



ISPRA

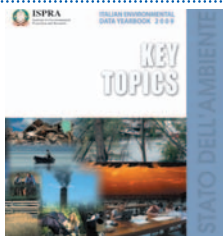
Institute for Environmental
Protection and Research

KEY TOPICS

Italian Environmental Data Yearbook

2009

ENVIRONMENTAL PROTECTION AGENCIES OF THE REGIONS
AND AUTONOMOUS PROVINCES



LEGAL INFORMATION

Neither the ISPRA (Institute for Environmental Protection and Research) nor the individuals who act on its behalf may be held responsible for the uses made of the information contained in this report.

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 (the former APAT), of the National Institute for Wildlife (the former INFS) and of the Central Institute for Scientific and Technological Research Applied to the Sea (the former ICRAM).

ISPRA – Institute for Environmental Protection and Research
State of Environment and Environmental Metrology Department
Environmental Statistics and Yearbook Project Service
Via Vitaliano Brancati, 48 - 00144 ROME
www.isprambiente.it

ISPRA, 2009

ISBN 978-88-448-0422-0

Reproduction authorised when the source is cited

Graphic treatment
ISPRA

Cover graphics: Franco Iozzoli, ISPRA
Cover photo: Paolo Orlandi, ISPRA

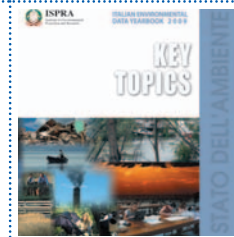
Typographic coordination:
Daria Mazzella
ISPRA – Publishing Department

Administration:
Olimpia Girolamo
ISPRA – Publishing Department

Distribution:
Michelina Porcarelli
ISPRA – Communication Service

Translation:
Parole S.a.s. di Alessandra Angelini
Via Vigna del Piano, 29 - 00060 Riano (RM)

Finished print in the month of July 2010
by Typolithography CSR - Via di Pietralata, 157 - 00158 Rome
Phone 064182113 (r.a.) - Fax 064506671



*“...namque alid ex alio clarescet nec tibi
caeca nox iter eripiet, quin ultima naturai
pervideas: ita res accendent lumina rebus ...”¹*

*Titi Lucretii Cari – De rerum natura
(Liber I, 1115-1117)*

¹ “...for one thing after other will grow clear, nor shall the blind night rob thee of the road, to hinder thy gaze on Nature’s farthest forth. Thus things for shall kindle torches new ...” (Translated by William Ellery Leonard)



STATO DELL'AMBIENTE



Foreword

I would like to express my great satisfaction for the 2009 edition of ISPRa Environmental Data Yearbook. It represents an important endeavour for disseminating environmental information which is a key mission of ISPRa.

There is also no doubt on the high expectations by decision-makers, operators, citizens and all those who consider environmental information as a fundamental tool of knowledge and participation.

For some time now, all planning and legislative initiatives of the European Union acknowledge the strategic role of information, both as a fundamental element of knowledge and as a tool for communication.

A solid and complete knowledge base is also being created to accompany decision making for one of the greatest European and global challenges: climate change and adaptation. As anticipated in the EU White Paper on this topic, a Clearing House Mechanism to improve information and knowledge sharing is being created on the impact of climate change, on vulnerability and on successful practices of adaptation.

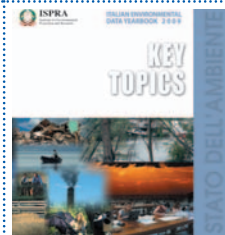
ISPRa's Yearbook also works in this direction, as underlined by our institution during the hearing held by the 8th Environmental Commission of the Italian Chamber of Deputies on the issue of adaptation to climate change.

I wish to thank all the experts who made this publication possible and I shall take it upon myself to ensure that the resources needed to carry out this important endeavour will be always available.

Prefect Vincenzo Grimaldi
ISPRa's Commissioner



STATO DELL'AMBIENTE



Introduction to the Environmental Data Yearbook

The Environmental Data Yearbook represents Italy's most complete collection of environmental data and information.

Born out of the environmental reporting experience of the former APAT, the Yearbook has expanded its information base through the valuable contributions of ICRAM and INFIS merged with APAT into ISPRA since 2008.

As always, a key factor in the successful preparation of the work was the sharing of environmental information between ISPRA and the other components of the national environment agencies system, i.e the environmental protection agencies of the Italian regions and of the autonomous provinces.

This year, ISPRA was once again aided by numerous technical-scientific institutions in drafting the various sections, as well as in data validation and information processing.

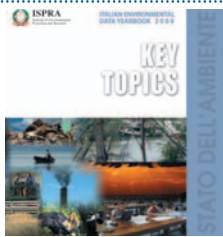
The important activity of revising the core-set of indicators, initiated in the last edition, was continued this year through the following procedures: validation of each indicator, based on the objectives set by national, European and international laws and regulations and by the corresponding reporting obligations and/or guidelines; assessment of the indicator's ability to represent the phenomenon being investigated; verification of the availability of the data needed to populate the indicator; evaluation of the scientific relevance and solidity of the indicator.

The indicator fact-sheets of the full version of the Yearbook provide a widely analytical and detailed information on the environmental topics addressed.

The overview that introduces the fact-sheets contains information on the indicators and on how they are represented in tables and figures. Starting from this year, the overview also provides information on the frequency of updates.

The structure of the fact-sheets (meta-data section), as compared to the format used in the Yearbook Database, was simplified by selecting the key information on the indicator.

This led to the exclusion of the following fields: Source of the Data, Frequency of Updates, Aim and Limits.



The Yearbook is structured in four sections: Introductory Elements, Production Sectors, Environmental Conditions and Responses.

The chapter on the socio-economic framework, first included in the 2008 edition, was updated and expanded, in order to provide a scenario as reliable as possible for interpreting the environmental information provided.

Under the section Production Sectors, the chapters Agriculture, Energy and Transportation were further rationalised, thanks also to the revision of the core-set of indicators.

A number of modifications were also made in the Environmental Conditions section. In particular, the contents of the chapters on the Biosphere and Hydrosphere were supplemented. Finally, the set of indicators for the Atmosphere chapter was expanded by including indicators on adaptation.

As for the chapter on Monitoring and Control, the activities of the ad hoc working group set up to draw up adequate indicators are continuing.

In keeping with ISPRRA's publishing strategy, the full version of the 2009 edition is produced in both paper and electronic formats (PDF available on CD-ROM and at the sites www.isprambiente.it and <http://annuario.apat.it>).

In addition to the full version of the Yearbook, the basic information is provided in the following four products:

- Key Topics – A version containing supplementary information on priority environmental issues, subject to specific prevention and reclamation;
- Vademecum – A short version (pocket) of the assessments contained in the preceding volume;
- Database – A tool for on-line consultation of the indicator fact-sheets and the production of reports;
- Multimedia – A tool for communicating the Yearbook data and information in a quick and easily understandable way through film sequences and web applications.

In the volume Key Topics (also available in English), the information base of the Yearbook is used to evaluate a number of situations related to key environmental policy concerns. Their choice was inspired by topics addressed by the EU's 6th Environmental Action Plan and by key 2009 events, such as the earthquake in L'Aquila, the landslide in Messina (Environmental Risk), the problems of algae (Coastal Environment) and waste. Particular consideration was given to Climate Change and Biodiversity,



both central to the 2009 Environment G8 in Siracusa and continuing to remain at the forefront of international policy debate as for 2009. Copenhagen Summit and the 2010 Year of Biodiversity.

The same key topics are dealt in a summarised form in the Vademecum (also available in English),

The Database of the Yearbook, together with the Full Version, allow for a deeper examination of the topics.

A new release of the database has been created, in order to improve the operating performance, rationalising the processing of the indicators and facilitating the consultation of the information collected. Of particular note are the improvements made to the report editing phase, through a smoother management of the xls files, plus a much more extensive, well stocked section of .pdf files.

The information base of ISPRa's Environmental Data Yearbook also constitutes the backbone for other important publications. These include the document "Le sfide ambientali" ("Environmental Challenges"), issued by the Ministry of the Environment, Land and Sea, and the European Environment State and Outlook Report 2010 (SOER 2010), drawn up by the European Environment Agency.

It is hoped that the different publications originating from the information base provided by ISPRa will make a tangible contribution to the dissemination of environmental information and to the raising of environmental awareness among an ever broader group of users, policy-makers, researchers and citizens alike. Progress towards more sustainable forms of human development on our planet is possible only through informed decisions by all citizens, based on their full understanding of the environmental consequences of consumption and production patterns.

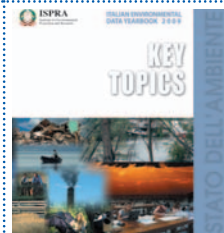
ISPRa's intense activity on environmental information contributes to the technical and -scientific groundwork needed to develop such understanding.

Mr. Roberto CARACCILO
Director of ISPRa's State of the
Environment and Metrology Department



STATO DELL'AMBIENTE

Contributors and Thanks



General considerations

In carrying out one of its most important institutional functions, namely the coordination, collection and distribution of environmental information and reporting, ISPRA constantly procures and maintains a significant supply of top-quality knowledge, translating it into thematic and inter-thematic reports, such as the Environmental Data Yearbook, which, now in its eighth edition, is drawn on by a vast range of users.

Compared to the other publications, the Yearbook, give 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.

New features include an expansion of the information contents, beyond the topics already dealt with, through the addition of the valuable contributions of the former ICRAM and INFS institutes, which have become a part of ISPRA.

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 analysts responsible for the reporting.

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;*
- *Monitoring of Environmental Quality, Prevention and Mitigation of Impact, Defence of Habitats and Biodiversity, formerly carried out by ICRAM and INFS.*

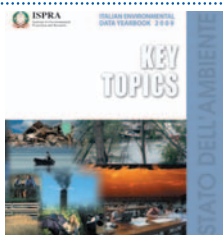
Equally important were the contributions of the ARPA/APPA agencies, plus the numerous technical-scientific bodies.

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, both units that were formerly part of the APAT.

