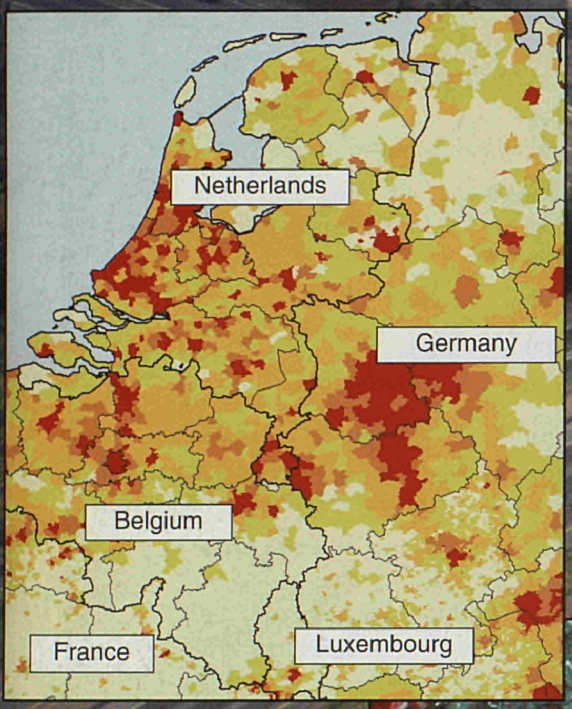
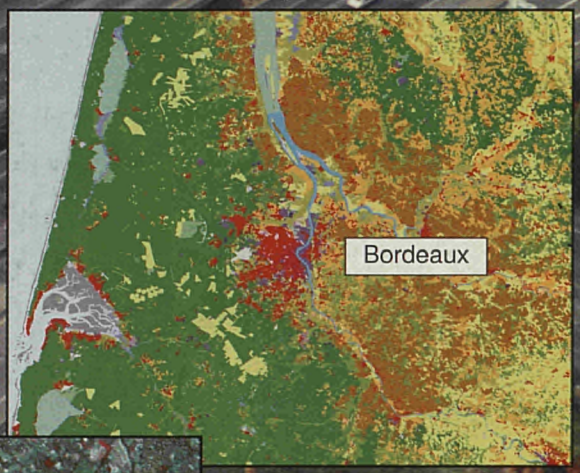
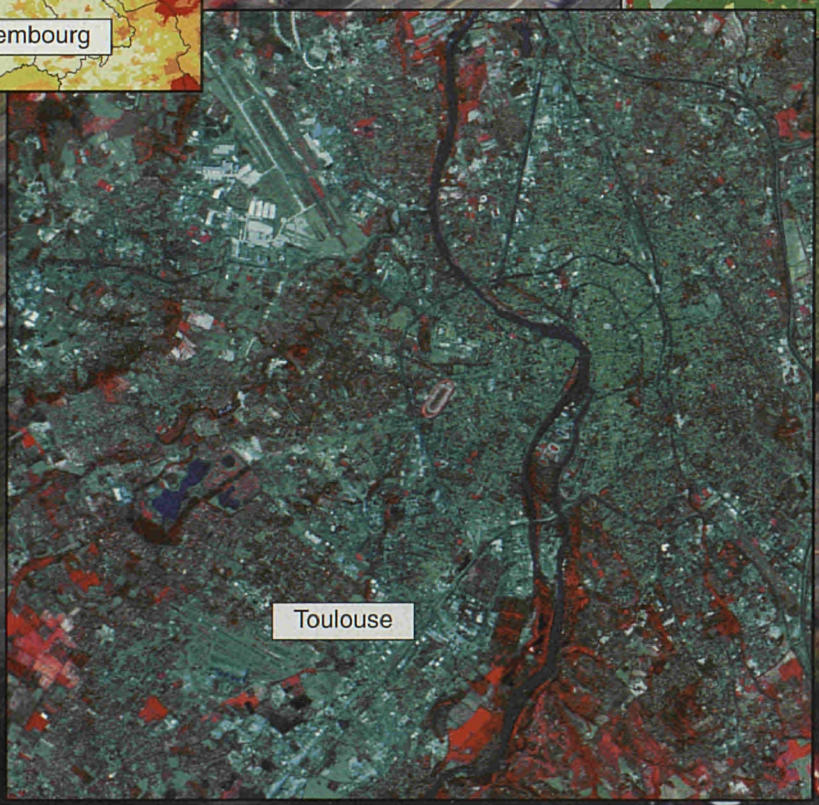
The bulletin of European statistics

SIGMA

Statistics and Geography







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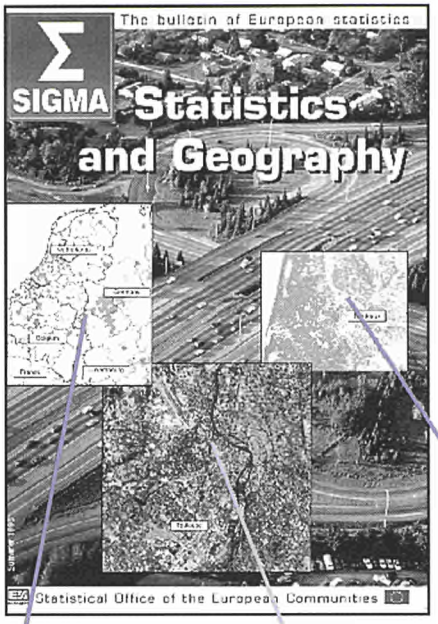

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Managing editor
Fernando de Esteban

Chief editor
Daniel Byk

Assistant chief editor
Fons Theis

Editorial team
John Wright
Jean Drappier
Barbara Jakob
Martine Kleinberg

Assistant
Virginie Benoit

Layout
Claudia Daman
Quentin Masquelier

Cover
Made by Sams - Luxembourg

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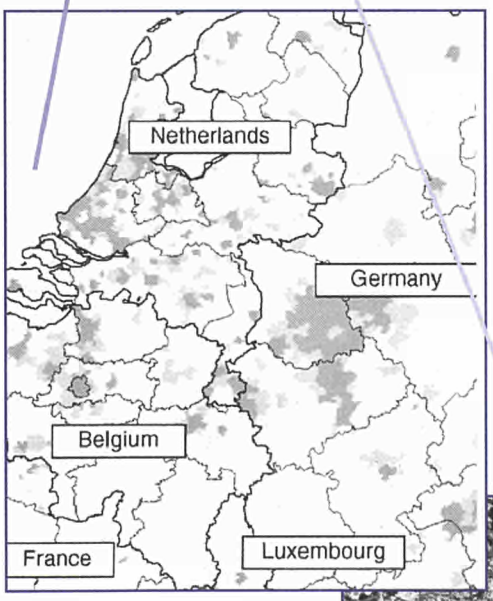
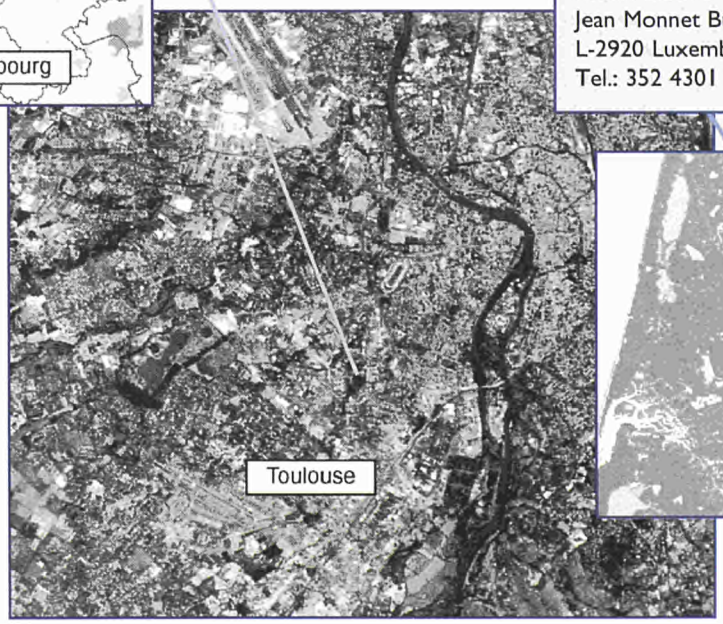
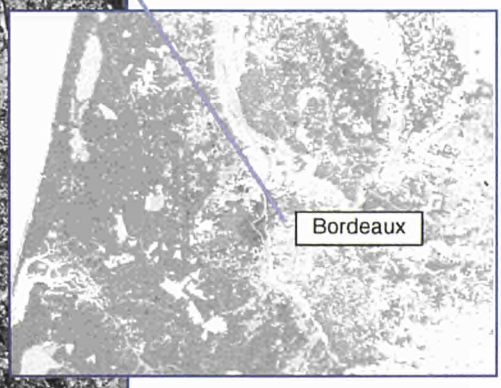


This map shows population density by inhabitants per square kilometer at commune level in BENELUX and neighbouring countries, one of the most densely-populated regions in Europe.



Remote sensing satellite at work. This is how the Toulouse area appears from the French SPOT satellite at a height of about 800 km. The photo is a combination of three different spectral regions and shown as a so-called "false colour composite". The ground resolution is 20 metres.



This picture shows the land cover of Bordeaux, corresponding to the European classification of land cover CORINE in 44 classes.

CONTENTS

Combining statistical and geo-referenced data

Roger Cubitt, Eurostat

For the last six years, Eurostat has been involved in geographical information. The last four have taken the form of a formal project called GISCO: Geographical Information System for the Commission. In this time Eurostat has been building up awareness and expertise in GIS to the point where today the full power of the combination of statistical and geographical information is becoming evident.

The initial impetus for the development of GISCO came from the unit for environment statistics within the directorate also responsible for agricultural statistics (Directorate F) under the guidance of its Director, David Heath. The directorate had already been involved with the MARS Programme (Monitoring Agriculture with Remote Sensing) and the need to integrate environmental information with more classical statistical indicators encouraged the use of a geographical reference frame as a mechanism to relate such information. A significant influence in this area was obviously the CORINE Programme (CoORdination of INformation on the Environment) in the Commission which had assembled geographical data in a GIS system being used also for non-environmental needs. With the decision to set up the European Environment Agency, now located in Copenhagen (Eurostat co-operates with the Agency on environmental and geographical data matters), and the taking-over of the CORINE programme by the Agency, it fell to Eurostat to provide a GIS service also for other Directorates-General of the Commission.

Work on prototypes

From these beginnings Eurostat, supported by the DG XII (Science, Research and Development) research budget, initiated some prototype work in remote sensing for statistics, first through participation in a local project in Luxembourg on forest damage following the storms of 1990/91 and then a co-operative European research project on urbanisation. In addition, the requirement that had always existed in Eurostat to map regional statistical data found a more reliable source of the necessary boundary information via the use of in-house GIS technology. From here the areas where GISCO could find a ready interest expanded rapidly particularly given the impetus of the Trans-European Networks initiative which rapidly brought transport, regional policy and then energy in as significant activities. Meanwhile, the agriculture sector had moved on apace and DG VI (Agriculture) had, with GISCO assistance, set up its own GIS section within its informatics division, which is currently developing to meet the specific needs of the agriculture policy domain.

