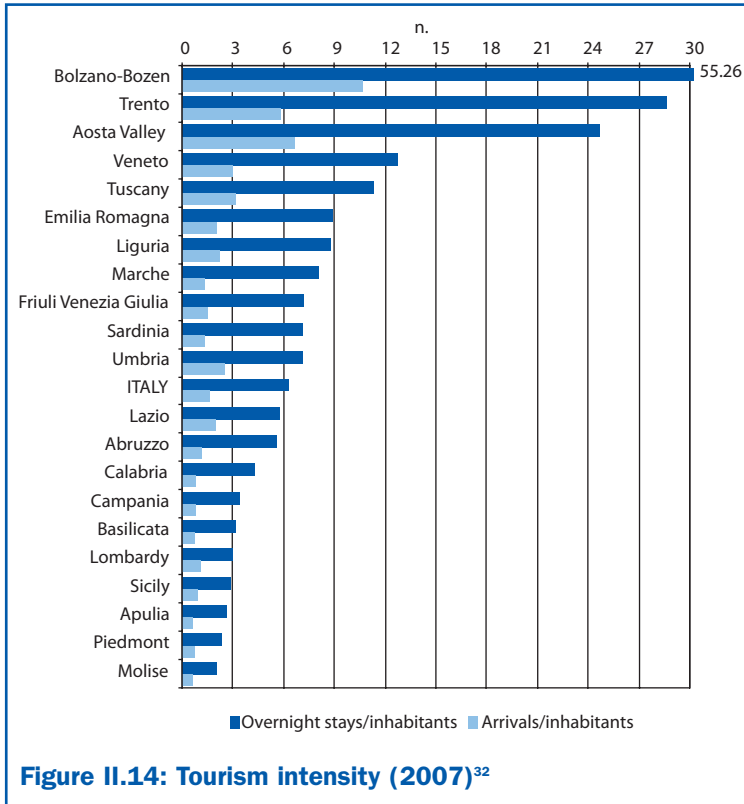
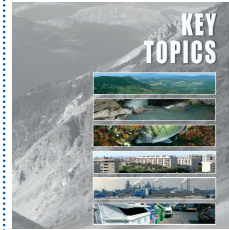


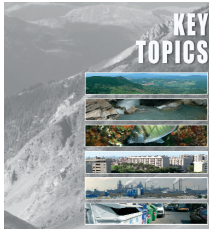
Figure II.14: Tourism intensity (2007)³²

The autonomous provinces of Bolzano (55.26) and Trento (28.64), together with the Aosta Valley (24.66) present the highest ratios of overnight stays/inhabitants.

Climate is one of the main driving factors behind the seasonal structure of tourist demand, determining its length and quality and playing a key role in the choice of the destination and decisions on how much to spend. In 2007 the peak season for tourist flows remained the third quarter (with 49% of overnight stays); another development of note was the decrease of 1.2 percentage points for the first quarter between 2006 and 2007. The distribution of the flows by category of tourist site (Figure II.15) shows that Italian tourists tend to favour seaside destinations (38%) and stays in hotels (61%). Foreign tourists, on the other hand, prefer cities and

The climate is one of the key driving factors behind the seasonal structure of tourist activity. In 2007, 49% of the overnight stays occurred in the third quarter.

³² Source: ISTAT data processed by ISPRA



Italians prefer seaside sites (38%), while foreigners favour cities of art and history (33%).

towns of historic and artistic interest (33.7%) and also favour staying in hotels (77%).

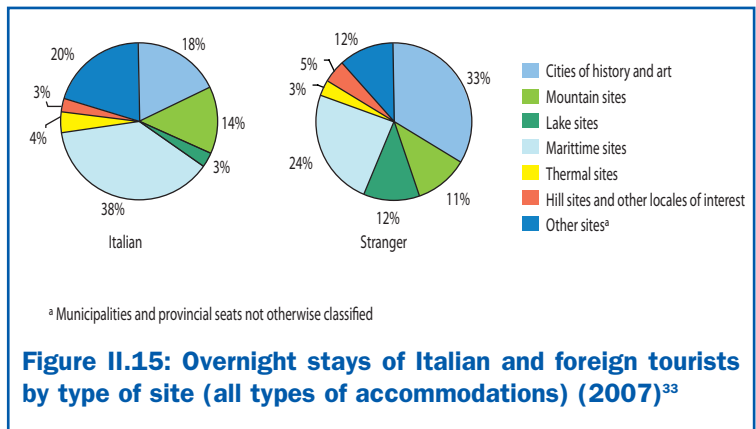


Figure II.15: Overnight stays of Italian and foreign tourists by type of site (all types of accommodations) (2007)³³