Specific contributions to the document Key Topics

I. Purposes and structure of the document

Author: Luca SEGAZZI



II. Socio Economic Framework

Coordinator: Mariaconcetta GIUNTA

Authors: Giovanni FINOCCHIARO, Cristina FRIZZA, Alessandra GALOSI, Silvia IACCARINO, Luca SEGAZZI, Paola SESTILI

Chapter 1. Climate Change

Coordinator: Domenico GAUDIOSO, assisted by Alessandra GALOSI

Authors: Antonio CAPUTO, Franco DESIATO, Aldo FEMIA (ISTAT), Domenico GAUDIOSO, Francesca GIORDANO, Renato MARRA CAMPANALE, Andrea TORETI

Contributors:

Mario CONTALDI, Giulia IORIO (ENEA), Piero LEONE (TERNA), Claudio PICCINI

Chapter 2. Biodiversity and Natural, Agricultural and Forest Areas

Coordinators: Claudio PICCINI (general coordination), Lorenzo CICCARESE (coordination for agricultural and forest areas), with the assistance of Giovanni FINOCCHIARO

Authors: Sabrina AGNESI, Anna ALONZI, Pierangela ANGELINI, Antonella ARCANGELI, Valter BELLUCCI, Roberta CAPOGROSSI, Lorenzo CICCARESE, Rocio CONDOR, Massimo DALU', Taira DI NORA, Stefania ERCOLE, Dania ESPOSITO, Giovanni FINOCCHIARO, Diego FLORIAN (FSC), Vanna FORCONI, Piero GENOVESI, Valeria GIOVANNELLI, Michela GORI, Matteo GUCCIONE, Mario GUIDO (ISMEA), Lucilla LAURETI, Stefano LUCCI, Maria Cecilia NATALIA, Emanuela PACE, Pietro PARIS, Claudio PICCINI, Roberto SANNINO, Paola SESTILI, Leonardo TUNESI

Chapter 3. Air Quality

Coordinator: Anna Maria CARICCHIA, assisted by Silvia IACCARINO

Authors: Patrizia BONANNI, Anna Maria CARICCHIA, Giorgio CATTANI, Mario CONTALDI, Maria Carmela CUSANO, Roberto DAFFINÀ, Riccardo DE LAURETIS, Alessandro DI MENNO di BUCCHIANICO, Alessandra GAETA, Giuseppe GANDOLFO, Cristina SARTI

Contributors:

Antonella BERNETTI, Antonio CAPUTO, Rocio CONDOR, Eleonora DI CRISTOFARO, Andrea GAGNA, Barbara GONELLA, Daniela ROMANO, Ernesto TAURINO, Marina VITULLO

Chapter 4. Water Quality

Coordinator: Ardiana DONATI, assisted by Silvia IACCARINO

Authors: Ardiana DONATI, Silvia IACCARINO, Marco MARCACCIO (ARPA Emilia Romagna), Paolo NEGRI (APPA Trent), Massimo PALEARI (ARPA Lombardy)

Contributors:

Ottavia BARISIELLO, Serena BERNABEI, Michele BOLDIZZONI, Francesca DE GIACOMETTI, Giancarlo DE GIRONIMO, Patrizia FIORLETTI, Emanuela PACE, Simona RAMBERTI (ISTAT), Silvana SALVATI, Stefano TERSIGNI (ISTAT)

Focus Coordinator: Anna Maria CICERO and Erika MAGALETTI (*Coastal Marine Waters*), Ardiana DONATI (*Inland Waters*), assisted by Silvia IACCARINO



Authors (*Focus and case study inland waters*): Fedra CHARAVGIS (ARPA Umbria), Alessandra CINGOLANI (ARPA Umbria), Ardiana DONATI, Silvia IACCARINO, Angiolo MARTINELLI, (ARPA Umbria), Alessandra SANTUCCI (ARPA Umbria)

Authors (*Focus and case study coastal marine waters*): Tiziano BACCI, Andrea BONOMETTO, Rossella BOSCOLO, Federica CACCIATORE, Anna Maria CICERO, Paola GENNARO, Franco GIOVANARDI, Silvia IACCARINO, Erika MAGALETTI, Chiara MAGGI, Marina PENNA, Benedetta TRABUCCO

Chapter 5. Exposure to Physical Agents

Coordinators: Salvatore CURCURUTO (*Noise, Non-Ionising Radiation and Ultraviolet Radiation*), Giancarlo TORRI (*Ionising Radiation*), assisted by Cristina FRIZZA and Matteo SALOMONE

Authors of *Noise, Non-Ionising Radiation and Ultraviolet Radiation*: Salvatore CURCURUTO, Cristina FRIZZA, Maria LOGORELLI, Celine NDONG, Francesca SACCHETTI, Rosalba SILVAGGIO, Roberto SPAMPINATO, Luisa VACCARO

Authors for *Ionising Radiation*: Sonia FONTANI, Valeria INNOCENZI, Giuseppe MENNA, Francesca SALVI, Anna Maria SOTGIU, Giancarlo TORRI

Chapter 6. Environment and Health

Coordinator: Luciana SINISI, assisted by Cristina FRIZZA

Authors: Francesca DE MAIO, Sabrina RIETI, Luciana SINISI, Jessica TUSCANO

Contributors:

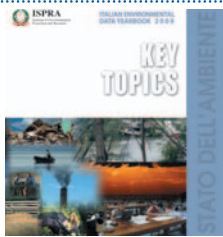
Giorgio BARTOLINI (CIBIC), Veronica BEGLIOMINI (ARPA Tuscany), Tommaso BIANCHI (ARPA Tuscany), Valentina BIGAGLI (ARPA Tuscany), Monica Francesca BLASI (ISS), Paola BOTTONI (ISS), Giovanni BRACA, Martina BUSSETTINI, Mario CARERE (ISS), Lorenzo CECCHI (CIBIC), Annamaria DE MARTINO (Ministry of Health), Benedetta DELL'ANNO (Ministry of the Environment, Land and Sea), Valentina DELLA BELLA (ISS), Maria Paola DOMENEGHETTI (ARPA Tuscany), Anna Maria FAUSTO (University of the Tuscia), Giancarlo MAJORI (ISS), Laura MANCINI (ISS), Stefania MARCHEGGIANI (ISS), Angiolo MARTINELLI (ARPA Umbria), Marzia ONORARI (ARPA Tuscany), Simone ORLANDINI (CIBIC), Valter RAINERI (ARPA Liguria), Roberto ROMI (ISS), Danila SCALA (ARPA Tuscany), Daniele SPIZZICHINO, Tommaso TORRIGIANI MALASPINA (CIBIC), Franco VANNUCCI (Local Board of Health 3 of Pistoia)

Chapter 7. Environmental Risk

Coordinators: Eutizio VITTORI (*Natural Risk*) and Alberto RICCHIUTI (*Anthropogenic Risk*), assisted by Alfredo LOTTI (*Anthropogenic Risk*), Luca SEGAZZI and Giorgio VIZZINI (*Natural Risk*)

Authors of *Natural Risk*: Anna Maria BLUMETTI, Stefano CALCATERRA, Valerio COMERCI, Piera GAMBINO, Carla IADANZA, Mauro LUCARINI, Alessandro TRIGILA, Eutizio VITTORI, Giorgio VIZZINI

Authors of *Anthropogenic Risk*: Francesco ASTORRI, Alfredo LOTTI, Alberto RICCHIUTI



Chapter 8. Soil and Land

Coordinator: Fiorenzo FUMANTI, assisted by Alessandra MUCCI and Paola SESTILI

Authors: Marco DI LEGINIO, Fiorenzo FUMANTI, Anna LUISE

Contributors:

Federico ARANEO, Eugenia BARTOLUCCI, Riccardo BOSCHETTO, Carlo DACQUINO, Laura D'APRILE, Andrea DI FABBIO, Maria Cristina GIOVAGNOLI, Carlo JACOMINI, Michele MUNAFÒ, Fabio PASCARELLA, Francesca QUERCIA, Irene RISCHIA, Lycia ROMANO, Luca SALVATI, Antonella VECCHIO

Chapter 9. Coastal Areas

Coordinator: Stefano CORSINI, assisted by Silvia IACCARINO

Authors: Angela BARBANO, Patrizia BORRELLO, Stefano CORSINI, Roberta DE ANGELIS, Paola LA VALLE, Luisa NICOLETTI, Daniela PAGANELLI, Elena PALLOTTINI, Massimo SCOPELLITI (Ministry of the Environment, Land and Sea), Laura SINAPI, Emanuela SPADA

Chapter 10. The Waste Cycle

Coordinator: Rosanna LARAIA, assisted by Cristina FRIZZA

Authors: Gabriella ARAGONA, Andrea Massimiliano LANZ, Rosanna LARAIA

Contributors:

Letteria ADELLA, Valeria FRITTELLONI, Fabrizio LEPIDI, Antonio MANGIOLFI, Andrea PAINA, Elisa RASO, Angelo SANTINI

Chapter 11. Instruments for Environmental Knowledge and Awareness and Interfacing with the Market

Coordinators Rita CALICCHIA (*Dissemination of Environmental Information*), Luigi CAIONI and Stefania MINISTRINI (*Instruments for Improving Environmental Services*), Adolfo PIROZZI (*Dissemination of Environmental Information, Environmental Education and Training Programmes*), assisted by Paola SESTILI

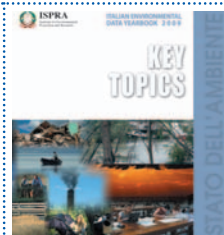
Authors of *Dissemination of Environmental Information*: Maria Alessia ALESSANDRO, Simona BENEDETTI, Rita CALICCHIA, Fabrizio CIOCCA, Alessandra GALOSI, Daniela GENTA, Anna Laura SASO, Filomena SEVERINO

Authors of *Environmental Education and Training Programmes*: Daniela ANTONIETTI, Silvia BONAVENTURA, Stefania CALICCHIA, Alessandra CASALI, Claudio LA ROSA, Patrizia POLIDORI

Authors of *Instruments for Improving Environmental Services*: Gianluca CESAREI, Mara D'AMICO, Rossella GAFÀ, Stefania MINISTRINI, Valeria TROPEA

Annex –Yearbook Indicators Database

Authors: Raffaele MORELLI, Matteo SALOMONE



Editing

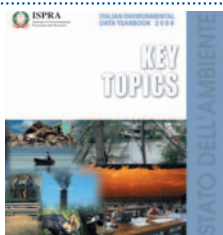
The phases of the editing of the Yearbook products were handled by a workgroup coordinated by Mariaconcetta GIUNTA and consisting of: Giovanni FINOCCHIARO (processing and statistical validation of the data), Cristina FRIZZA (processing and statistical validation of the data), Alessandra GALOSI (processing and statistical validation of the data), Silvia IACCARINO (coordination of the fact-sheets and technical revision), Alessandra MUCCI (revision and editing of texts), Matteo SALOMONE (processing and statistical validation of data, plus multimedia processing), Luca SEGAZZI (technical revision and processing and statistical validation of data), Paola SESTILI (contact for the processing and statistical validation of data). The Databank 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 Indicators Database, as well as the integration of the contents of the work, the processing and statistical control 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

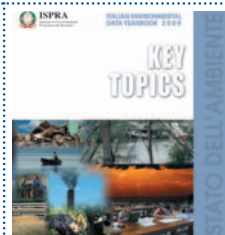
The work involved in the preparation of the information contents of the “Environmental Data Yearbook” was carried out by a Task Force coordinated by Mariaconcetta GIUNTA. In the interests of updating the indicators found in the Yearbook Indicators Database for each environmental topic, the following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

former APAT

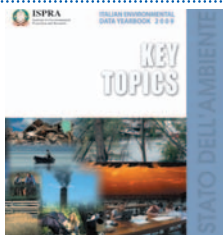
Environmental Topics	Topic Coordinator	Department Service/Sector	Statistical Coordinator
Guide to the Yearbook	Mariaconcetta GIUNTA	AMB-ASA	
Spatial coverage of the indicators	Mariaconcetta GIUNTA	AMB-ASA	
Socio Economic framework	Mariaconcetta GIUNTA	AMB-ASA	
AGRICULTURE and FORESTRY	Lorenzo CICCARESE Stefano LUCCI	NAT-SOS	Luca SEGAZZI
ENERGY	Domenico GAUDIOSO	AMB-MPA	Alessandra GALOSI
TRANSPORT	Mario CONTALDI (Emissions and Technology) Roberta PIGNATELLI (Socioeconomics and the Environment)	AMB-MPA AMB-RAS	Paola SESTILI