The situation now, after four years of the GISCO project, is that Eurostat has built up a considerable number of thematic coverages for EUR 12 and EUR 15. These coverages have been obtained from a variety of sources and have required some considerable efforts to render them homogeneous and compatible. The demands on the GISCO service have resulted in a restructuring into "service management" and "development" components in order to better meet demands. Meanwhile the geographical data supply problems are being tackled through an initial contract with the MEGRIN consortium of mapping agencies to obtain an administrative boundary data set compatible with Eurostat's regional nomenclature (the NUTS). This data set (known as SABE, Seamless Administrative Boundary Data Set) is currently being finalised and redistribution rights are currently under negotiation. It is hoped that further thematic coverages will follow.

Highlighting policy effects

What is now becoming increasingly useful is the ability to merge and display the different coverages thus showing various features of certain European policy initiatives in relation to each other. This has already had the effect of highlighting potential points of interest (or possible anomalies) resulting from different policies. As a by-product it becomes feasible to "see" the impact of EC initiatives at a regional level, a point which will not be lost on the new Regional Committee created under Maastricht. In addition the integration of socio economic information (eg population, employment, industrial and agricultural production etc.) with geo-referenced data (eg transport infrastructure, urbanisation, watersheds, air quality) is providing the beginnings of some real spatial analysis work with Commission policy departments.

These developments begin to demonstrate the possibility of monitoring the results of Commission policy initiatives in an integrated way, but the implications go beyond this.

Already in both the Regional Fund allocation exercise and the Trans-European Networks Programme the use of GIS to display the results of the decisions taken has been extensively used. For the former, the allocation was driven by a series of statistical indicators which were elaborated at the commune level (NUTS5) which served as a basic information set in the process. It is clear from these (and many other cases) that the original decisions made on the general framework under which support would be allocated (eg the six objectives defined for Regional Funding) could have been facilitated and improved by use of the analytic and presentational power of a GIS. There is a clear role for spatial analysis in the evaluation process which leads to such frameworks in a number of policy areas where there exists such a spatial component, and it is statistical information in combination with geographical information which provide the main support for such an approach.

Making mapping voices heard

The Commission's activities have regional implications in very many ways. Geographical information has not had, and still does not find, a completely natural home within the institutional framework and so a natural focal point towards external interests. In developing GISCO, Eurostat has also provided a forum within which the EU national mapping agencies can begin to get their voices heard. To this end Eurostat (in association with the DG XIII IMPACT Programme, Information Market Policy Actions) has held two annual meetings of Heads of EU mapping agencies to provide a process of input to the Commission authorities of the GIS issues. Resulting from the first of these meetings, Member State representation at Ministerial level requested the Commission to take some positive steps with respect to geographical information issues at a European level. The Commission response to this, via a letter from its President, was positive and proposed a communication to Council in the 1995/96 timeframe. This was to be established under the aegis of DG XIII in the context of the Bangemann Report, in co-operation with Eurostat and DG XII-Joint Research Centre. This communication is being developed and a number of issues are currently being examined for appropriate inclusion.

Enormous potential

When the GISCO Project was first proposed my personal reactions were negative despite an intellectual excitement at the prospect of this new area of work. I could see that we were entering a domain in which Eurostat had no operational or technical experience and which would also involve us in a political debate with partners whom we did not know, the national mapping agencies (NMA). Now after four years of work I can see my initial worries were not without justification. However, the potential we can now begin to see of putting together these two complementary information sources more than justifies the effort involved. It is also encouraging that the discussions with our new partners, the NMA, has always been extremely constructive and positive. What is ironic is the realisation that statistics is about geography, only the link had not been appropriately explored. I am now firmly convinced that we can no longer return to ignoring the geographical component in our statistical information and that (as I have always stated) not only "the whole is far greater than the sum of the parts" but also just looking at the whole neglects important issues affecting the parts.

In the following pages *Sigma* examines various aspects of *Statistics and geography.*

When statistics and geography married at Eurostat the result was both original and useful: GISCO, the Geographic Information System of the Commission of the European Communities.

Putting statistics on the map

by Martine Kleinberg and Barbara Jakob

Estimates of how many people can access the Trans-European Road Network within half-an-hour's drive displayed on a map or how many people live within 50 km of a nuclear power station and might be in danger in an accident – these are just a few examples of the fruitful "marriage" of statistics and geography.

Geographical Information Systems (GIS) enable users to encode, store, process, maintain, analyse and present data in association with their geophysical location. Economic, social and natural areas and phenomena all have a spatial component. This is also one of the primary modes of organising statistical information. Joining the two opens up new possibilities of presenting data in a very effective way.

By the use of Geographic Information Systems (GIS) the underlying information contained in Community statistics can be more readily analysed, visualised and reported, making policy-making and monitoring more effective.

Developing the geographical dimension of official statistics was recognised as an important new area. That is why in October 1990 Eurostat created a Task Force for Spatial Statistics. This led in 1992 to the birth of GISCO. It gives the European Statistical System a spatial dimension, enabling users to produce cartographic images of numerical data and to detect connections and combinations which might otherwise not have been perceived.

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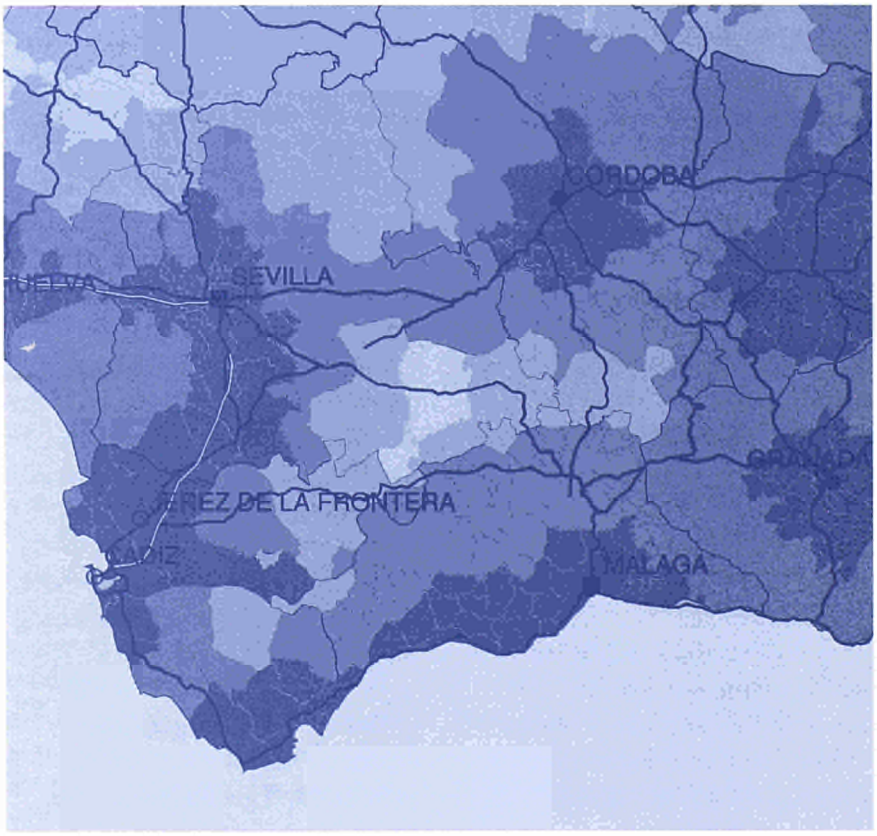


Time-distance measures - time calculations based on commune populations, populations of large urban centres and existing road network

Sigma met some of the people involved in the ambitious project. Some have now left, after concentrating all their efforts on building up and improving the system: Roger Cubitt, former head of the Eurostat division covering database management, publications and GIS, and Jan Byfuglien, detached from Statistics Norway. Others are still with it, like Josefine Oberhausen, production service manager, and Arne Ottestad, who has replaced his fellow Norwegian. Vital Schreurs has been with the project since 1991 and is now working as a consultant.

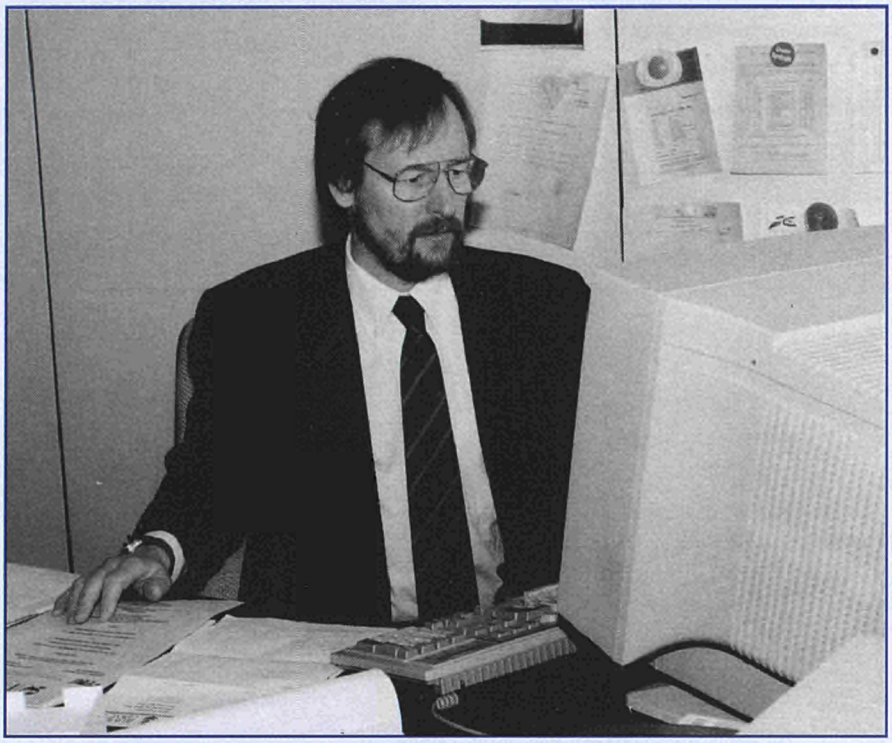
How GISCO came about

Pressure to develop GIS activities in Eurostat came from:
· rapid acceleration of environmental consciousness coupled with the international aspect of policies in this field
· growing regional policy initiatives in the Community.

"Eurostat's increasing activities in the area of GIS have resulted largely from a demand-led pressure, not only from the environmental statistics area but also from other policy areas – eg regional policy, agriculture, transport – where, more and more, the geo-reference is needed to assist interpretation and analysis of the figures presented", Roger Cubitt explains.

As a first step the Task Force for Spatial Statistics was created in October 1990. And Eurostat's Environment Division, Unit F3, assumed leadership of GIS activities at Eurostat.

In 1992 GISCO was born as a Commission service and it was decided that it should be centrally managed as a permanent Eurostat facility under Directorate A, Unit A4 - management of databases and publications.



Roger Cubitt, former head of Eurostat's A4, the division covering database management, publications and GIS, made great efforts to bring GISCO forward

Why Eurostat?

According to Roger Cubitt, it was Eurostat's existing role as a supplier of reference information to the Commission, coupled with its experience in handling large volumes of data in a highly-automated computing environment, which made it a natural candidate for management of geographical reference data.

When the CORINE (Co-ORdination of INformation on the Environment) programme (a pilot project on environmental data) was coming to an end with its legacy moving to the European Environment Agency, there was a need to find a Commission framework to ensure that the results were not lost; in particular the GIS capabilities. CORINE, the first European Community project including the spatial dimension, had actually assembled geographical data in a GIS system also used for non-environmental needs. Eurostat was associated with CORINE through its Environment Statistics Division.

Roger Cubitt reminds us of further motives for asking Eurostat to manage GISCO:

"First, Eurostat is not policy-oriented: it is a neutral and horizontal service inside the European Commission.