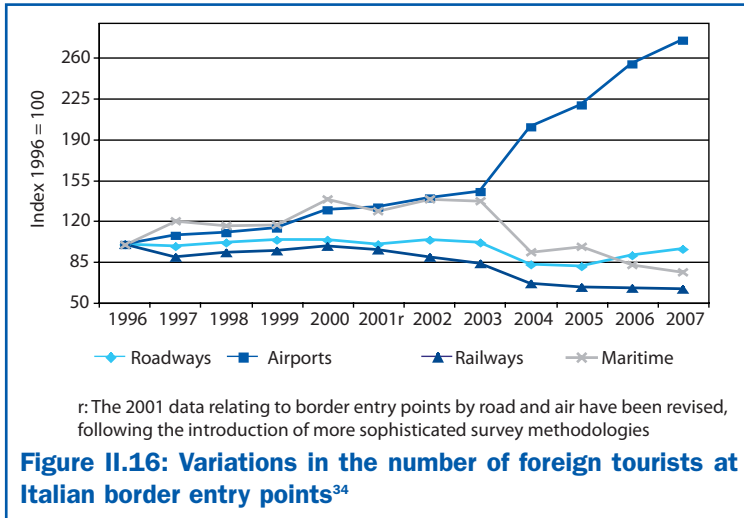
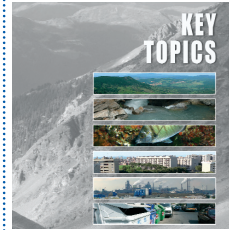
The favourite means of transport of Italians is the car (65.3%).

Of the total number of trips taken by Italians (roughly 11.2 million), roughly 65.3% are taken in cars. The tendency to travel by air is on the rise (14.5% of the trips), due in part to the increasingly economical and widespread services (low cost/low fare), together with the trend towards “short breaks”. As for the means of transport used by foreign tourists who come to Italy, “polluting” options continue to be favoured, such as the car and the airplane, which continued to grow between 2006 and 2007, at respective rates of 5.4% and 8% (Figure II.16).

Tourist places a variety of environmental pressures.

Tourism inevitably brings change with it; the yearning for environmental and cultural values, together with the desire for new experiences, can create disturbances in the balance of socio-environmental factors. Environmental pressures have a wide variety of effects, though a number of constants can be observed: elevated number of tourists, seasonal concentrations, use of the most polluting means of transport etc.. A characteristic typical of big cities is the fact that the problems normally caused by residents have been compounded by the role of the cities as extremely popular tourist destinations.

³³ Source: ISTAT data processed by ISPRA

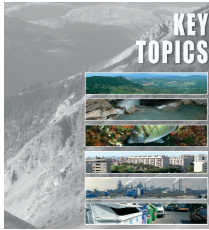


Choice of the most polluting means of transport, cars and airplanes, which rose by respective figures of 5.4% and 8% between 2006 and 2007.

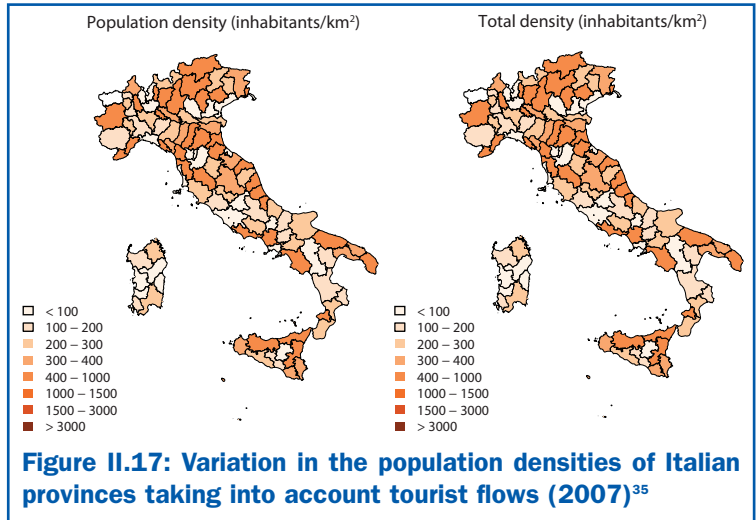
It should be noted that tourist flows significantly alter the residential density of certain Italian provinces. Under normal conditions (taking into account only the resident population), Florence, Venice, Rimini and Rome present respective population densities of 278, 342, 559, 755 inhabitants/km², while the arrival of tourists pushes these figures considerably higher. Rimini goes from 559 inhabitants/km² to 6,087 inhabitants/km² (population + tourist arrivals), making it the country's most densely populated province. The same type of jump takes place in Florence, whose resident population density is one a part with provinces such as Livorno, Lodi or Pescara, while the addition of the tourists raises the density (1,440 inhabitants/km²) to a level almost twice that of the resident population density of Rome (Figure II.17).

Tourist flows radically modify population density, as in the cases of Rimini and Florence, whose densities reach noteworthy levels with the addition of the tourists.

³⁴ Source: Bank of Italy data processed by ISPRA



The map on the left, showing the “Population density”, groups the Italian provinces into eight population density classes; the map on the right showing the “Total density”, groups the provinces into the same eight density classes, but also takes into account the total density, i.e. Resident (Population + Arrivals) /surface area in km²



³⁵ Source: ISTAT data processed by ISPRA