Environmental Topics	Topic Coordinator	Department Service/Sector	Statistical Coordinator
TOURISM	Silvia IACCARINO	AMB-ASA	Luca SEGAZZI
INDUSTRY	Antonino LETIZIA	ISP	Luca SEGAZZI
ATMOSPHERE	Riccardo DE LAURETIS (Emissions) Anna Maria CARICCHIA (Air Quality) Franco DESIATO (Climate)	AMB-MPA	Alessandra GALOSI Cristina FRIZZA
BIOSPHERE	Claudio PICCINI	NAT-BIO	Giovanni FINOCCHIARO
HYDROSPHERE	Angela BARBANO (Coasts) Maria CAROTENUTO (WISE) Marco CORDELLA (the Venice Lagoon) Ardiana DONATI (Inland Waters) Gabriele NARDONE (Physical State of the Sea)	ACQ-COS ACQ-DAT ACQ-VEN ACQ-MON ACQ-MAR	Silvia IACCARINO
GEOSPHERE	Fioenzo FUMANTI, in collaboration with Andrea DI FABBIO and Marco DI LEGINIO, and with assistance from Anna LUISE (Desertification)	SUO-IST AMB	Paola SESTILI Alessandra MUCCI
WASTE	Rosanna LARAIA assisted by Andrea LANZ	AMB-RIF	Cristina FRIZZA
IONISING RADIATION	Giancarlo TORRI, assisted by Sonia FONTANI and Giuseppe MENNA	RIS-LAB RIS-RDP	Silvia IACCARINO
NON-IONISING RADIATION	Salvatore CURCURUTO	AMB-AGF	Matteo SALOMONE
NOISE	Salvatore CURCURUTO	AMB-AGF	Cristina FRIZZA



Environmental Topics	Topic Coordinator	Department Service/Sector	Statistical Coordinator
NATURAL RISK	Eutizio VITTORI, assisted by Giorgio VIZZINI	SUO-RIS SUO-IST	Giovanni FINOCCHIARO
ANTHROPOGENIC RISK	Alberto RICCHIUTI, Alfredo LOTTI, assisted by Francesco ASTORRI (Industrial Risk) Leonardo ARRU, assisted by Laura D'APRILE (Contaminated Sites)	RIS-IND EME	Luca SEGAZZI
ENVIRONMENTAL EVALUATION AND CERTIFICATION	Luigi CAIONI (EMAS) Stefania MINISTRINI (Ecolabel) Maria BELVISI (EIA)	CER AMB-OAM	Silvia IACCARINO
MONITORING and CONTROL	Maria BELLI, assisted by Maria Gabriella SIMEONE (Monitoring) Antonino LETIZIA (Control)	AMB-LAB ISP	Paola SESTILI Alessandra MUCCI
PROMOTION and DISSEMINATION of ENVIRONMENTAL CULTURE	Adolfo PIROZZI Rita CALICCHIA (Environmental Information)	BIB-FOR AMB-RAS	Matteo SALOMONE
ENVIRONMENTAL PLANNING INSTRUMENTS	Patrizia FIORLETTI (SEA) Patrizia BONANNI (Air) Angela BARBANO (Coasts) Ardiana DONATI (Waters) Salvatore CURCURUTO (Noise) Eutizio VITTORI (Natural Risk) Claudio PICCINI (Biosphere)	AMB-VAL AMB-MPA ACQ-COS ACQ-MON AMB-AGF SUO-RIS NAT-BIO	Cristina FRIZZA
ENVIRONMENT and HEALTH	Luciana SINISI	AMB-VAL	Cristina FRIZZA



Former ICRAM

Department II, “Prevention and Mitigation of Impacts”, provided additional information on contaminated sites and on the topic of the hydrosphere (Coasts). Elena ROMANO (Contaminated Sites) and Luisa NICOLETTI (Coasts) worked with the topic coordinators.

Department III, “Defence of Habitats and Biodiversity”, provided further information on Protected Marine Areas and Protected Species (marine). The Department Director, assisted by Sabrina AGNESI, Taira DI NORA and Giulia MO, worked with the coordinator of the biosphere topic.

Former INFS

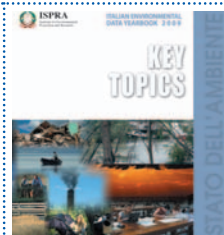
Piero GENOVESI served as the liaison with the other members of the task force, focussing attention on providing further information on the Biosphere environmental topic.

Contacts were also identified for the phases of implementation not directly connected with the information contents of the Yearbook, as shown below:

Connected Activities	Topic Coordinator	Department Service/Sector	Statistical Coordinator
ISPRA website	Franco GUIDUCCI	BIB-WEB	Matteo SALOMONE
SINAnet databases	Michele MUNAFÒ	AMB-NET	
Printing	Renata MONTESANTI Daria MAZZELLA	DIR-COM	Matteo SALOMONE
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



Departments/Inter-Departmental Services of the former APAT	SYMBOL
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
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
SINANET Service	AMB/NET
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
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

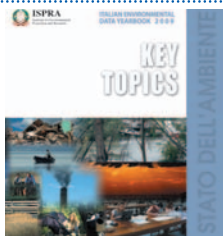
Authors of information contents

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.

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), Antonio Nicolò CORRAINE (ARPA Sardinia), Chiara DEFRANCESCO (ARPA Trent), 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), Anna Maria MATRONE (ARPA Campania), Luca MENINI (ARPA Veneto), Luigi MINACH (ARPA Bolzano), Pina NAPPI (ARPA Piedmont), Paolo Michele RICCI (ARPA Molise), Stefano ROSSI (ARPA Tuscany), Vincenzo SORRENTI (ARPA Calabria), Stefano SPAGNOLO (ARPA Apulia), Paolo STRANIERI (ARPA Umbria).

Other contributions from the ISPRa technical units

Other specific *technical contributions* were made by 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.

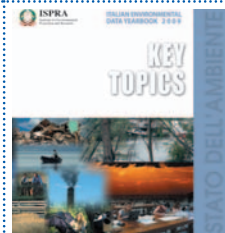
Further specific *technical contributions* were provided by the former ICRAM, including:

- for topics regarding the *Biosphere*, from Department III, “Defence of Habitats and Biodiversity”;
- for topics regarding the *Hydrosphere*, from Department II, “Prevention and Mitigation of Impacts”, and from Department I, “Monitoring of Environmental Quality”

Specific *technical contributions* were also provided by the former INFS, 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: Mariaconcetta 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.

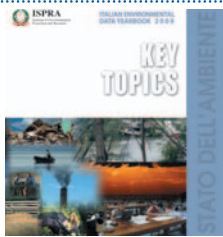
Contributions by subjects outside of the Agency System

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, TELETLAS, TERNA and IREPA.

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 enacted 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), Guido BENASSAI (University of Naples), Gianfranco BOLOGNA (WWF Italy), Giovanni BRAMBILLA (IA CNR), Fabrizio BULGARINI (WWF Italy), Anna Maria DE MARTINO (Ministry of Labour, Health and Social Policies), Vincenzo FERRARA (ENEA), Alessandro Maria MICHETTI (University of Insubria - Como), Romano PAGNOTTA (IRSA CNR), Alessandro POLICHETTI (ISS), Sabina PORFIDO (IAMC CNR), Giuseppe RANDAZZO (University of Messina), Rachele SCHETTINI (Chairwoman EUROPA 2010), Anna Maria SIANI (University of Rome, La Sapienza Campus), Paolo VECCHIA (ISS), Giuseppe VIVIANO (ISS).

Thanks

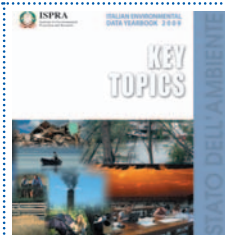
Heartfelt thanks are once again expressed to those whose contributions have made publication of the 2009 edition of the Yearbook possible.

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.

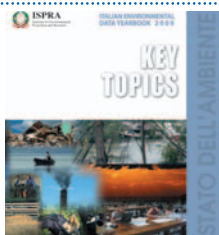
These thanks go to everyone, including those who, though they contributed, are not explicitly mentioned. A few names may have been left out by mistake. We ask these people to accept our most sincere apology.

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.

CONTENTS

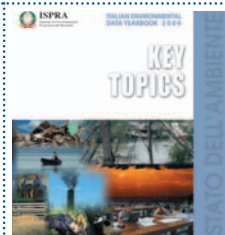


Foreword	V
Introduction to the Environmental Data Yearbook	VII
Contributions and Thanks	XI
Contents	XXIII
I Purposes and Structure of the Document	XXV
II Socio Economic Framework	XXVII
1 Climate Change	1
2 Biodiversity and Natural, Agricultural and Forest Areas	55
3 Air Quality	95
4 Water Quality	127
<i>Focus: First application of Directive 2000/60/EC</i> <i>to surface waters</i>	150
<i>Case study: Experimental monitoring of surface waters in the region</i> <i>of Umbria (2008/2009)</i>	169
<i>Case study: Characterisation of the Venice lagoon and identification</i> <i>of water bodies</i>	177
5 Exposure to Physical Agents	183
<i>Noise</i>	186
<i>Non-Ionising Radiation</i>	198
<i>Ultraviolet Radiation</i>	206
<i>Ionising Radiation</i>	222
6 Environment and Health	229
<i>Prevention in a changing world: the determinants of</i> <i>health and environmental strategies of adaptation</i>	230
7 Environmental Risk	259
<i>Natural Risk</i>	260
<i>Anthropogenic Risk</i>	293
8 Soil and Land	301
9 Coastal Areas	343
10 The Waste Cycle	381



11	Instruments for Environmental Knowledge and Awareness and Interface with the Market	397
	<i>Dissemination of environmental information</i>	403
	<i>Environmental education and training Programmes</i>	412
	<i>Instruments for improving environmental services</i>	417
	Acronyms	423
	Annex –Yearbook Indicators Database	433

I. Purposes and Structure of the Document



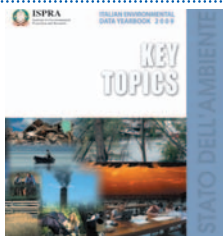
Purposes

This document is meant to provide a sufficiently thorough description of the underlying context for the environmental topics currently given priority in the formulation of environmental policy, 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.

To ensure that the contents are suited to the widest possible audience, 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.

Among the topics examined, special attention is placed on: *climate change*, *natural risk* (earthquakes, landslides and floods), *the marine coastal environment* (dune, banks of Posidonia, water quality for swimming and marine algae) and *biodiversity*, seeing that these were the issues focussed on by public opinion, together with national and international institutions, in the year 2009.