"Second, Eurostat had already an existing network with the other Directorates-General, through, for instance, its Steering Committee on Community Statistics which gathers representatives of all the DGs and Eurostat's Director-General.

"Last, GIS implies informatics. Eurostat, highly computerised, was already used to manipulating gigabytes of data."

After the transfer of the project from Eurostat Unit F3 - environment, to A4 - management of databases and publications, the first years' work was mainly practical consolidation of the achievements of the Task Force for Spatial Statistics.

In 1995 the GISCO "project" was mature enough to become a real "service". "Things were running", says Cubitt.

Josefine Oberhausen - she studied applied geography and is now production service manager and as such responsible for GISCO

The mandate

Taking into account the spatial component of economic, social and natural events and phenomena, GISCO enables Community policy-making to be based on geo-referenced data. It thus serves a useful purpose in the development of new policies or monitoring those already being implemented.

Eurostat's GISCO role is not only to create an integrated geographical information system as a reference source for all Commission users, but also to use GIS techniques as a basis for the integration of different data sets on multiplesubjects to create new information services of benefit to the Commission, business users and the public.

But, as **Jan Byfuglien** explains, "GISCO is not only dealing with statistics. Putting statistics on maps is one aspect of its function. It is also supplying general geographically-based data, such as land cover."

He adds that GIS and, more specifically, spatial analysis should be considered as practical tools available to decision-makers. It may help them, in considering different policies, to evaluate the options and compare different scenarios.

Josefine Oberhausen tries to give us a concrete idea of the significance of geo-referenced analysis. "Spatial analysis has very specific applications in connection with employment, transport and urban or rural zones. Spatial relations are analysed by combining different data sets. Thanks to GIS, a mix of information from different themes is possible. For instance, putting together environmental data and the TEN programme (Trans-European Networks) reveals that the TEN programme is not always respecting protected areas. Unfortunately there is still a lack of resources to develop this interesting activity inside GISCO."

GIS must be able to answer several types of questions:

- ***What is to be found at what specific location?***
- ***At what location is a specific feature, item of information or characteristic located?***
- ***What changes have occurred at a specific location since a particular date?***
- ***What type of spatial configuration is to be found at a specific location? (eg urban or rural)***
- ***What happens if..? (measurement of the impact of modifications of certain parameters at certain locations by modelling, simulation etc)***

What GISCO offers

Before carrying out spatial analysis there are several preconditions. First, of course, is the availability of data on the underlying geographical or topographical situation, such as the delimitation of coastal zones and watercourses, relief and alti-

tude, land cover, road networks, local infrastructure, administrative boundaries etc.

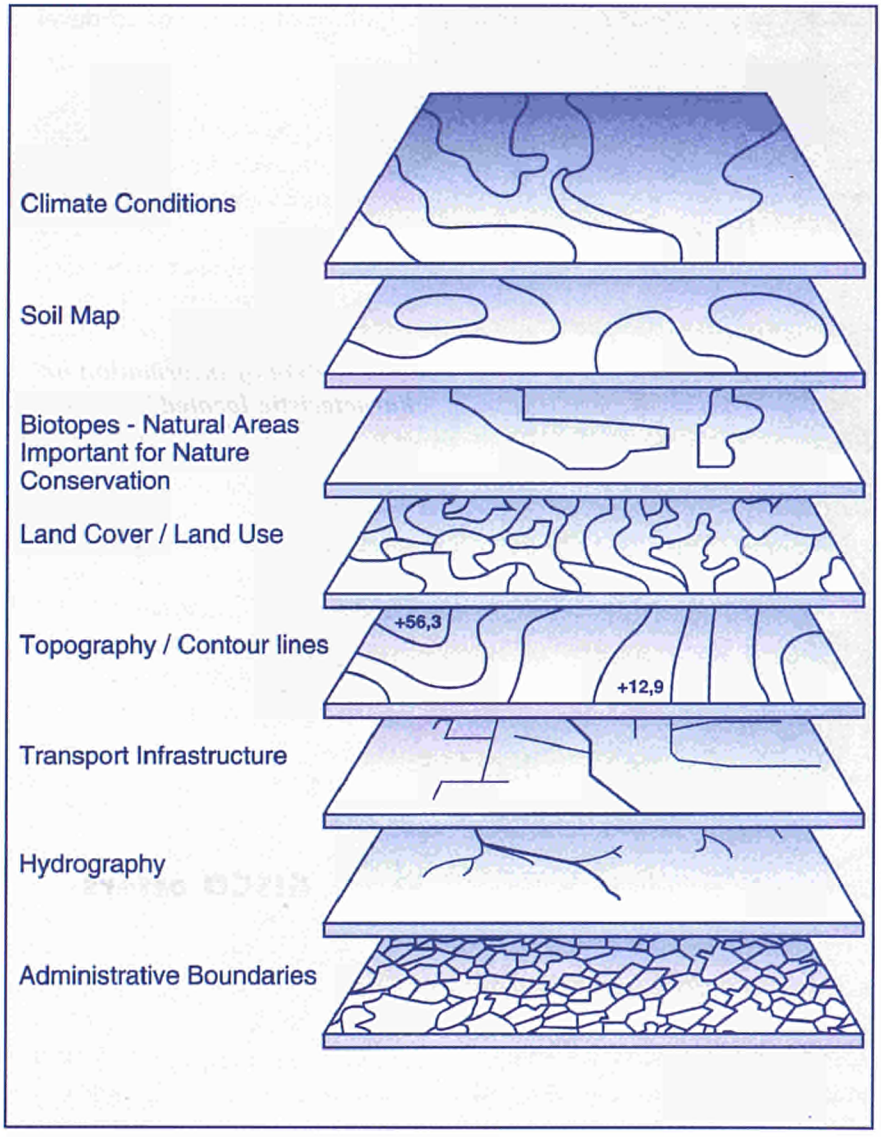
The geographical data sets relevant to a number of areas in the GISCO database can therefore be classified as 'topographic reference data' and 'GISCO thematic data'.

Essential reference data

As basic topographical reference data GISCO includes administrative boundaries based on the NUTS, as well as commune boundaries and administrative regions across Europe. The second theme of the basic topographical data is information on the infrastructure, which is subject of cooperation between DG VII - Transport Policy, Eurostat D4 - Transport Statistics, and GISCO with the aim of setting up the spatial component of the TRAINS (TRAnsport INformation System) project, and to manage the geographical information related to the TEN programme.

The integration of transport infrastructure data in the GISCO database is an important part of the project. GISCO-designed geographical coverages are organised into different layers eg airports, ports, road transport, and railway infrastructure - the combined Trans-European transport networks. GISCO data will be used to put transport infrastructure into environmental and socio-economic contexts, in addition to analysing the accessibility, multimodality and eventually the performance of the networks.

Furthermore, it gives information on, for example, urban centres, hydrography (water patterns and watersheds), altimetry and such items as an inventory of major landmarks.

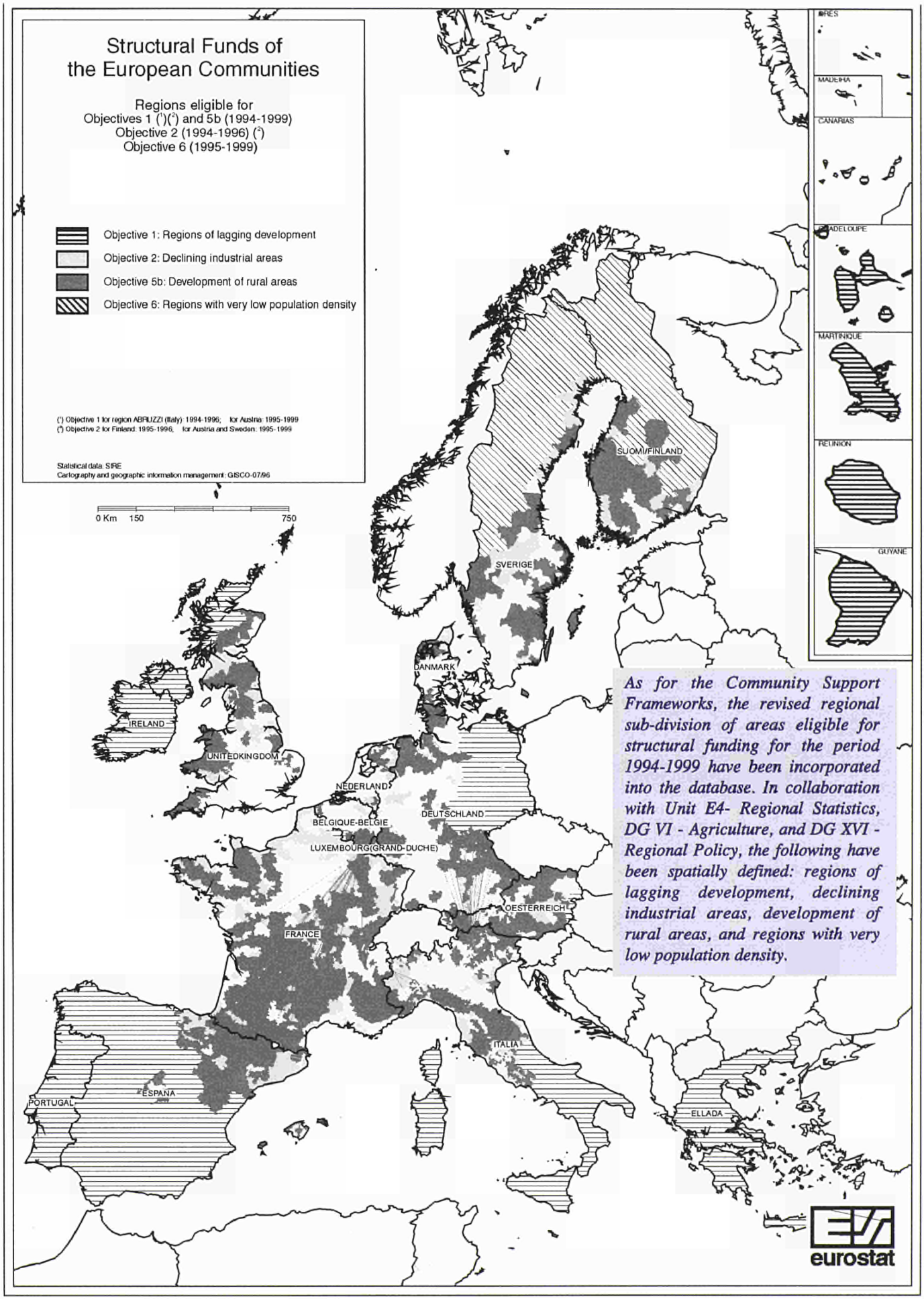


GISCO offers a wide range of information

Wide range of thematic data

GISCO thematic data comprises infra-regional themes, information on the Community Support Frameworks (CSF), on industrial themes like energy networks, as well as data on land (climate, fishing areas, soil map) and natural resources and on the environment.

By agreement between the European Environment Agency and Eurostat, GISCO took responsibility for continuing maintenance of a selection of the former CORINE databases. During the CORINE programme (1985-1994) a large database on environmental topics was built up. From these GISCO integrates (partly in the reference data) information on the following subjects: environment (coastal erosion), land resources (land cover, soil, climate, land quality, soil erosion risk), and natural resources (biotopes, bio-geographical zones, natural vegetation and designated areas.