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 the application of the new regulations for monitoring internal waters and marine coastal waters.

There are three different ways of reading the various chapters: the text provides the reader with a complete and exhaustive analysis of the topics; the “focuses” in the margins make easier the 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 appendix provides a description of the structure and function of the Yearbook Database, a computerised instrument for managing the indicator fact-sheets that contain the Institute’s store of environmental information.

II. Socio Economic Framework

Characteristics of Italy

Italy is a peninsula located in southern Europe, with a territory that includes the Alpine mountain chain and numerous islands, the largest of which are Sicily and Sardinia, while the smaller islands are about 70.

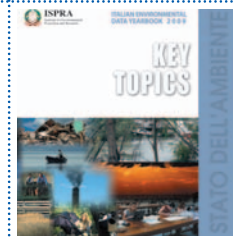
The environmental features of Italian territory, and the Mediterranean climate in particular (dry and seasonably hot) are similar to those of other Mediterranean countries, such as Spain, Portugal and Greece. Italy has a total territorial surface of 301,336 km². The territory consists primarily of hilly and mountainous zones (accounting for 41.6% and 35.2% of the total respectively), plus a lengthy coastline (8,353 km). These features ensure a territory with a wide variety of landscapes.

Climate conditions are generally temperate, with regional variations. In summer, the northern regions are hot, with occasional rain, the central regions are humid, and the south scorches under the dry heat. In winter the northern cities undergo cold temperatures, noteworthy humidity and fog, while temperatures in the south are more comfortable (10-20°C).

The specific location of Italian territory within the Mediterranean geodynamic context (convergence of the European and African plates, interposition of the Adriatic micro-plate, opening of the Tyrrhenian basin) makes Italy one of the countries at greatest risk for earthquakes and volcanoes.

The areas at greatest risk for earthquakes are the Friuli sector, the central-southern Apennine mountain chain, and especially the sectors of the intra-Apennine basin, as well as along the Tyrrhenian coast of Calabria and in southeast Sicily. The highest volcanic risk is naturally tied to the presence of Italy's active volcanoes, meaning in the Vesuvius and Phlegrean area, on the Island of Ischia, in and around Etna volcano, on the Aeolian Islands and, in part, in the Alban Hills.

Italy is one of Europe's countries, in terms of biodiversity, essentially on account of its favourable geographic position as well as its extensive geo-morphological, microclimatic features and vegetative variety, plus the additional influence of factors of history and culture factors. Italy contains one half of all the plants species and a third of the animal species currently found in European territory.

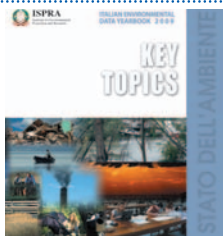


Italian territory consists of hilly and mountainous zones, plus a lengthy coastline, ensuring a wide variety of landscapes.

The climate in Italy is generally temperate, with regional variations.

Due to its position, Italy is one of the countries at greatest risk for earthquakes and volcanoes in the Mediterranean area.

Italy is one of the European countries with the richest supply of biodiversity.



Italy is one of the most densely populated countries in Europe.

Compared to the rest of Europe, Italy's enterprises are more geared towards manufacturing activities, creating what is referred to as the "made in Italy" sector.

The last 60 years have been characterised by a sharp drop in the birth rate and a gradual ageing of the population, together with increased immigration.

At the end of 2008, Italy's population numbered more than 60 million. As has been the case for a number of years now, any growth is due almost exclusively to the arrival of immigrants. The average population density in Italy is approximately 200 inhabitants per square kilometre.

Levels of population density higher than the national average tend to be registered by smaller towns, especially in the southern regions and on Italy's islands, where peaks of more than 900 inhabitants per square kilometre can be found.

Seen within the context of the European Union, Italy is one of the most densely populated states. The majority of the Italian population lives in lowland areas.

Thanks to its lengthy history of urban development, Italy is one of the countries with the greatest wealth of cultural resources and monuments (42 Italian cultural sites are included on the UNESCO World Heritage list).

Looking at Italy's production structure, service enterprises are prevalent in the central regions, while the micro-enterprises are predominant in the South, and medium-size enterprises are the most widespread in the northeast regions. In the northwest, on the other hand, large-scale industry plays the leading role.

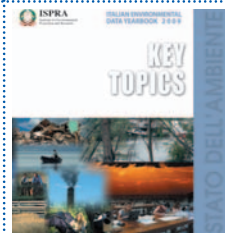
Compared to the rest of Europe, a higher percentage of our companies are involved in manufacturing activities (despite a late-arriving but rapid development of service industries), with a relative specialisation in the sub-sectors that can be referred to under the category of "Made in Italy" products.

II.1 Key developments in Italian society

During the last 60 years, major socioeconomic transformations have occurred in Italy: from a poor society based on agriculture, it has become an advanced post-industrial society.

In accordance with the reference framework, the structure of the Italian population has also changed, in terms of inhabitants and forms of behaviour, going from 47 million inhabitants in the 50's to 60 million at present.

This period was characterised by a sharp drop in the birth rate



and by the gradual ageing of the population, along with increased immigration.

After a period of relatively stable growth of the Italian economy in the years following the Second World War (1945-1950), the population rose at an astonishing pace, reaching annual growth rates of 1%, especially in urban and suburban areas.

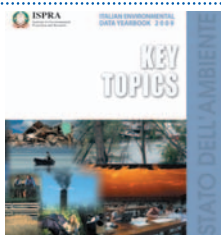
The years between 1958 and 1963 came to be known as those of “Italy’s Economic Miracle”, though it should be noted that economic development noteworthy regional differences, especially between the Centre-North and the South.

Potentially better job prospects in urban areas were the primary cause of the intensive exodus from countryside to the cities, drawing flows of internal immigrants from the Alpine hinterland and the Apennine hills, as well as Sicily and Calabria, in the direction of Rome, Milan, Turin and Genoa. This exodus towards industrial areas still exists, though it has slowed, due to the current depressed state of the economy.

In 1970, the Italian population numbered approximately 54 million inhabitants, of whom approximately 4 million worked in agriculture (20.1% of the total workforce), while more than 8 million were employed in the service industries (41.5%) and approximately 7.6 million in the industrial sector (38.4%), making for a total active workforce of roughly 20 million. Between 1970 and 2008, the population grew by approximately 6 million inhabitants (+11%), with an equally significant change in the distribution of the workforce among the various categories of employment: the total number of actively employed inhabitants rose by slightly more than 5.5 million (+27%); there was a drop of 992,000 in the number employed in agriculture (-75%), while the number in the service industries rose above the 17 million mark (+107.7%), and the number in the industrial sector fell slightly below 7 million (-7.1%).

The years of the “Italian Economic Miracle” widened the gap between the Central-North regions and the South.

Between 1970 and 2008 the Italian population grew by 11% and the structure of the country’s workforce changed significantly, with the emphasis on farming and industry shifting in favour of the service industries.



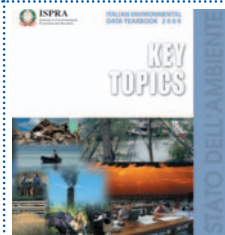
Between 1970 and the present, the structure of the Italian workforce changed significantly, with the emphasis on farming and industry shifting in favour of the service industries.

Table II.1: Total employed¹					
Economic activities	1970	1980	1990	2000	2008
	figures in the 1,000's				
Agriculture, forestry and fishing	4,008.2	2,856.6	1,689.9	1,102.9	991.7
Industry in the strict sense	5,689.7	6,429.1	5,820.1	5,189.5	5,179.1
Construction	1,970.4	1,709.9	1,511.4	1,553.9	1,938.1
Trade repairs, hotels and hotels and restaurants, transport and communications	3,932.4	4,742.8	5,561.2	5,631.7	6,175.0
Monetary and financial intermediation; real estate and business activities	707.7	1,068.8	2,091.8	2,949.8	3,783.7
Other service activities	3,623.0	4,565.8	5,935.1	6,502.3	7,195.3
TOTAL	19,931.4	21,373.0	22,609.5	22,930.1	25,262.9
Economic activities	1970	1980	1990	2000	2008
	%				
Agriculture, forestry and fishing	20.1	13.4	7.5	4.8	3.9
Industry in the strict sense	28.5	30.1	25.7	22.6	20.5
Construction	9.9	8.0	6.7	6.8	7.7
Trade repairs, hotels and hotels and restaurants, transport and communications	19.7	22.2	24.6	24.6	24.4
Monetary and financial intermediation; real estate and business activities	3.6	5.0	9.3	12.9	15.0
Other service activities	18.2	21.4	26.3	28.4	28.5
TOTAL	100.0	100.0	100.0	100.0	100.0

II.2 The main driving forces and the resulting environmental pressures and impacts

The distinguishing characteristics of the country's territorial and socio-economic framework, and especially the demographic dynamics and the models of behaviour of economic subjects (families and businesses), are closely connected with the anthropogenic pressures that threaten the national environment (air pollution, water, soil and nature, waste generation, consumption and deterioration of natural resources).

¹ Source: ISTAT data processed by ISPRA



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 causes of pressures on the environment in terms of consumption, waste generation, 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.

During 2008, Italy's resident population rose above the threshold of 60 million inhabitants. As of 31 December 2008, the total was 60,045,068² inhabitants, for an increase of 425,778 over the same date in 2007, determined exclusively by the arrival of immigrants from abroad. The population increase presents regional differences, as a result of contrasting dynamics that channel the majority of the migratory, both internal and from abroad, towards the regions of northern and central Italy, while the balance of natural population growth is positive in Southern Italy (including islands). 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 individuals found in a given territory are one of the main sources of pressure on the environment.

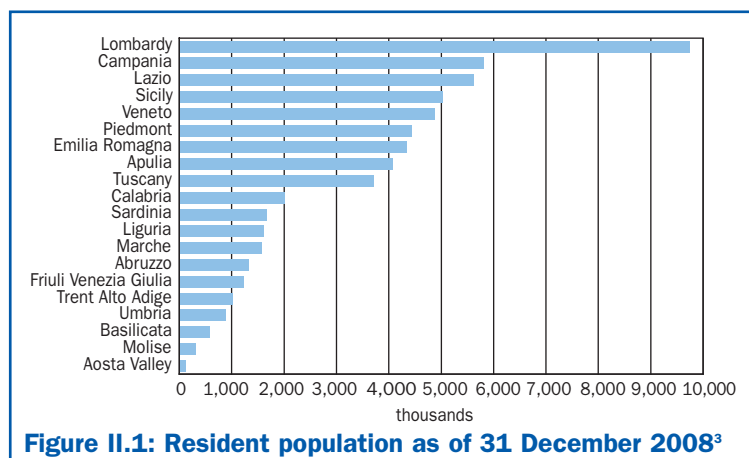
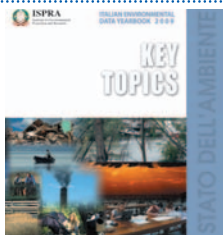


Figure II.1: Resident population as of 31 December 2008³

During 2008 Italy's resident population rose above the threshold of 60 million inhabitants.

² Source: ISTAT (for all the data indicated in this section)

³ Source: ISTAT data processed by ISPRA



Within Europe as a whole, Italy is one of the most densely populated countries. The most densely populated Italian regions, at respective levels of 428 and 404 inhabitants per km², are Campania and Lombardy.

Spending on food and beverages accounts for 19.1% of total monthly family spending.

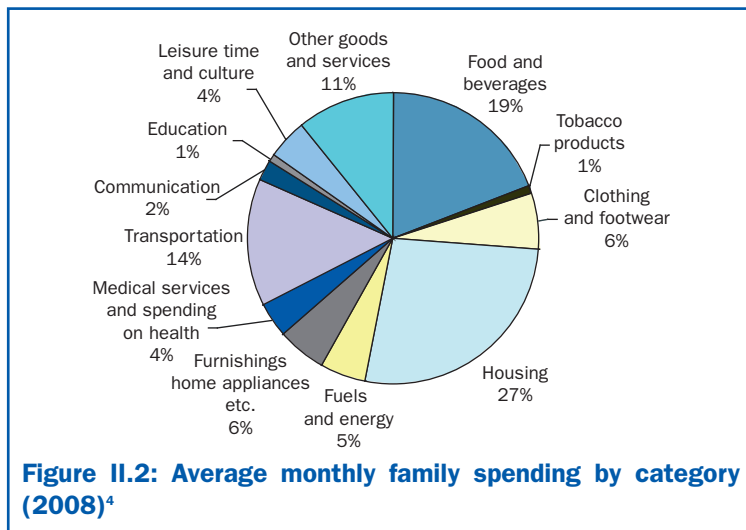
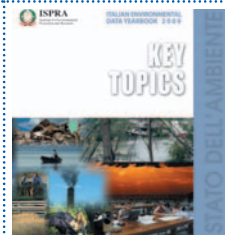
Compared to 2007, levels of spending for healthcare, transportation, leisure-time and cultural activities, as well as clothing and footwear, furnishings, home appliances and home services, all fell.

The most heavily populated region, with more than 9.7 million residents, is Lombardy, followed by Campania (over 5.8 million) and Lazio (over 5.6). The regions with the largest surface area, on the other hand, are Sicily, Piedmont and Sardinia, with Lombardy in fourth place.

Breaking down the population by age, 20.1% are individuals aged 65 or older, 14% are young people up to the age of 14, and 65.9% of the population is in active age group, meaning the 15 to 64 year-old segment.

Consumption patterns also reflect demographic changes, with variations in family size having an especially noticeable effect on the allocation of available spending. As of 31 December 2008, 99.5% of Italy's resident population lived in a family. The average number of family members remained stable, at 2.4, compared to 2007. It should be noted that 11.3% of the families residing in Italy find themselves in relative poverty (8 million and 78 thousand people), 4.6% live in conditions of absolute poverty (2 million and 893 thousand people).

In 2008 average monthly spending per family was equal, at current values, to 2,485 euro (2,480 euro in 2007), varying from a minimum of 1,692 euro (single-member families) to a maximum of 3,251 euro (families of 5 or more people). Spending on food and beverages stood at 475 euro, while spending on non-food goods was 2,009 euro. Spending on food and beverages accounts for an average of 19.1% of the total monthly spending of families. Compared to 2007, levels of spending on healthcare, transportation, leisure-time and cultural activities, clothing and footwear, furnishings, home appliances and household services fell. On the other hand, the percentages of spending that families allocated to education, communications and tobacco products remained stable, while spending on fuel and energy was on the rise. Looking at regional differences, Veneto remained the region with the highest average level of family spending, at 2,975 euro (3,047 euro in 2007), while Sicily, which registered 1,742 euro (1,764 euro in 2007) once again was the region with the lowest level.



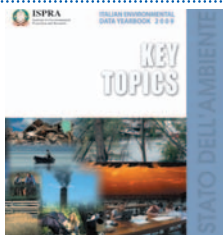
Spending on food and beverages represents 19% of total monthly family spending, while transportation accounts for approximately 14% and housing for roughly 27%.

Economic factors

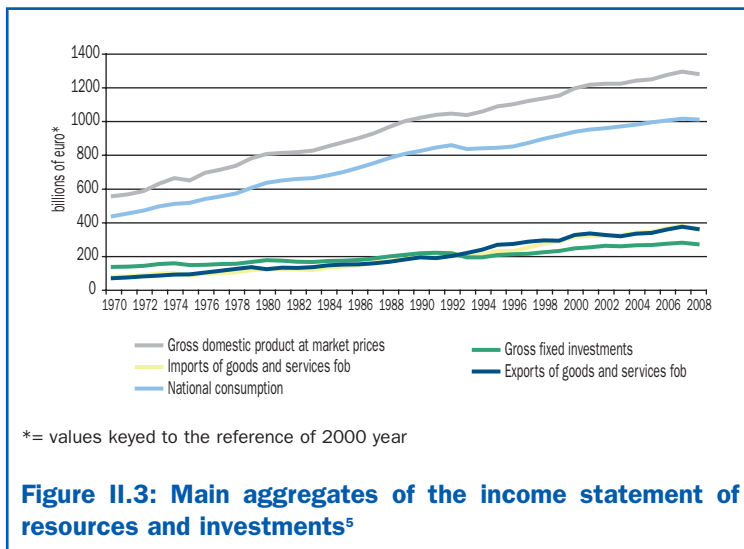
Until such time as the European project “Beyond GDP” generates indicators able to measure long-term economic and social progress more thoroughly and accurately than GDP, and in particular the capacity of a given society to deal with issues such as climate change, the efficient use of resources or social inclusion, classic macroeconomic indicators, estimated on the basis of countrywide results, shall continue to be used to analyse the distinctive features of Italy’s economy.

Between 1970 and 2008, the main categories on the income statement for resources and investments registered noteworthy growth, with the GDP, consumption and investments doubling their levels, while imports and exports rose no less than fourfold (Figure II.3).

⁴ Source: ISTAT data processed by ISPRA



Between 1970 and 2008 the GDP, consumption and investments doubled. Imports and exports increased nearly fourfold.



The national GDP for 2008, calculated in keyed to the reference year of 2000, fell by 1% compared to 2007.

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

In almost all the countries of Europe, consumption amounts to more than 70% of the national GDP.

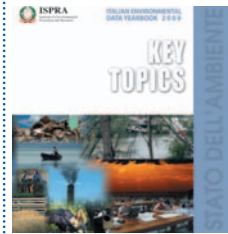
The Gross Domestic Product (GDP), which gives the final result for all the goods and services produced in a country during a given period, stood at approximately 1.277 trillion euro for Italy in the year 2008, calculated in values keyed to the reference year of 2000, representing a decrease of 1% over 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 ppp⁶ are the ones that grow fastest, in Italy do not show this convergence of growth rates, with the southern regions proving unable to close the gap with the richer northern zones.

As for consumption, which constitutes the main component of aggregate demand⁷ all the EU countries, except for Ireland and Luxembourg, present levels of consumption that exceed 70% of their GDP. In 2008 consumption in Italy (74.3% of which is tied to the spending of the resident families) was equal to 1.007 trillion euro, or 79% of the GDP, while gross fixed investments

⁵ Source: ISTAT data processed by ISPRA

⁶ ppp = purchasing power parity

⁷ Eurostat, New Cronos Database



accounted for 21%. In certain countries⁸, 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 import goods and services to sustain levels of consumption and investment which, taken together, exceed the GDP.

In all the countries of the European Union (EU25), more than 60% of the GDP (70.4% in Italy) is generated by the services-industry sector (which include banking activities, tourism, transport and insurance). Industry and agriculture, 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 2008 was only 2.5 percentage points, while the industrial sector (meaning industry in the strict sense, plus construction) accounted for 26.9%.

The composition by sectors of Italy's production structure, as shown by "ASIA"⁹, the archive of Italian enterprises of ISTAT for 2006, is similar to that illustrated for Germany in the EUROSTAT¹⁰ statistics for EU enterprises of 2005, 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.

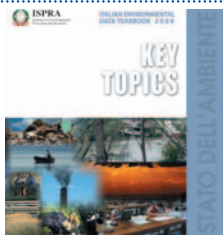
In all the countries of the EU25, more than 60% of the GDP is generated by the services-industry sector.

Italy's central regions show a greater propensity 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.

⁸ Ibidem

⁹ ISTAT, Statistical Archive on Active Enterprises (ASIA)

¹⁰ Eurostat, *Structural Business Statistics* (SBS)



Small-scale enterprises continue to play the predominant role in the Italian production structure.

In recent years industry has increasingly been called upon to reconcile considerations of growth and competitiveness with those of environmental compatibility and sustainable development.

Industry

In 2007, there were 4.4 million Italian industrial and service enterprises, employing approximately 17 million workers (11.4 million salaried employees) and generating roughly 722 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 average company is accompanied by a high incidence of self-employment.

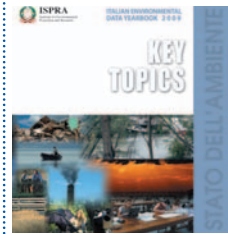
In 2007 there were 1.13 million Italian industrial firms employing approximately 6.72 million workers (5.19 million salaried employees) and turning out value added of more than 333 million euro. The average industrial firm had 5.9 employees, while each company in the sector of traditional industry operates with an average of 9.2 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.

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 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;



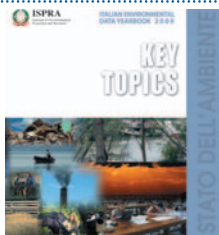
- reducing scrap and, if possible, recycling it within the production cycle.

It is interesting to observe that the number of industrial establishments in Italy considered to be at major accident hazards (MAH), 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), decreased compare to the previous year (2007) by a few dozen units in absolute terms. This variation is due primarily to modifications in the regulations and to the placement in full operation of the procedures that the managers of the plants are required to respect. Only a small portion of the change constitutes actual modifications in industrial activities (closings for the termination of activities, new activities or expansions of existing plants). In terms of the distribution within the national territory of the establishments subject to notification (under arts. 6/7 and art. 8 of Legislative Decree 334/99), fully a fourth are found in Lombardy, while other regions with significant numbers of industrial operations posing risks are: Piedmont, Veneto and Emilia Romagna (all northern regions accounting for approximately 9% each). Such activities are particularly concentrated in certain areas of these regions holding long-time refining and/or petrochemical complexes, such as Treccate (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. There are also central-southern regions with a significant presence of activities subject to notification, and specifically: Sicily (approximately 7%), Lazio and Campania (with slightly more than 6%), Tuscany (approximately 5%), Apulia and Sardinia (approximately 4%); these regions also contain petroleum and petrochemical plants, as in the areas of Gela (Province of Caltanissetta), Augusta-Priolo-Melilli-Siracusa, Brindisi, Porto Torres (Province of Sassari) and Sarroch (Province of Cagliari), while there are concentration of industrial activities in the provinces of Leghorn, Rome, Frosinone, Naples and Bari, plus depots for agricultural products in the Province of Ragusa.