As for the Community Support Frameworks, the revised regional sub-division of areas eligible for structural funding for the period 1994-1999 have been incorporated into the database. In collaboration with Unit E4- Regional Statistics, DG VI - Agriculture, and DG XVI - Regional Policy, the following have been spatially defined: regions of lagging development, declining industrial areas, development of rural areas, and regions with very low population density.

Up to now we have described the possibilities that GIS techniques offer and the present situation of the GISCO database. But what impact has GIS on the work of statisticians and what are the problems to be faced in building up a Geographical Information System for the Commission?

Focussing on Europe's regions

The close link between statistical data and spatial analysis obliges statisticians to concentrate on the special problems of geographical information and management. Hitherto, statistical data have been tied too exclusively to official reference points like regions, countries etc.

GIS places data in a physical space context, taking into account geographical and topographical characteristics. As geographical classification systems should match the systems used for the presentation of statistics, it is often necessary to introduce a geographical coding system into administrative surveys. Apart from that, precise rules for the collection, treatment and distribution of spatial statistics have to be formulated.

One basic problem in analysing statistics in a geographical context is the size differences and lack of homogeneity of the geographical units for which statistics are provided. Average size of local units (municipalities) in France is 15 sq km with an average population of 1,500. On the other hand, municipalities in, for instance, Denmark have an average 156 sq km and around 19,000 population.

Communication between experts in statistics, geography and geographical information management is essential for GISCO. Everybody involved must discover what kind of information is necessary and in which format, in order to produce meaningful maps.

"Managing a GIS is a specific job. Neither a statistician nor a data-processing expert can handle it on his or her own." Vital Schreurs feels this point was not fully understood inside the DGs or even Eurostat. That's why considerable resources must be devoted to raising awareness inside the Commission. Arne Ottestad is anxious that this technology could fall into untutored hands. "Many people consider that geography is like graphics. It's not so easy. It is crucial to know the colours to be chosen, the relevant level, the right number of classes etc. Mapping is not only putting nice colours on a piece of paper. Colours are anything but neutral."

"You can be partial by accident, just because you haven't followed the basic rules", confirms **Jan Byfuglien**.

"Officials need to be GI or spatially educated", stresses **Vital Schreurs**.

A whole debate and awareness raising comes into play in dealing with questions like:

- What possibilities exist for cartographic presentation of statistics (shades, symbols etc)?
- How must data be prepared to be usable in the GISCO system?
- Which class ranges according to data sets have to be selected, and what about the choice of title and legend texts and their consistency with textual parts of publications?

A users' guide on these topics is available to every person interested in mapping from GISCO.

A worrying absence

A general lack of standards for collection, handling and dissemination of geographic information is considered one of the greatest obstacles for supplying comparable and reliable information at European level. More harmonised and standardised geographical referencing of statistical information (addresses, postcodes and administrative and statistical units etc) is the basis for making geo-statistical information more comparable and usable.

The efficiency of a GIS, linking geographical data with descriptive attributes (the statistical data), depends essentially on good geo-referencing of the source data. Thus, the spatial code used to link data with the location to which they relate, as well as the boundaries as part of the reference data, are of great importance for a well-established GISCO.

Supply of basic geographical data across Europe is at present concentrated mainly in the hands of national mapping agencies (NMA). Their

Arne Ottestad (left) in discussion with Jan Byfuglien

products are rooted firmly in divergent national practices and policies. As a result, the major obstacle to both information market development and internal Commission use of GIS technology is the lack of harmonised geographical data sets.

There are well-established procedures of co-operation between Eurostat and NSIs. However, in general, the NSI of a Member State is administratively totally separate from the national geographical institute (NGI). Thus, to obtain the underlying geographical data (terrain features as well as digitised administrative boundaries), Eurostat must create a new network of partners.

Jan Byfuglien explains: "NMAs are organised in a different way to NSIs - often more commercially oriented. And they are very heterogeneous. In some countries they are part of the military infrastructure. Eurostat is building a bridge between statisticians and geographers - it's a hard job as they have two different attitudes."

There is no European geographical organisation whose role might be to co-ordinate NMAs in the way Eurostat co-ordinates the NSIs. So it's extremely difficult, if not impossible, for users to obtain harmonised European data sets.
"GISCO is actively involved in the movement towards standardisation", says Josefine Oberhausen, with many people supporting harmonisation of geographical data.

"Perceiving this lack of a central entity, CERCO (European committee of heads of the official mapping agencies) was created." Other actors on the international "geo-information-scene" are EUROGI, the European Umbrella Organisation for Geographical Information, and MEGRIN, a marketing consortium of 18 national geo-agencies.

Boundaries - a crucial point

The latter supplies Eurostat with the administrative boundaries for those countries with no official link between NSI and NMA, which is the source of further difficulties. Josefine Oberhausen says: "The question is how to integrate the MEGRIN limits (SABE) with Eurostat's regional breakdowns (NUTS). There is not always coincidence between administrative boundaries and statistical units. For instance, in some countries like Sweden and Finland, there is a problem with coastal zones. The administrative units include sometimes areas of the sea or inland waters (eg lakes), which makes no sense in statistics when calculating population density for that unit (see map). The same problem exits with mountains as in Austria, for instance."

The commune boundaries are taken from NUTS. A seamless Community-wide boundary database down to commune level is especially important in planning and monitoring application of regional policy. In particular, it will be used by the Commission within the framework of the European Infra-Regional Information System SIRE within GISCO.

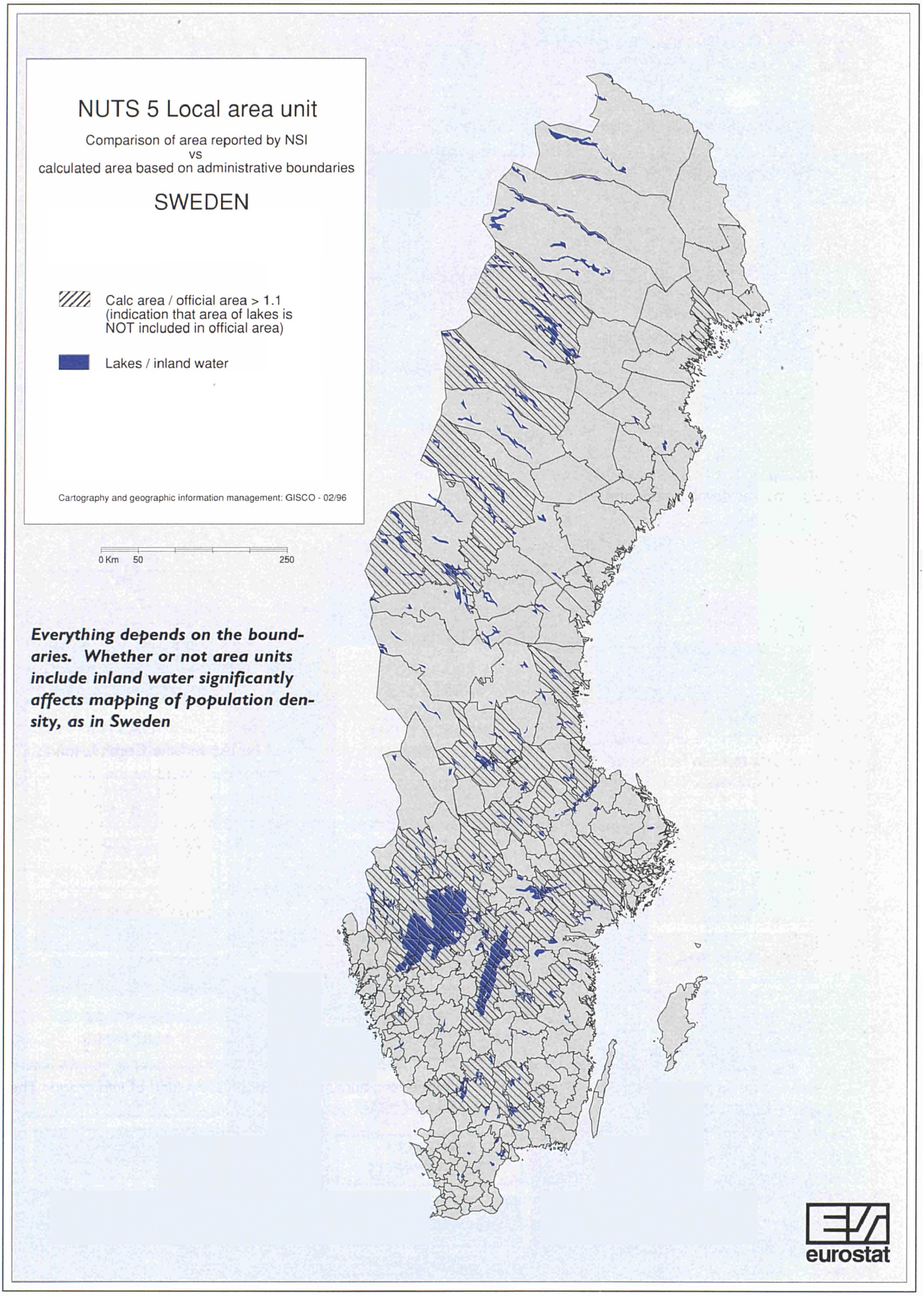
Towards a new network

Closer co-operation between NMAs and NSIs is arguably one of the key issues in improving the present situation.

"Eurostat is trying to encourage this. It is co-ordinating the first meeting of representatives from both in November '96 in Luxembourg. Eurostat would like this to be the trigger for setting-up such a network", Josefine Oberhausen explains.

Standardisation of geographical parameters and creation of a framework of NMAs and the Commission, as a major user, could be the first step in overcoming barriers to greater use of geographical information. To coordinate GISCO it is essential for Eurostat to construct, with NMAs, a new network to obtain information for its policy support activities.

Further problems for GISCO are differences between European countries on the nature and enforcement of copyright laws for different geographical data sets. This is also linked to differences in the level of commercialisation of this kind of information. The tendency in some countries to push mapping activities towards cost recovery and the private sector makes it, according to Jan Byfuglien, much more expensive to build consistent European geographical data sets, and restricts access to such information.



Everything depends on the boundaries. Whether or not area units include inland water significantly affects mapping of population density, as in Sweden

GISCO project structure

The diagram below shows the GISCO project structure. The project is split into seven areas of activity: database management (DB), map production (MP), spatial analysis (SA), desktop mapping (DM), data dissemination (DD), product development (PD) and production site management.

Some of these are very much related to data; others are strong orientated to informatics infrastructure.

The GISCO reference database is the core. Other building blocks are related to it.

Map production is based on the GISCO reference database. Only quality-assured, well-described reference data can be used.