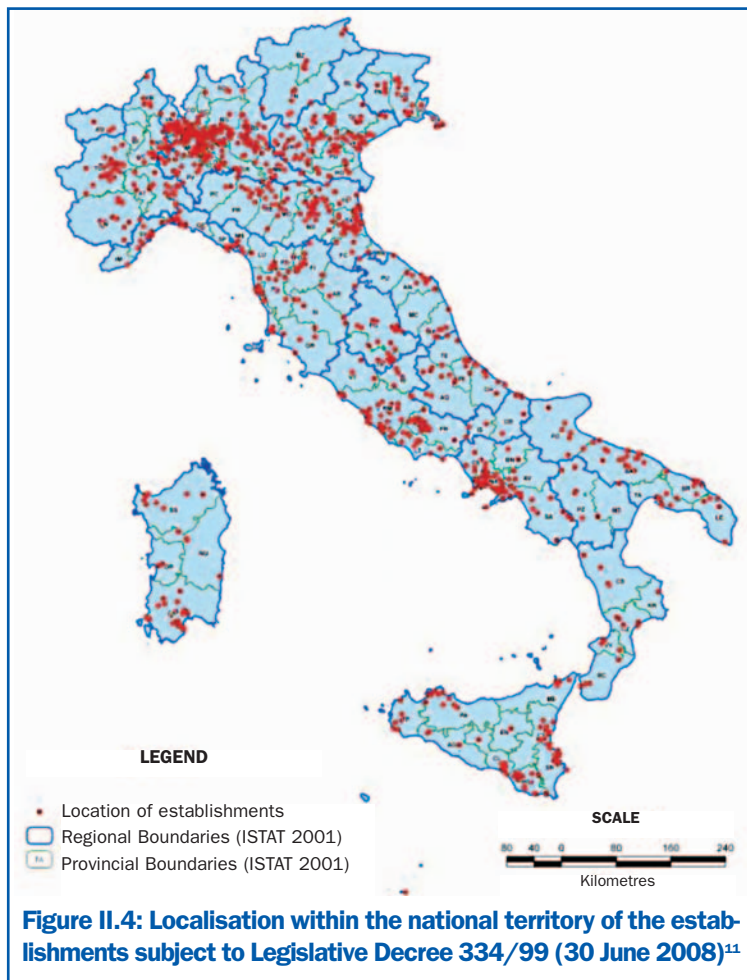
Nationally, a very low percentage (less than 4%) of plants at major accident hazard (MAH) are located in zones classified as highly dangerous (zone 1). The regions with plants located in such zones

The number of plants in Italy considered to be at risk of a major accident decreased by a few dozen units in absolute terms.

A very low percentage (less than 4%) of MAH plants are located in zones classified as highly dangerous (zone 1).

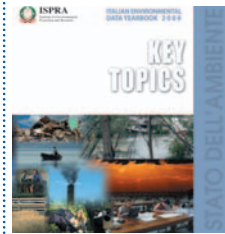


A fourth of the establishments requiring notification (arts. 6/7 and art. 8 of Legislative Decree 334/99) are concentrated in Lombardy, and in the provinces of Milan, Bergamo, Brescia and Varese in particular.



are Friuli Venezia Giulia, Umbria, Abruzzo, Molise, Campania, Calabria, Basilicata and Sicily; of these, Calabria contains 75% of the plants in a seismic zone 1. All the regions, with the exception of Trent Alto Adige, Aosta Valley and Sardinia, have MAH plants in

¹¹ Source: Ministry of the Environment, Land and Sea data processed by ISPRA



zones of elevated seismic risk (zone 2), especially in the case of Sicily and Campania, where more than 90% of the plants fall in such zones. It should also be noted that the plants located in zones falling under the first two seismic classifications, meaning the ones presenting the greatest danger, account for 312 out of a total of 1,090 (approximately 30%), while regions such as Calabria, Sicily, Basilicata, Campania, Molise and Marche have almost 100% of their MAH plants such zones, while the percentage for the regions of Friuli Venezia Giulia, Umbria, Lazio and Abruzzo is approximately 50%. Finally, roughly 70% of the MAH are located in the two other seismic categories (3 and 4), with approximately 40% (459 plants) found in zone 4, which called for no anti-seismic building design prior to introduction of the 2003 classification system.

Energy

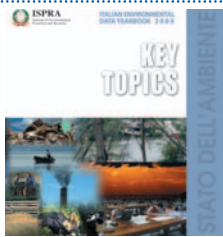
As far as the energy sector in Italy is concerned, the most recent data (ISPRA and ENEA¹²) point to a number of different results, including confirmation of the fact that primary energy intensity¹³ is lower than the European average. However, a comparison with the situation in the rest of Europe over 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. This serves as an indirect sign of efficient conversion of primary energy sources. The increased efficiency - traceable, for example, to a rise in gross production of electric energy by cogeneration plants (starting from 1999), is partially offset by the growing percentage weight of secondary energy sources (electricity, petroleum derivatives) in the final consumption of energy, explaining the extreme variability in the information.

¹² ENEA, 2009, *Rapporto Energia e Ambiente 2008, Analisi e Scenari*.

¹³ The "primary energy intensity" indicator measures the energy efficiency of economic systems, meaning the quantity of energy needed per unit of GDP produced.

70% of MAH plants are located in zones falling in seismic classes 3 and 4.

Apart from confirmation of a number of structural characteristics of Italy's energy system, such as the fact that it outperforms the European average in terms of energy intensity and the ratio between final and total energy consumption, a series of changes in the way energy is procured are also taking place.

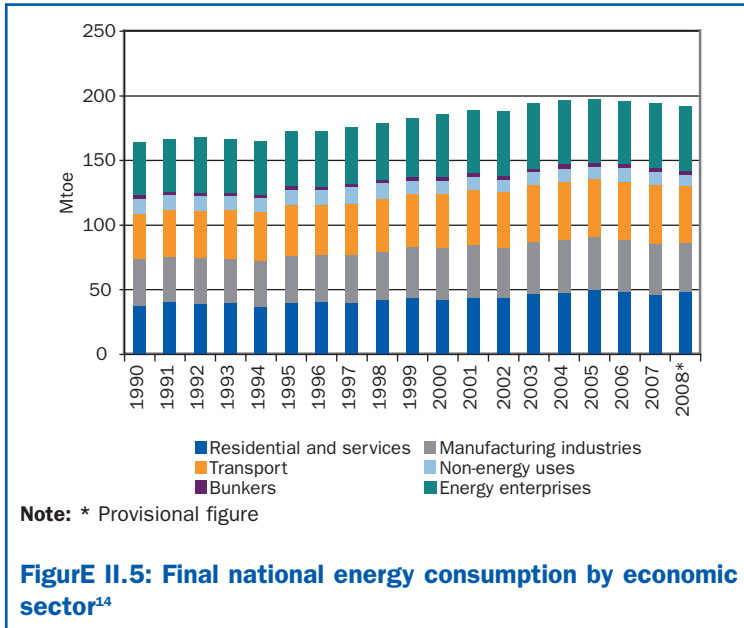


In 2008, the demand for primary energy stood at 192 Mtoe, for a decrease of approximately one percentage point compared to 2007.

In recent years there has been a series of changes in the sources of energy supplies, such as the growing role of natural gas compared to petroleum products, plus an increasing contribution from renewable sources and cogeneration, along with, from 2001 on, a revival in the consumption of solid fuels, whose contribution to total primary energy sources (including primary electric energy) went from 8.6% in 2001 to 11.5% in 2008. Furthermore, the gradual entry in operation, starting from 1999, of combined-cycle plants – with levels of efficiency higher than those of traditional plants – fuelled by natural gas or gas derivatives explains the decrease in average specific fuel consumption in the production of electric energy from fossil fuels, which has fallen by 12% since 2000 in terms of the net electricity produced.

The dynamics of the energy sector are also influenced by the performance of the international fuel market, as well as developments in the regulatory outlook, such as the liberalisation of energy markets and the introduction of new forms of incentives for the production of electric energy from renewable sources, by establishing a minimum quota of renewable sources for each producer of electricity.

In 2008, the demand for primary energy stood at 192 Mtoe, for a decrease of approximately one percentage point compared to 2007. As shown by Figure II.5, the trend in the final consumption of energy increased between 1990 and 2005, peaking at 20.7%. Starting from 2006 there was a reversal, with final consumption as of 2008 having fallen by 4.1% compared to 2005. Overall, final consumption as of 2008 had risen by 15.7% compared to 1990. The primary sectors responsible for the general trend show decreased consumption in recent years. In terms of the break-down in final energy consumption for 2008 (excluding non-energy uses and bunkering), the residential and services sector absorbed 34.4% of consumption, followed by the transportation and industrial sectors, at respective figures of 34.2% and 29%, while agriculture and fishing accounted for the remaining 2.4% of final consumption.



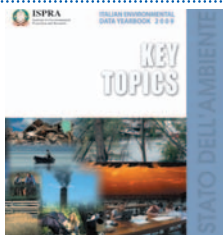
In 2008, the demand for primary energy stood at 192 Mtoe, for a decrease of approximately one percentage point compared to 2007.

Agriculture

Relations between agriculture and the environment are extremely complex, working on two levels. On the one hand, agricultural land is directly impacted by other production sectors (i.e. the consumption of the soil), in addition to undergoing the indirect impact of the physical and chemical alteration of the atmosphere, as well as the occurrence of extreme meteorological events. At the same time, agricultural activities – which, in recent decades, have resulted, in many cases, in intensified, concentrated and specialised uses of the land and agricultural techniques – are considered to be among the primary causes of the pollution of water, loss of stability of the land and pollution and acidification of the soil, as well as increases in the greenhouse effect, a loss of biological diversity, a simplification of the landscape and a reduction in the wellbeing of livestock. There is no doubt, however, that agriculture, in addition to guaranteeing good produc-

Agricultural land undergoes the direct impact of other production sectors, as well as the indirect impact of physical and chemical alterations of the atmosphere, and that of extreme meteorological events.

¹⁴ Source: Ministry of Economic Development



Agriculture, in addition to guaranteeing good production capacity of foodstuffs, wood and fibres, can also carry out important environmental services that are specifically acknowledged and sustained under EU policies in different sectors.

In 2007 Italy's total Utilized Agricultural Area was equal to 12,744,196 hectares.

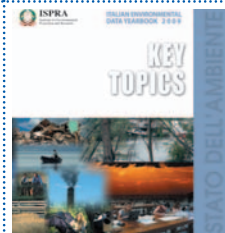
Total farming enterprises number 1,677,766 units.

tion capacity of foodstuffs, wood and fibres, can also play an important role (if properly managed): in the environmental defence of the territory; in the preservation of the biological diversity of ecosystems, species and genomes; in reducing the pollution and deterioration of the land and water.

These important environmental services are specifically acknowledged and sustained under EU policies in different sectors, as well as under the strategies of the EU Environmental Action Program and under the Strategy for Sustainable Development. Along these lines, it should be remembered that the concept of “conditionality” was made a part of Common Agricultural Policy, meaning that the disbursement of direct payments allocated to enterprises depends on compliance with regulations and measures of environmental defence. For the most part, these measures regard “obligatory operating criteria” and “good agronomic and environmental conditions”. At present there are no fewer than 19 legislative acts that place direct constraints on agricultural enterprises with regard to the environment, public health and the health of plants and animals.