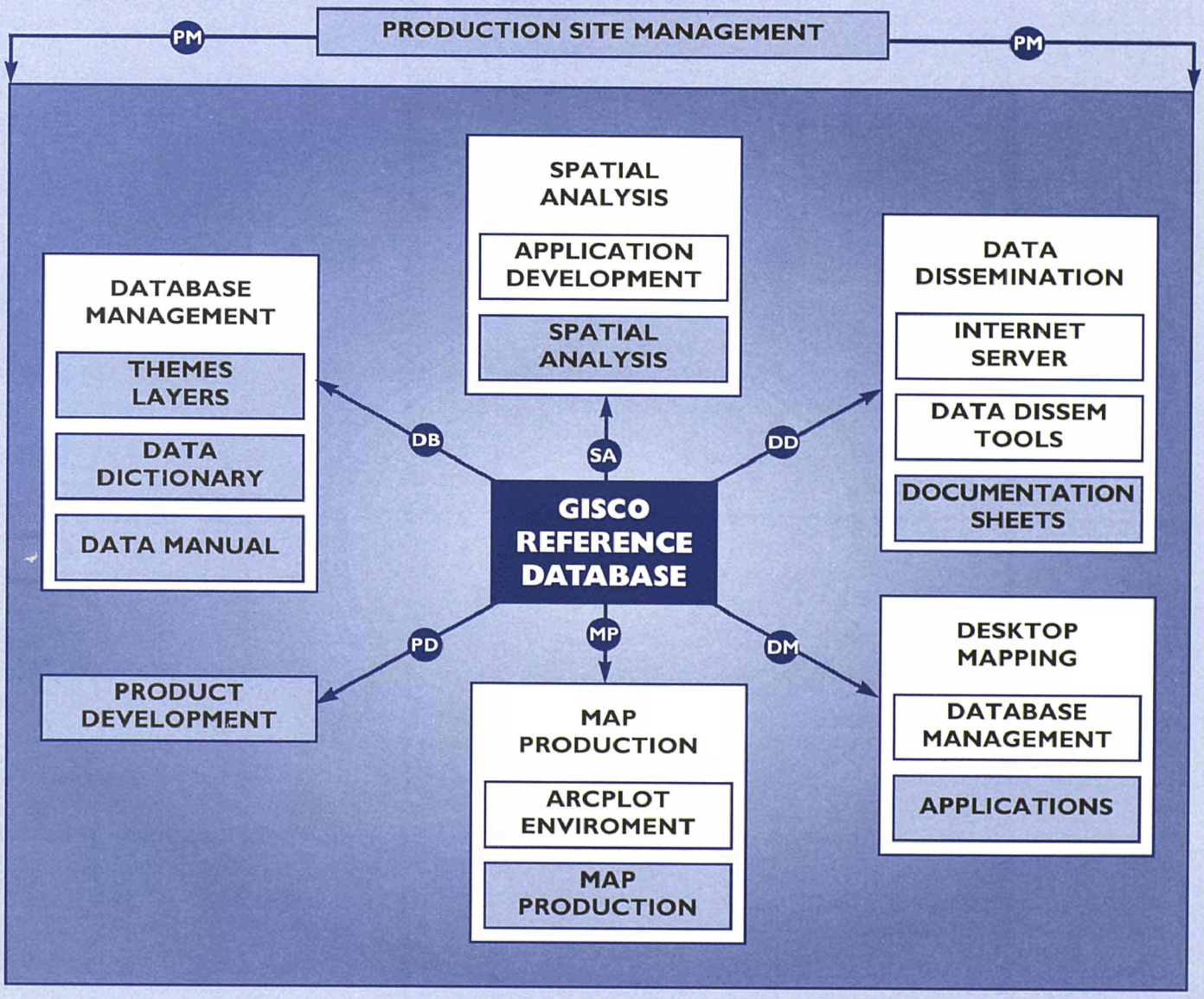
Spatial analysis combines different data sets. Applications are developed to automate this kind of analysis.

Ultimate goal of desktop GIS environment is to provide the user with appropriate tools and knowledge to create his or her own GIS environment.

A subset of the GISCO reference database is available for dissemination. This includes data dissemination packages with accompanying documentation. Dissemination via the Internet is also being considered.

One possibility is disseminating GISCO data in a more product-oriented way eg on CD-ROM with a visualisation and analysis tool.

Production site management can be considered a general activity area.

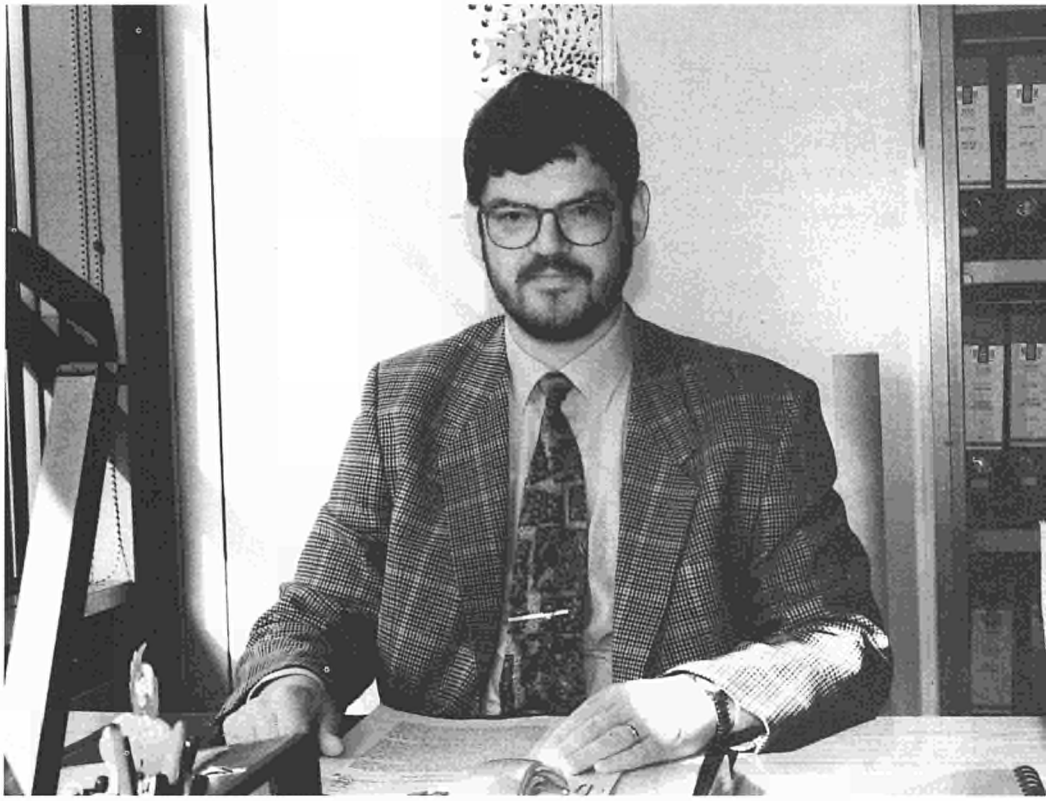


Widely appreciated service

Usefulness of maps as a communication, validation and display tool has become increasingly obvious and appreciated inside Eurostat and the Commission generally, as well as in the outside world.

The German Ifo-Institute for Economic Research asked GISCO for maps of Europe showing pollution as a supplement to a report it was preparing for the Commission's DG XI - Environment. Only GISCO was able to provide these special data. And the most important thing - the client was very satisfied with the result and "especially pleased with the excellent understanding of my needs."

"Quick and efficient" was the judgement of a Spanish company on requesting data from GISCO.



Vital Schreurs is a geographer specialised in socio-economic geography, cartography and GIS. He joined Eurostat in 1991 after working in the CORINE programme since 1987

Increasing demand

In addition, various departments and units of Eurostat and the DGs are more and more calling upon the map production capacities of GISCO. Demand has increased remarkably. Regional, agricultural, energy and transport statistics are GISCO's major "clients". But all Eurostat services occasionally request maps.

The framework of actions on regional planning (DG XVI - Regional Policy) requires not only factual data in the form of statistics but also data on geolocation. It is increasingly necessary to take account of the regional component of national and supranational initiatives. GIS techniques enable users to identify and evaluate this regional aspect, for example, to identify regions eligible for particular classes of EC support. Services in the field of regional policy are therefore one of the main clients for GIS applications.

Implementation of transport policies requires detailed knowledge of transport networks and infrastructure etc. GIS enables, for example, construction of accessibility models based on the exact location of networks.

Within the agricultural sector there is demand for information to manage the Common Agricultural Policy (CAP), production monitoring and rural planning and environment, some needs being very detailed.

Environment is annother sector with large demands on data covering many subject areas on a detailed geographical level. These may be quality of air, water, soil and wildlife etc, as well as data showing pressure on the environment, such as emissions.

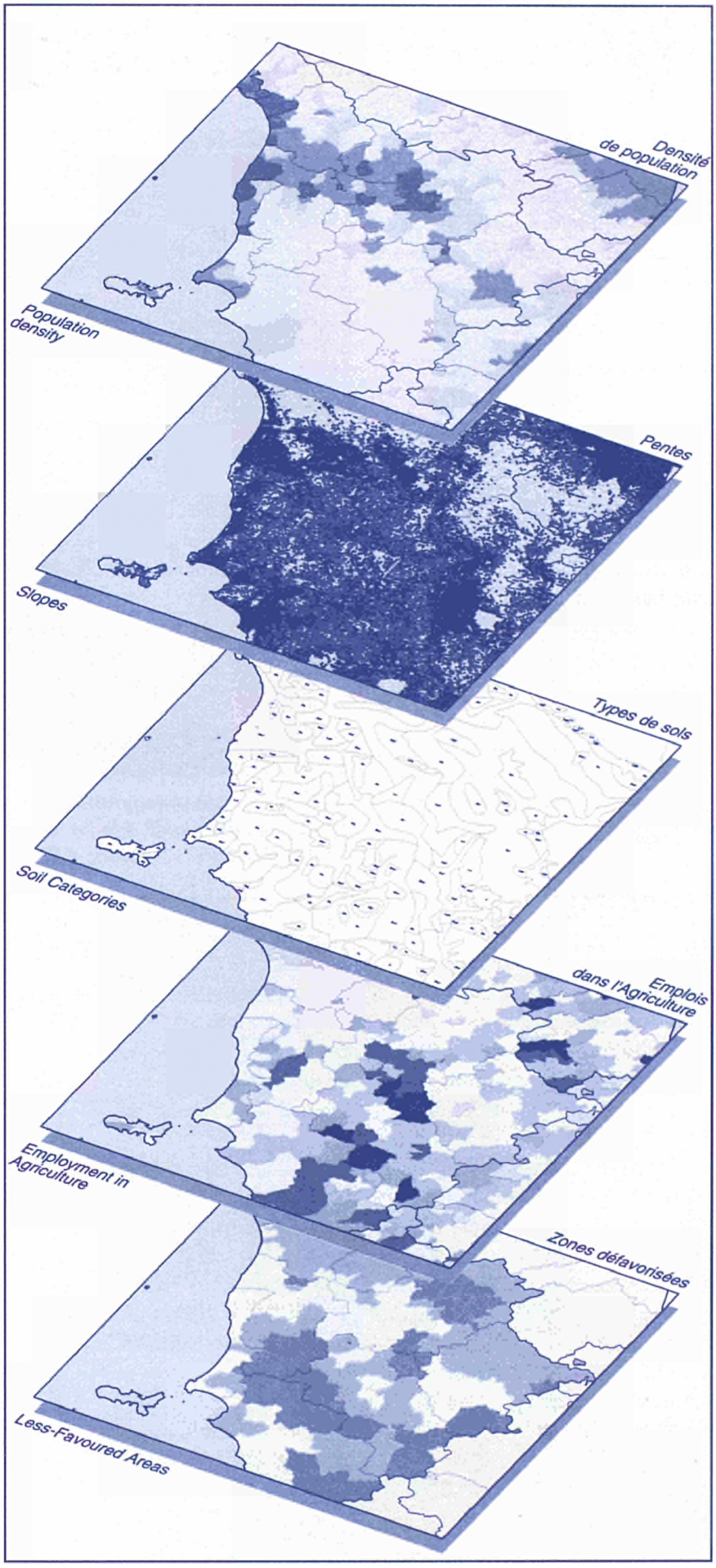
Examining interactions

The advantage of working in GIS is that it is possible to "zoom in" on particular regions and combine the information to examine interaction of different policy initiatives at various levels of

regional detail. This is of great importance in assessing the impact of regional policy initiatives on other EU policies and in the environmental area.

Cartographic work has been used in a number of Eurostat publications, including Regions - Statistical Yearbook, Europe in Figures, Eurostat Yearbook, Demographic Statistics Yearbook. This shows but a small range of the topics GISCO is dealing with. Moreover, GISCO's data are integrated in some external products like the CD-ROM RegioMap (statistical topographic software of the regions of Europe) and the Atlas GIS (socio-economic data on maps of Europe and the world).

As GISCO cannot produce all maps requested, the aim now is to help the Commission's services to make their own thematic maps. Thanks to more user-friendly software, some services will soon be able to do this, environmental statistics being a pioneer. GIS technology is very expensive. Setting up a full GIS site for two experts and equipped with two workstations in a DG and financing the first two years amount at least to 500,000 ECU, Vital Schreurs estimates. The Directorate-General for Regional Policy (DG XVI - Regional Policy) is in the course of acquiring such a system in one of its divisions. An alternative is to offer a desktop GIS environment on a PC. But, of course, comparing a workstation site with desktop GIS is like comparing a 25-tonne lorry and a 2 CV!



A big advantage of GIS is that enabling new information to be derived from combining different characteristics of population density, slopes, soil categories and employment in agriculture

What the future might bring

Though new geographical information technologies and applications are developing rapidly, future growth in Europe is hampered by major differences in the way such information is collected, stored and distributed in different countries and sectors of government and commerce.

There is no European policy on digital geographical information, neither are there operational standards for data definition and exchange, nor readily available basic data sets, supporting technology and knowledge infrastructure.

Growth of pan-European applications and cross-border projects is severely limited by availability of European-wide quality data at affordable prices; different national approaches and standards; and political and legal issues. Because of lack of standards, the costs of data conversion may be more than double those of data purchase, imposing a large burden on users.

What is required is a policy framework for a European-wide set of agreed rules, standards, procedures, guidelines and incentives for creating, collecting, exchanging and using geographical information.

DG XIII - Telecommunications, Information Market and Exploitation of Research - is therefore exploring the possibility of Community action towards creation of a European Geographic Information Infrastructure (EGII).

Main political actions needed are:

- Agreement of Member States to set up a common approach to create European base data, and to make this generally available at affordable rates. This must include the adoption of the newest co-ordinate and projection systems on a Europe-wide basis.

- A joint decision to set up and adopt general data creation and exchange standards and to use them.

- A joint decision to improve the ways and means for both public and private agencies and similar organisations to conduct European-level actions, such as creation of seamless pan-European data sets.

- Agreement and actions to ensure European solutions are globally compatible.

Because no existing organisation has the political mandate to create geographical information policy at European level and in order to bring this process forward, the European Commission is seeking this through the Council.

Once this has been obtained, the Commission intends initially to set up a GI2000 Task Force composed of top people from the European geographical information industry and the user community, as well as senior officials from Member States' Ministries, chaired by a Commission representative.

And GISCO?

As for the project GISCO itself, Josefine Oberhausen thinks it should now focus on:

- Multiplying the tools to facilitate DGs' access to the database.

- Improving dissemination through new products and the Internet.

- Training and supporting statisticians willing to produce their own maps. This will reduce the burden on the GISCO team.

- Becoming a centre of know-how.

- Developing spatial analysis.

- Expanding the reference database.

Vital Schreurs insists on the need to improve the database, which could be more detailed, harmonised and standardised, and on making Eurostat and GISCO more visible. "Today this 'treasure' is not accessible enough", he thinks. "The first years have been dedicated to data collection and database construction. It is time now to have the database much more exploited by the user-administrators of the Commission and to make it available to the outside world."

For further information on GISCO services and products please contact:
Eurostat Data Shop, Luxembourg: Tel: +352-433-522-51, fax: +352-433-522-221
Eurostat Data Shop, Brussels: Tel: +32-2-299-66-66, fax: +32-2-295-01-25

Environment: where European statistics and geography became engaged

by John Allen

Much environmental information has a very obvious spatial or geographical component. The original data on the quantities of a pollutant emitted or on its concentration will normally refer to a specific site or river. Using this spatial information, and at the same time linking these data to other kinds of statistics which refer to administrative entities, has been a major task for environment statisticians for the past decade. The idea of building a GIS centre in the European Commission started with the end of the CORINE programme, - Coordination of Information on the Environment.

The CORINE programme

In 1985 the Council adopted a Decision on the CORINE programme intended both to stimulate the production of data in Member States and to set up a computerised information system capable of storing, manipulating and presenting spatially-related data alongside other statistics. While there is some debate on whether CORINE achieved all its original objectives, there is no doubt about its influence on the development of environmental information at EU level. In particular, the organisation of the European Environment Agency (EEA) and its network of specialised Topic Centres and National Focal Points is partly based on the organisational model used in CORINE, and several CORINE actions have been continued as EEA projects. In Eurostat, the GISCO system (see article on page 4) was set up to continue the work of CORINE on the compilation, maintenance and distribution of core cartographic datasets.

The recent Dobris Report gives many examples of the kinds of data collected during the CORINE programme. Information from some 45 countries on land use, river water quality, emissions of air pollutants and wildlife habitats for the whole of Europe is presented in the form of maps, giving an immediate visual argument to support the analysis of environmental problems in Europe. In addition, maps are used to present detailed datasets used as examples, such as the distribution of the threatened peregrine falcon. Underlying these maps are many databases containing geo-referenced environmental data; that is, each data record includes either spatial coordinates (usually latitude and longitude) or a reference to a site or area whose spatial coordinates are held elsewhere.

Uses of geo-referenced environment data

Presentation of complex datasets in maps - probably the most visible use of geo-referenced environmental data at present - would not by itself justify the investments made in these databases and in the computer tools - Geographical Information Systems (GIS) - needed to work with them. Other uses fall into two broad categories. First, environmental management at a local or national level needs spatial environment data, since this information forms part of the input to the physical planning and management functions of local and national authorities. In particular, environmental impact assessment is facilitated by access to detailed geo-referenced environment data, which can be used alongside other geographical information on topography, geology, housing and transport infrastructure.

Environmental Impact Assessment (EIA) is the procedure by which the environmental risks of projects are evaluated before construction or development permits are granted. EIA normally involves the review of environmental information on site and exploration of technical options for mitigating environmental damage. EIA for certain categories of large projects is required by Council Directive 85/337/EEC, but in some countries it is part of the normal physical planning process for a wider range of projects.

Analytical applications of spatial data are perhaps closer to the statisticians' world. Here, geo-referenced environmental data, together with other statistics, are used as input data for algorithmns which calculate new variables, perhaps new statistical indicators, or transformations of existing indicators on a new spatial framework. GIS software makes possible all kinds of spatial analysis, including calculations which combine point or line attributes (which would include many environmental data) with area attributes, for example population density or GDP. It is also possible to transform data collected according to one spatial framework on to another; for example, water data which refer to river basins can be transformed into attributes of NUTS regions.

The future

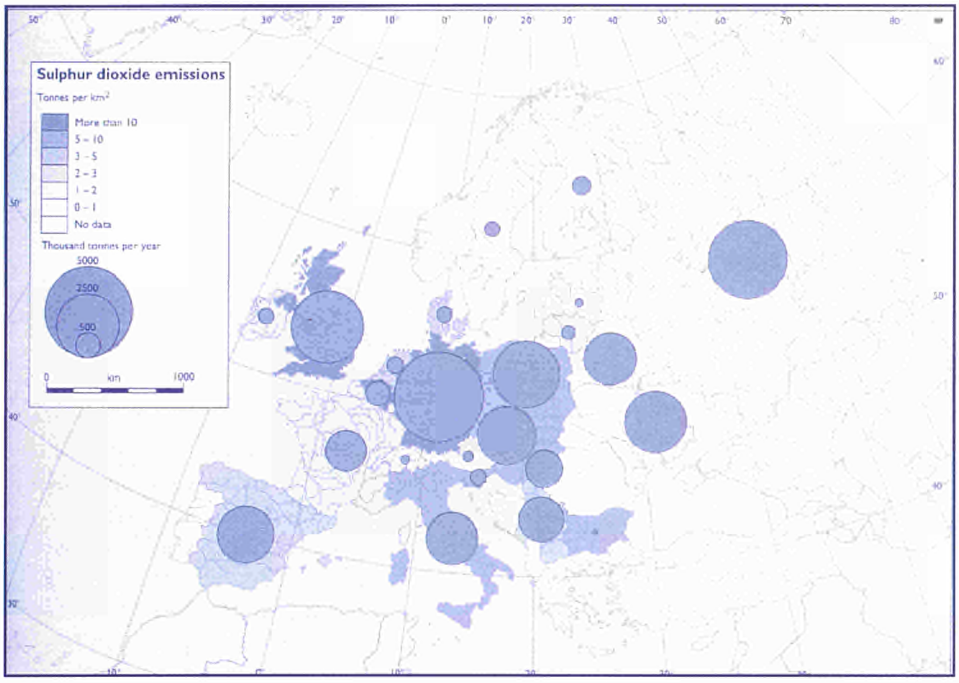
While statisticians working on environment data are very well aware of the existence of geo-referenced data and of the tools for working with them, it is probably fair comment that exploitation of such data is still underdeveloped. GIS are used routinely for the production of maps which present complex environmental datasets, and for data transformation but the normal output of environment statistics does not yet use the analytical facilities of GIS to any great extent, although new applications are appearing regularly.

In future, easier access to GIS and the wider distribution of standard geo-referenced datasets should mean that statisticians will have more opportunity to use the analytical facilities of GIS. A much wider range of applications can be expected in the regular output of environment statistics. In particular, one could expect new classes of indicators measuring areas influenced by urbanisation and transport infrastructure, and new measures of population exposure to environmental pressures and levels of environmental quality.

Further reading

EEA (1995). Europe's Environment: the Dobris Assessment. Office for Official Publications of the European Communities. ISBN: 92-826-5409-5. Catalogue number: CR-80-93-339-EN-C. Price: 55 ECU.

Eurostat (1995). Europe's Environment: Statistical Compendium for the Dobris Assessment. ISBN: 92-827-4713-1. Catalogue number: CA-82-94-488-EN-C. Price: 25 ECU.



▲ *The pan-European state of environment report - the so called "Dobris Assessment" - published in 1995 by the European Environment Agency, presents many complex environmental datasets using maps. This map of European SO2 emissions shows both the total emmisions for each country (in tonnes) as well as the density of emissions (tonnes per square kilometre)*

◀ *John Allen works in Eurostat F3 - Environment Statistics*

Censuses can be an important application of GIS. In preparing the 2001 population census, the EU countries, with some others, are debating the best methods to be used. Eurostat is playing an important role.

The geographic dimension of a census, as viewed by Eurostat

by Fausto Cardoso

Two recent workshops - one in Vienna in June 1995, the other in Berne, in March this year - saw a limited number of countries focusing on the use of geography for census: definition of a basic geographical unit and use of Geographic Information Systems.

Diversity in national census practices

Comparison of the countries' practices shows different ways of organising national population censuses. Censuses range from traditional census-taking by enumerators or by mail to fully register-based operations. As a consequence, the basic geographical units vary very much in size and concept.