In 2007, Italy's Utilized Agricultural Area totalled 12,744,196 hectares, a slight increase compared to 2005 (+0.3%), but a lower figure than that for 2000 (-2.4%). The largest decreases in comparison with that year were observed in the north (-4.2%) and in the central regions (-4.5%). In terms of the management of farming soil, there was a clear prevalence, in the sequences of crops, of free alternation and rotation, at respective figures of 40.8% and 40.1% of the planted UAA. As far as covering techniques are concerned, controlled growing of grass was favoured over green manure and mulching.

In 2007 there were a total of 1,677,766 agricultural enterprises. This figure was lower than the total from the previous ISTAT census of 2005 (-2.9%) and also represents a decrease compared to 2000 (-22.1%), confirming the ongoing erosion in the sector's economic importance, as well as the operational abandonment of farmland, a trend rooted in the country's economic and social transformation. The largest concentration of enterprises is found in the South (959,642 units), representing a decrease from 2005 (-3.3%) and



an even bigger drop from 2000 (-19.9%). Next comes the North, with 449,325 units, and the Centre with 268,799 units. This last zone registered the most significant drop compared to 2000 (-28.5%). In Italy, the number of workers employed by the primary sector has fallen over time. In 2007 agriculture accounted for 4% of all men employed by the Italian economy and 3.1% of all women. These figures, lower than the EU-25 averages, placed Italy among the countries that contribute the least manpower to agricultural activities. Noteworthy in terms of productivity is the comparison between the primary sector and industry: the value added to base prices per unit of agricultural labour in 2008 was equal to 51.2% of the figure for industry. Within the overall overlook, however, the biological branch deserves separate consideration. Though it occupies only 8% of Italy's UAA, it constitutes an important driving force of development and income for the companies involved in biological farming. Though the surface utilised for, or being converted to, biological agriculture decreased by approximately 12.9% compare to the previous year, our country remains one of the main European user of this production technique, in terms of both surface area and number of enterprises involved.

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"*¹⁵. 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, 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 those registered in the years 2005 and 2000.

Plant health products are used 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

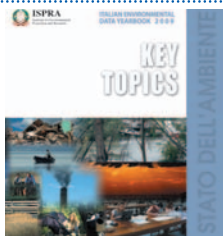
¹⁵ INEA definition under the RICA methodology

In 2007 agriculture accounted for 4% of all men employed by the Italian economy and 3.1% of all women.

The value added to base prices per unit of agricultural labour in 2008 was equal to 51.2% of the figure for industry.

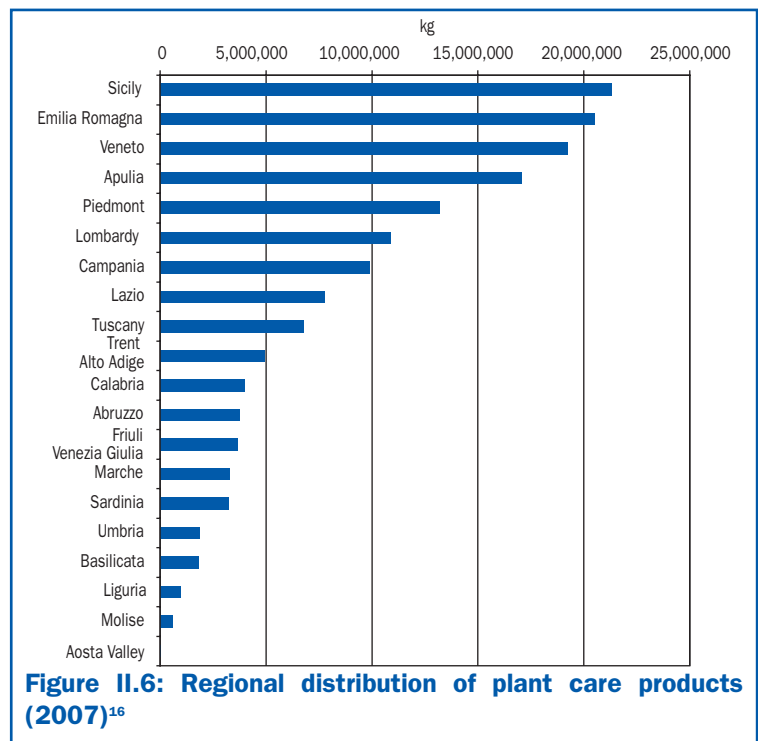
The total national SGM for 2007 was 25,000,347 ESU, a marked increase compared to 2005.

In 2007 approximately 150 thousand tons of plant care products were placed on the market.

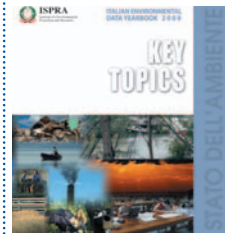


processes of vegetables (not including fertilisers). In 2007 approximately 150 thousand tons of such products were put on the market, a decrease of 3% compared to 2006. Fungicides account for 50.9% of the total, followed by insecticides and miticides (18.1%), herbicides (17.8%), miscellaneous products (fumigators, plant regulators, molluscicides, carriers and other) (12.9%) and biological items (0.2%). Compared to 1997, distribution has fallen by 8.1%. Decreases were registered in all categories, and especially for insecticides and miticides (-31%), apart from “miscellaneous”, which rose above 39%. Sicily (Figure II.6), with more than 21,000 tons (13.7% of the national total), was the region with the highest distribution, followed by Emilia Romagna (13.4%), Veneto (12.5%), Apulia (11.1%) and Piedmont (8.6%). Almost 60% of all plant health products, therefore, are distributed in these five regions.

Sicily, at over 21.000 tons (13.7% of the national total), is the region with the highest distribution of plant care products, followed by Emilia Romagna (13.4%), Veneto (12.5%), Apulia (11.1%) and Piedmont (8.6%).



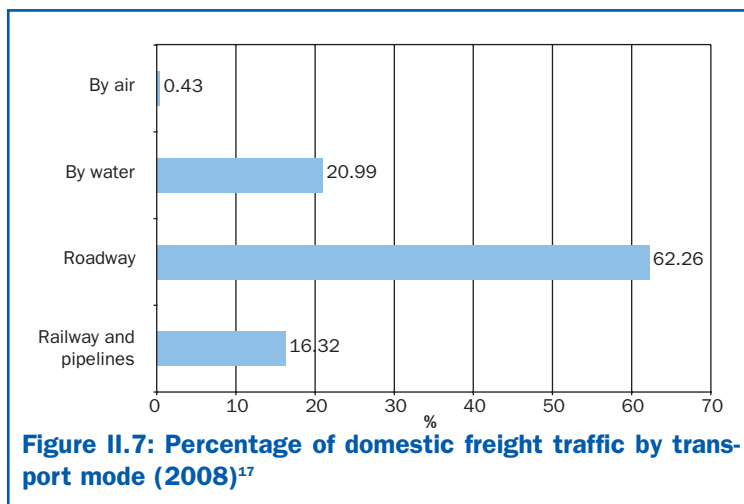
¹⁶ Source: ISTAT data processed by ISPRa



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 2008, estimated at slightly more than 230 billion km-tons, shows an increase of 5.8% over 2004. A break-down of the freight traffic data by mode of transport points to an absolute predominance of roadway traffic, which, in 2008, still absorbed 62.3% of the total km-tons transported. In the same year, the percentages absorbed by the remaining modes of transport were: 21% by sea-way ; 16.3% by railway and pipeline; 0.43% by air-way, which continues to cover only a minimal portion of domestic freight transport, being devoted primarily to international transport (Figure II.7).

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

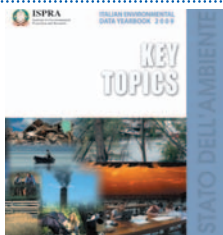


In 2008, roadway transport once again proved to be the predominant mode, accounting for 62.3% of the km-tons transported.

Domestic passenger transport shows a fluctuating trend during the period 2004-2008, with growth of 6.5% in 2006, compared to 2005, followed by a decrease of -4.7% in 2008, as compared

Domestic passenger transport shows fluctuating trend for the period 2004-2008, with a decrease of 4.7% in 2008, compared to 2007.

¹⁷ Source: CNT 2007-2008 data processed by ISPRA

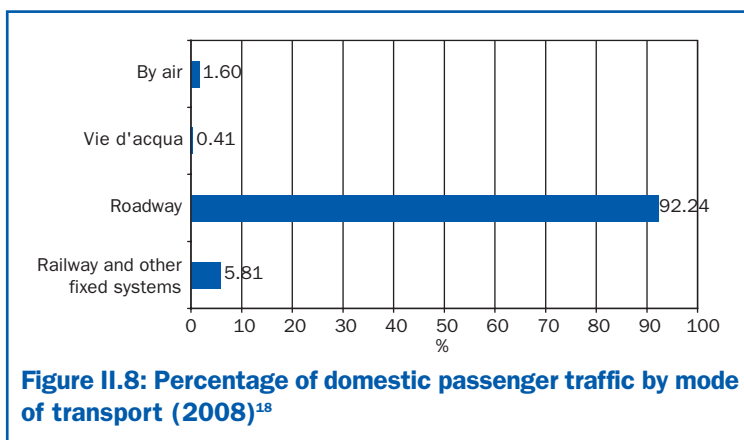


Looking at domestic passenger transport, roadway travel is virtually the only mode used (92.2%).

Commercial air travel grows by 11.8% between 2004 and 2008. Vehicle traffic registers a 60% increase in km travelled on Italian highways between 1990 and 2008. Between 2004 and 2007, passenger transport on the railway network rises by 5.6%, while freight transport shows a 1.2% increase.

to the previous year. Despite this fragmented trend, there was a slight overall increase of 1.6% between 2004 and 2008.

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 remained virtually unchanged, with respective values of 5.8% for transport by railway and other fixed systems, 1.6% for air transport and only 0.4% for transport by sea (Figure II.8).

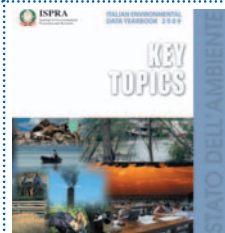


A more detailed analysis of traffic, broken down by the different modes of transport, highlight a variety of situations. The data on air traffic, based on the number of movements of commercial aircraft (domestic and international), though shows a growth of +11.8% between 2004 and 2008¹⁹, they reduce of -4.3% during the last year. A long-term look at vehicle traffic (1990 – 2008) shows an approximately 60% increase in the kilometres travelled by light and heavy vehicles on Italian highways, while the result for last year (2007-2008) was a slight decrease in traffic (-0.8%)²⁰. As for railway traffic 315 million train-km of passenger transport circulated in 2007 on the State Railway

¹⁸ Source: CNT 2007-2008 data processed by ISPRA

¹⁹ ENAC

²⁰ AISCAT



System (+5.6% compared to 2004), while approximately 63 million train-km of freight of traffic (-1.2% compared to 2004).