Address registers (see article on Nordic countries, page 25), often the basis of Nordic censuses, are not always easy to build up and maintain.

Demand for data on cross-border and small geographical regions is increasing. Such zones do not fit into administrative areas. In the EU, cross-border regions are of increasing importance. Providing data for these lies in the hands of Eurostat. Statisticians in charge of censuses generally agree on the need for basic geographic units. Such units should serve as building blocks for enumeration areas (for the administration of censuses) and output areas of different size (administrative areas or the enumeration, user-defined areas) better adapted for analysis purposes. These areas, the so called "functional zones", such as "travel to work areas", "urban areas" or different types of catchment areas, are of great importance in the framework of regional planning, socio-economic studies, environmental impact studies etc. When setting these areas in an international context the question of dimensional (area and population) harmonisation becomes a key issue. The solution seems to be to agree on a territorial unit of intermediate size between the enumeration district (smallest unit used to collect the census data) and the NUTS 5 unit (smallest administrative unit normally used to produce statistical data).

A general use within the European statistical system of such a type of territorial unit would enable this system to handle a very important and increasing demand for "micro" statistical information, particularly for highly accurate "geo-referenced" data. However, currently different concepts and methods are applied to delineate districts. Some use the postal code, others a range of addresses comprising a different number of households. In some countries, the delineation of boundaries is integrated or planned to be integrated into a computer-based system. The objectives are to replace the manual drawing of boundaries on maps, to facilitate the administration of the census and to guarantee flexibility to treat raw data and produce output data adapted to user needs.

Which kind of geo-referenced data should Eurostat promote?

With coordination and harmonisation as its mission, Eurostat is concerned with developing a geo-referenced system homogeneous enough to allow representation and comparison at European level.

There are three main directions to this work:

❶ *Encouraging the use of a homogeneous digitised cartographic base or, at least, one easily compatible through scales and projections.*

❷ *Encouraging construction of a homogeneous, easily compatible geo-referenced system. Such compatibility is needed at international level for cross-border work and to make possible the use of various statistical data sources from different countries.*

❸ *Facilitating harmonisation of basic geographical units used to make the geo-reference.*

Eurostat is considering the creation of a standardised territorial unit to be generally used in the treatement of census data as a "basic unit" - a major issue. In the case of indirect geo-referenced systems through small territories, generally named polygons that can correspond to census sectors, postal areas, administrative divisions etc, Eurostat wishes Member States to use a small-size basic unit. This would allow major flexibility in the delimitation of analytical functional units (urban, employment zones, catchment areas) by regrouping these basic units. A specific difficulty lies in areas of low population density: in such cases, basic units can sometimes be too large and not suitable for certain analytical needs.

On the other hand, in densely-populated areas the statistical information is sometimes on an extremely large population group, perhaps several hundred thousand people. It is also necessary to determine the type of link (address, geographical coordinates) between the statistical object of the survey (household, individual, company etc) and the cartographic representation of the reference basic unit.

How to cope with the evolution of the territorial breakdowns over time is another important obstacle to be overcome.

In fact GIS, the appropriate tool for the management of these data, has a great deal of difficulty in following changes in time of the territorial limits of the administrative units and in particular of these polygons. One can however expect that the extent of this problem could be significantly reduced if the territorial breakdowns are the result of the aggregation of a large number of smaller units.

The need for standardisation and coordination is therefore enormous. There is in fact an increased use of functional zones in which territorial breakdowns do not coincide with administrative areas. Functional zones are needed for political and economic decisions and socio-economic analyses.

Such questions, relatively well answered at national level, are less so at Community level. However the lack of maintenance over time of a territorial geo-reference pivot system makes dialogue between these systems quite difficult. Greater integration of EU national information systems should help to improve the present situation

Eurostat therefore aims at building a common system of geo-referenced information at the European level. It could be based on a common definition of the basic unit to be used in the next population censuses in 2001. A number of developed data-processing applications would also make easier the dialogue between the national statistical systems.

Daniel Rase (left) and Fausto Cardoso, Eurostat E4 - regional accounts and indicators, structural plans

Eurostat wishes to stimulate the development of GIS

The tools for statistical and cartographic data processing are today so powerful that they open a new and wide range of possibilities, in particular in the field of population censuses. They make feasible the realisation of systematic data-processing based on territorial breakdowns of enormous flexibility, provided the necessary information is available in the system.

International organisations like Eurostat have to take into account the possibilities of increasing the value added that geographical information may generate, especially when there is a sufficent level of harmonisation internationally to allow treatment of data across borders.

GIS techniques offer many advantages which should encourage their use in statistical institutes. They facilitate the updating and printing of maps and make their use and storage more flexible. They can be used for delineating enumeration areas. They offer greater flexibility for ad hoc analysis on a territorial basis thanks to a computer-based system. Consequently, they offer increased possibilities of using data sets from different sources (surveys, registers etc). It has to be said that financing GIS projects has sometimes proved a problem; this explains why some statistical institutes have only recently started their own GIS. This investment is nevertheless worthwhile as GIS systems reduce the costs of census planning and field work, and shift work from manual to automated operations.

Eurostat is very much concerned with the development of GIS in Member States, in particular in the framework of statistical applications like population and agricultural censuses. It expects to play its role regarding standardisation, in order to set common standards for definitions, naming and coding practices etc.

Statistical maps on information superhighways

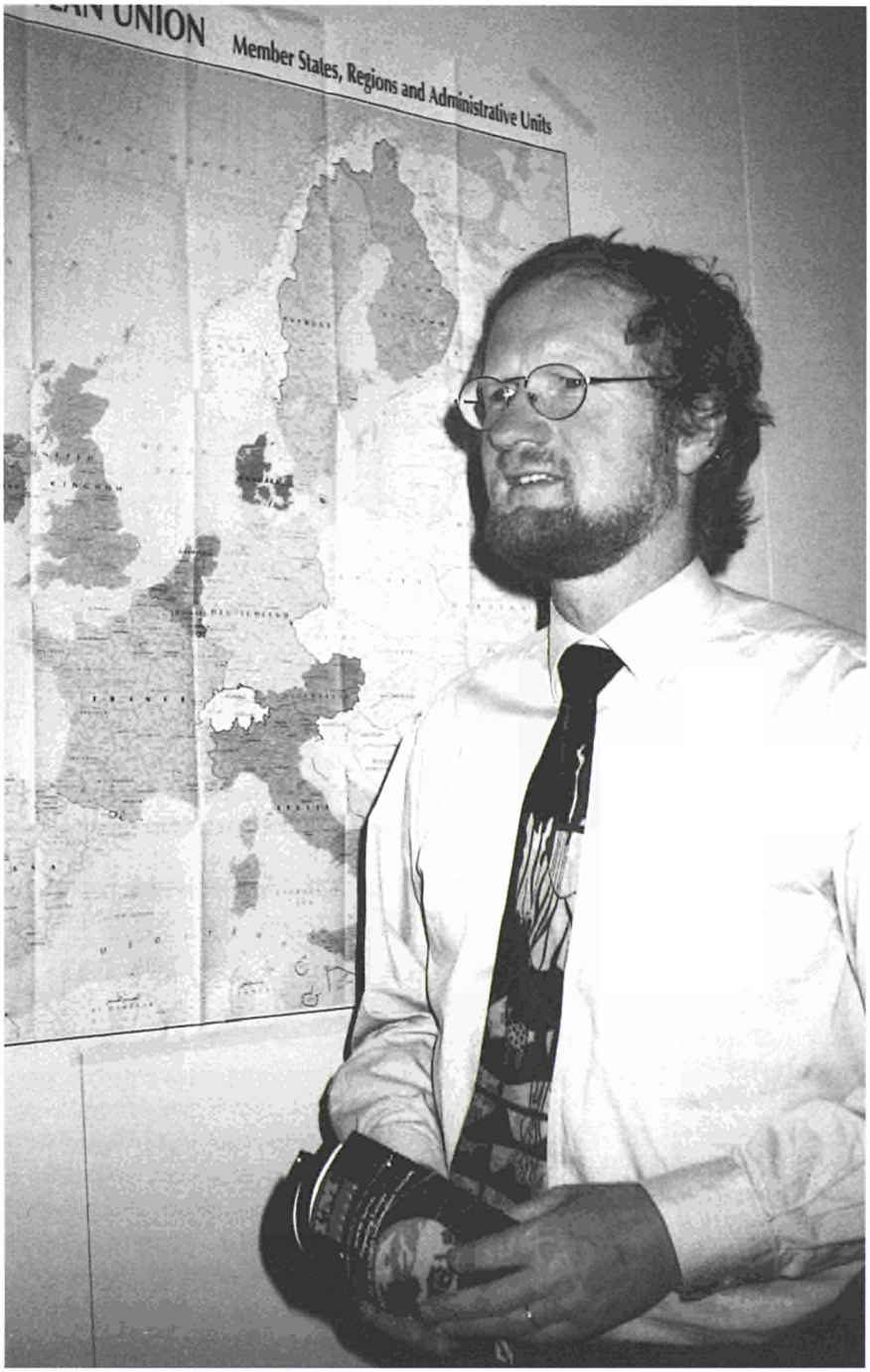
Jean Drappier in discussion with Werner Janusch and Steve Power

An extensive and easily accessible platform containing top-quality basic data in standard format throughout Europe, with access to each market niche by any entrepreneur... this is the plan of the European Policy Framework for Geographic Information: a platform that can take existing data and mould them into usable sets, while allowing new data to be added easily and promptly.

This objective can be found in the massive INFO 2000 programme launched by the European Commission. With its GI 2000 identifier, it is an important component of the content scheduled to cruise along the new information superhighways.

Europe cannot fully exploit all the potential benefits of the information society unless the information content sector flourishes. In emphasising all these benefits and announcing the action lines of INFO 2000, European Commissioner Mr Martin Bangemann said they have to be made available and accessible to the enterprises and citizens of Europe.

It is with this in mind - explains Werner Janusch, project officer in DG XIII of the Commission - that GI 2000 will endeavour to



Werner Janusch, DG XIII - Telecommunication, information market and exploitation of research

promote a whole series of common rules, standards and procedures for the collection, exchange and use of geographical information, and for the actual compilation of such information. The European Policy Framework for Geographic Information should ensure that sets of large European data bases are speedily accessible and accompanied by the necessary metadata so potential users can find and understand the information.

This is why the INFO 2000 programme aims to make the fullest possible use of all public information in Europe including statistics. The public sector contains an enormous amount of information, of inestimable value to both individuals and enterprises.

But much is hard to obtain. This is where incorporating the spatial dimension of the European statistical system in a geo-referenced format makes such data much more user-friendly for both producers and users.

Geo-friendly and "intelligent"

Economic, social and natural events and phenomena all have a spatial component. It is a primary method of arranging statistical information on - and usually linked to - geographical territory, enabling very effective presentation.

A geographical information system needs to be "intelligent", combining the most advanced computer techniques, digital processing and spatial analysis - encoding, storing, processing, maintaining, analysing and presenting data by relating them to their geophysical location ie geo-referencing.

Software designers have realised this and are increasingly using cartographic or geographical tools to make their products more user-friendly.

Partners in Euripides

Euripides - the European Information Project Involving Demographic and Economic Statistics - was a project under DG XIII's former Impact programme (Information Market Policy Actions). It is a pan-European database on smaller regional entities and provides national, regional and local information covering 17 countries in Western Europe.

Users can select and compare data in about 35 categories and study population, economic and topographical features of more than 100,000 census districts throughout Europe.