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

As of 31 December 2007, the primary Italian roadway network (not including municipal roads) was 182,136 kilometres long, consisting of 6,588 km of motorways, 19,290 km of other roads of national importance and 156,258 km of regional and provincial roads, for an overall increase of 8.6% compared to 2000.

Looking at the statistics on roadway traffic, the figures provided by the AISCAT (the Italian Association of Motorway and Tunnel Concessionaire Companies) on the volumes of traffic recorded on the motorway network operated under government concessions (5,485.9 km as of 31 December 2008), shows that the daily average theoretical vehicles in circulation in 2008 numbered more than 41 million (almost a million less than in 2007), consisting of 31.5 million light vehicles (76.2%) and 9.9 million heavy vehicles (23.8%).

As for the railway network, its total track length as of 2007 was approximately 20,035 km, or 771 km more than in 2000. More significant increases are registered in the lengths of the electrified network and of the two-track network, which grew by respective figures of 8.6% and 17.6%.

The available statistics also point to a significant quantity of port infrastructures in Italian territory. As of 31 December 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 more than 1.5 kilometres per port.

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

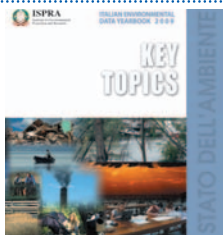
Examining airport infrastructures in Italy, there were 100 airports distributed throughout Italian territory in 2007, one less than in 2006, while the airport grounds covered a surface area of approx-

As of 31 December 2007, the primary Italian roadway network (not including municipal roads) shows an overall increase of approximately 8.6% compared to 2000.

Between 2000 and 2007 the railway network grew by 771 km.

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

Domestic airports covered a total surface area of 150 km² in 2007, and overall

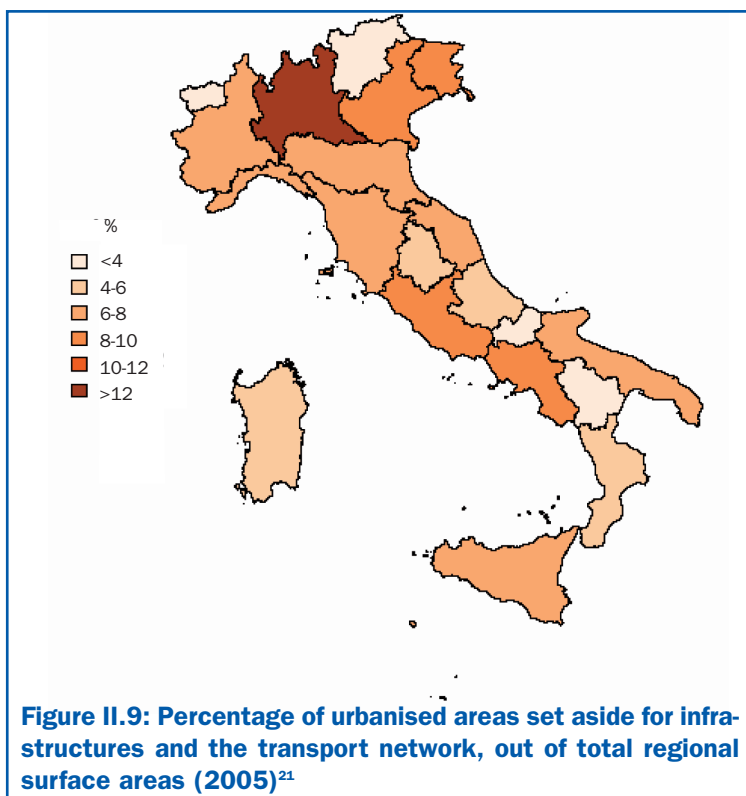


runway length was approximately 202 km.

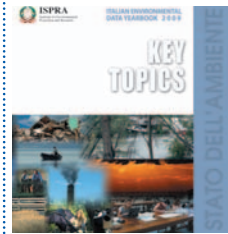
imately 150.6 km² and runway length totalled approximately 202 km.

An overview of the urbanised surface area set aside for infrastructures and the transport network is provided by Figure II.9, 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 set of regions in the range of 8-10%: Veneto (9.7%), Campania (8.9%), Friuli Venezia Giulia (8.3%) and Lazio (8.2%).

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%).



²¹ Source: Ministry of Infrastructures and Transport and ISTAT and APAT-CLC 2000 (urbanised) data processed by ISPRA



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.

Internationally, arrivals rose by 2% in 2008, compared to 2007. Though Europe is still the most frequently visited destination (53.1% of all international arrivals), the number of arrivals remained essentially stagnant in 2008, rising by only 0.3%, due primarily to growth of 3.1% in the central-eastern European market.

In 2008, tourist arrivals and overnight stays in all of Italy's hospitality structures registered an overall decrease (respective figures of -0.6% and -0.8%). The average stay (3.9 days) remained unvaried from the previous year, in line with the trend of recent years towards more frequent trips but for shorter periods.

Climate is one of the main driving factors behind the seasonal structure of tourist demand, determining its length and quality playing a key role in the choice of the destination and decisions on how much to spend. In 2008 the peak season for tourist flows remained the third quarter (with 49% of overnight stays).

Of the total number of trips taken by Italians (roughly 122 million), 63.6% are taken in cars. The tendency of Italians to travel by air is on the rise (15.6% 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 modes of transport used by foreign tourists who come to Italy, the car continues to be favoured, registering an increase (+4.7%) between 2007

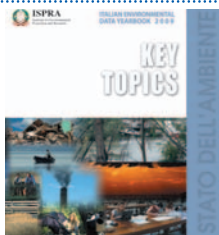
Tourism and the environment are closely connected.

Europe received 53.1% of international arrivals.

Tourist arrivals and overnight stays in Italy fell by respective figures of -0.6% and -0.8%.

The climate is one of the key driving factors behind the seasonal structure of tourist activity. In 2008, 49% of the overnight stays again occurred in the third quarter.

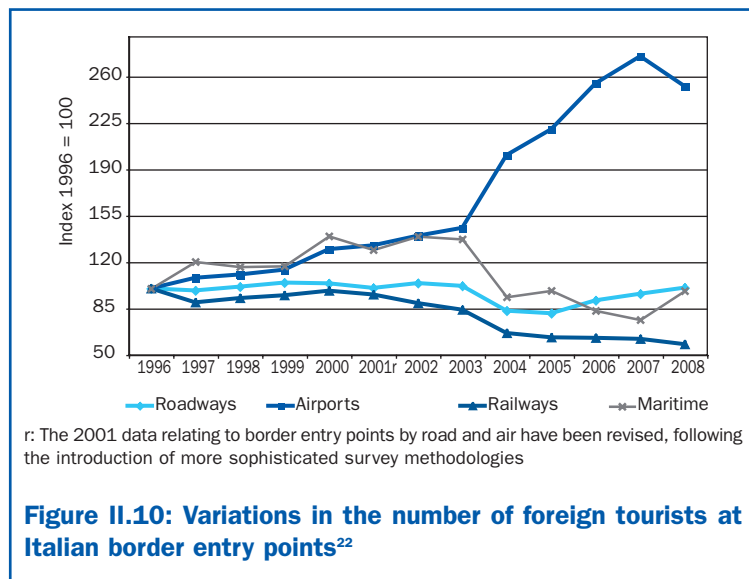
The favourite Italian mode of transport for trips is the car (63.6%).



The car continued to be the preferred modes of transport for foreign tourists to Italy, growing by 4.7% between 2007 and 2008.

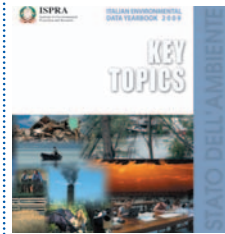
Tourism places a variety of environmental pressures.

and 2008. In contrast, air travel as the mode of transport used by foreign tourists to reach Italy showed a decrease (-8.1%) on an annual basis for the first time since 1996, primarily to the advantage of cruise ships, which registered a significant growth (+28.5%) (Figure II.10).



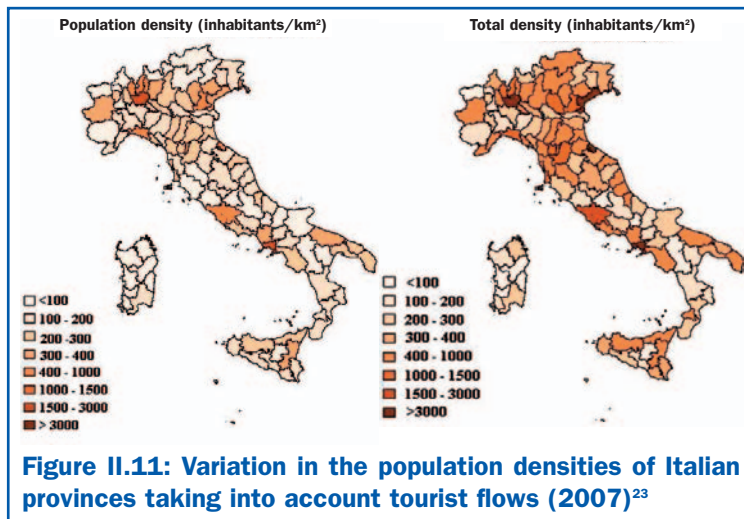
Tourism inevitably brings change with it; the yearning for environmental and cultural values, together with the desire for new experiences, can create disturbances in the balance of socio-environmental factors. Environmental pressures on the environment have a wide variety of effects, though a number of constants can be observed: elevated number of tourists, seasonal concentrations, use of the most polluting modes 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.

²² Source: Bank of Italy data processed by ISPRA



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 on a par 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.11).

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.

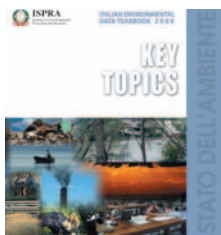


The map on the left, showing the "Population density", groups the Italian provinces into eight population density classes; the map on the right showing the "Total density", groups the provinces into the same eight density classes, but also takes into account the total density, i.e. Resident (Population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

II.3 Potential developments

Though the ramifications of the current global economic crisis must be dealt with, one of the priorities of Italian policy is to move towards a sustainable environmental economy, enacting forms of environmental governance in order to respond in the most effective manner possible to the increasing challenge of efficiently and

²³ Source: ISTAT data processed by ISPRA



Italy's priority environmental policies.

effectively managing water resources, use of the territory, biodiversity and energy, which also constitute the “cornerstones” of policies and measures for mitigation, and adaptation to climate change.

The priority environmental policies, outlined by the Ministry of the Environment, Land and Sea and calling for measures of urgent intervention, are:

1. efficient management of water resources;
2. land reclamation;
3. reduction of waste generation;
4. protection of biodiversity and ecosystems;
5. clean energy and better air quality.

The fight against climate change is the chief challenge for the coming decades, though it will also serve as an opportunity to lessen current environmental pressures caused by unsustainable models of production and consumption that result in emissions of polluting substances, increased waste generation, a shortage of natural resources and a loss of biodiversity and ecosystems.