Euripides is managed by a consortium of private partners, specialists in geo-demographic information and various research centres. Also involved are three national statistical offices: the Irish Central Statistics Office (CSO), the Office for National Statistics in the UK (ONS) and the Dutch Central Bureau of Statistics (CBS).

It is the first project of its kind enabling European-wide comparison of, for example, "communes" in France, "municipalidades" in Spain and "constituencies" in England and Wales.

Data on data

In this complex interplay of geographical, demographic, historical, cultural and economic information, the idea is not simply to describe administrative borders but also to show how central bodies collect and process these data.

This is why many national and international agencies are working with Eurostat to establish and introduce standards for collection, storage and dissemination of data throughout the continent. But there is always the legacy of history, which results in many clarifications and metadata.

A pragmatic view

Euripides project manager **Steve Power** takes a pragmatic view: "We are trying to produce something close to a homogeneous set of data. But we are not trying to play around with the statistics: we provide enough metadata - information about information - to enable users to understand the differences between data of various countries."

Like all Eurostat statisticians who argue for geographic information systems and realise their systematic use requires tremendous coordination - not only on software but also and primarily on the data processed - **Steve Power** is fully aware that "obtaining the agreements of 17 or 18 statistical agencies is a job in itself."

A trend European statisticians can't ignore

by Fausto Cardoso

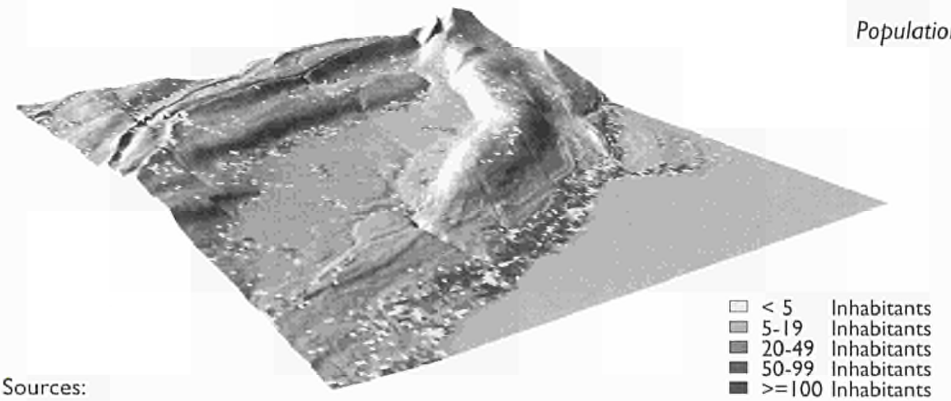
Recent developments in communications mean people are less and less tied to their territorial base. This trend is fuelling a growing need for micro-information, especially of a detailed geographical kind. The European statistical system cannot ignore this trend.

In addition, technological developments, especially in data-processing, have facilitated handling of the huge mass of information such applications demand. Everywhere in official statistics initiatives are being developed for processing extremely detailed geo-referenced information, with small-scale geographical coordinates or reference grids covering areas ranging from just hundreds of square metres to a few square kilometres.

Circumstances naturally vary tremendously from country to country. A small number, especially the Scandinavian countries and Switzerland, have introduced systems based on the geographical coordinates of buildings. These systems are usually suitable for the fairly comprehensive use of a range of geo-referenced data using geographical coordinates.

Other countries, such as the United States, Canada, France, Italy, the United Kingdom, have adopted - or are doing - an intermediate geo-referencing solution. This uses, as the basis for spatial reference, the territorial districts of population censuses. Computerising the procedures involved, which obviously affects choice of distribution units, provides a unique opportunity for harmonisation under ideal conditions. At world level, the United Nations is involved in a series of initiatives along these lines. Eurostat, at the heart of the European statistical system, is also pushing for national solutions that are compatible.

The ability to compare different information sources and store data over lengthy periods, and the facility to process and use the data, are major challenges for official statistics as the century draws to a close. Use of new sources and enhanced capacity for exploiting traditional sources provide tremendous opportunities for improving data coverage and reliability. This means statisticians have to comply strictly with professional rules, guaranteeing respect for privacy and individual rights while ensuring that information is transparent and processed with the utmost care.



Neuchatel region

Population density 1990 per hectare

Digitally-generated relief with hectare data from the 1990 census. From mid-1998 onwards the town of Neuenburg, on Lake Neuenburg, will be new location of the Swiss Federal Statistical Office

Sources:
Terrain model: DTM25 © Federal Office of Topograpy, Population data: Census 1990, SFSO GEOSTAT
Reproduced with the permission of the Federal Office of Topograpy from 24.7.1996

The Swiss case

Where geography and statistics enjoy a happy marriage

by Martine Kleinberg

We all know Eurostat, but what about GEOSTAT? Outside the EU but among the best users of GIS as applied to statistics.

GISCO is a part of Eurostat. GEOSTAT was created inside the Swiss Federal Statistical Office in 1987, five years before GISCO's own birth. This marriage of statistics and geography has since 1993 been enshrined in a Federal statistical law. According to this, nearly all data contained in and analysed with geographic information systems are considered as statistical data.

A service-oriented structure

The Federal Statistical Office (SFSO) has tried for many years to assemble a solid base of geo-referenced data; to explore the capabilities and potential of available geographical information systems for the management, analysis, presentation and diffusion of GIS data; and to satisfy the needs of a wide range of interested data users. The SFSO has been considered the ideal location for a general data repository and this encourages the cooperation of data producers by offering technical and marketing advice and relieving them of administrative and legal burdens.

In 1976 the SFSO started establishing geo-referenced statistics independent of the traditional administrative boundaries. At that time the regional geographical database maintained by the Institute for National Regional and Local Planning of the Swiss Federal Institute of Technology in Zurich was transferred to the SFSO in Berne. Since then, what is called the "information grid" has been systematically expanded. Increasing amounts of data, growing data needs and requests, technological advancements in computer hardware and software and data processing methods led to a complete redefinition of the project. Finally, in 1987, the Swiss Interior Federal Department finally decided to establish formally inside the SFSO the GEOSTAT project.

Today, the GIS of GEOSTAT not only contain points and grid data with a resolution of 1 ha but also several vector data sets. GEOSTAT is now able to prepare analyses of combined data sets efficiently and fast.

GEOSTAT's mission still consists of the five original objectives:

❶ Integration, administration and maintenance of different geo-coded, spatially-relevant data available in the Swiss Federal Administration.

❷ Integration of geo-referenced data from other data-owners.

❸ Processing and analysis of available data according to the specific requirements of users, as well as advice and support of users.

❹ Cooperation with researchers and institutions to develop and test analytical methods.

❺ Coordination, guidance and help for data collection, digitisation and utilisation, as well as for the establishment of individual GIS infrastructures, especially for Federal Government institutions.

The grid: an original way to present data

Currently available data cover multi-purpose needs of a majority of users. They offer a multitude of interesting and challenging analyses to user communities in Federal, cantonal and local administration, research and education, and a large number of private consultancies in the fields of planning, the environment, agriculture, sociology etc.

Main categories offered are:

Administration (administrative boundaries)
Topography
Geology
Hydrology
Land cover, land use
Population
Transport
Planning
Protected areas.

Thematic cartography is a classic means of providing a rapid overview of statistical data in spa-

tial terms, encouraging the comparison of structures and developments. Traditionally, statistical data (absolute figures, percentages, variations, rates etc) are aggregated at territorial unit level (country, canton, district, commune). However, these territoiral units are defined by political and administrative boundaries which often differ in size and importance.

Two solutions specific to geographical information systems make it possible to go beyond the limits of traditional cartography:
**** Presentation of data by basic statistical units.***
**** Presentation of statistical units according to their position in a grid (hectare, square kilometer, acre).***

All GEOSTAT's geo-coded statistical information can be presented within the framework of an hectometric grid. The comparative advantage of the grid lies in the possibility of combining hectometric data with other geo-coded information such as relief, road networks, public transport, social infrastructure and construction, industrial or protected zones etc. The GIS also offers the possibility of defining arbitrary and flexible spatial aggregations specific to the problems investigated.

Advantages of combined data analyses to protect the environment

The use of a GIS allows data combinations of particular use in planning.

One example is the potential conflict between population and the environment.

The Federal inventory of landscape and natural features of national importance describes around 120 sites enjoying certain legal protection. Their present characteristics are to be preserved and their exploitation restricted. A comparison with the existing network of Swiss national motorways already reveals many potential conflict areas. Altogether more than 60 kms of motorway intersect these semi-protected areas. These motorways threaten their visual beauty and expose significant parts to pollution and noise. Further implications of modern civilisation for such areas could be analysed by superimposing railway lines or populated areas of medium and high densities on to maps.

A similar investigation, on the micro or cantonal level, shows potential conflict between nature protection and tourism. Highland wetlands are now protected by law and have been digitally mapped. In the canton of Obwald, hiking trails and footpaths have also been digitised for a special project. A combination of the two data sets reveals that many trails are touching or even crossing such protected upland moors. This may be quite desirable from the point-of-view of tourism. However, negative effects on the delicate natural balance and the sensitive flora and fauna in these wetlands are likely.

GIS for census: every building to be geocoded

Population data are provided by national censuses of population, buildings and dwellings organised every ten years by SFSO. Through an elaborate process of geo-coding, geographic coordinates are assigned to residential buildings, integrated to each building registering and to the computerised register of census data. The relationship between buildings and the census of persons is established by a unique building number. In the 1990 census geo-coding of residential buildings was organised for the first time as a compulsory, full-scale effort, resulting in geo-referenced census data covering the entire country. Up to 10 staff of the SFSO worked on geo-coding from 1989 to 1993. The transfer of around 400 standard variables into the GIS of GEOSTAT now allows analysis of census data according to arbitrary spatial parameters. It also enables combination of these data with other, such as land use types, legal construction zones etc.

A considerable demand for digitisation and geo-coding of other information has been identified in past years. The major task now is the ongoing census of business and enterprises which envisages geo-coding relevant non-residential buildings as well. For that purpose, coordinates for all places of work and for houses built since 1990 for the same utilization have to be established. This is done through various procedures, based on cadastral survey plans, local plans, national maps and building registers.

Coordination to be intensified

It is clear to the SFSO that GIS are a highly-effective tool for planning and managing sustainable development. Thanks to such systems, it is possible to build models, analyse complex relationships between population, spatial mobility, production methods and the environment. GEOSTAT aims to improve coordination of data generation, management and assessment. Duplicated efforts could be thus minimised; comparability and compatibility of different data sets or thematic layers enforced. But success can only be achieved by continuous discussion. GEOSTAT intends to encourage more and more data owners - Federal and local authorities and even private enterprises - to make use of its services and permit the integration of their own data into the GEOSTAT database. In coming years SFSO will also concentrate on the utilisation of satellite remote sensing data.

The Nordic case

Key words in Norway: registers and basic units

by Martine Kleinberg

It seems mountainous countries are prone to using GIS in statistics. Switzerland, Finland, Sweden, Norway are all leaders in this field. Statistics Finland, for instance, introduced the first GIS with maps and statistics on localities in 1960. The Nordic countries, moreover, are keen on registers, which are used largely as a source for statistical data.

Sigma met Jan Byfuglien and Arne Ottestad, two Norwegians who work for the European Commission in Luxembourg. They are both from Statistics Norway. Arne is currently working for GISCO, where Jan used to be in charge till until 1995. Jan is now EFTA's statistical adviser for cooperation with the EU.

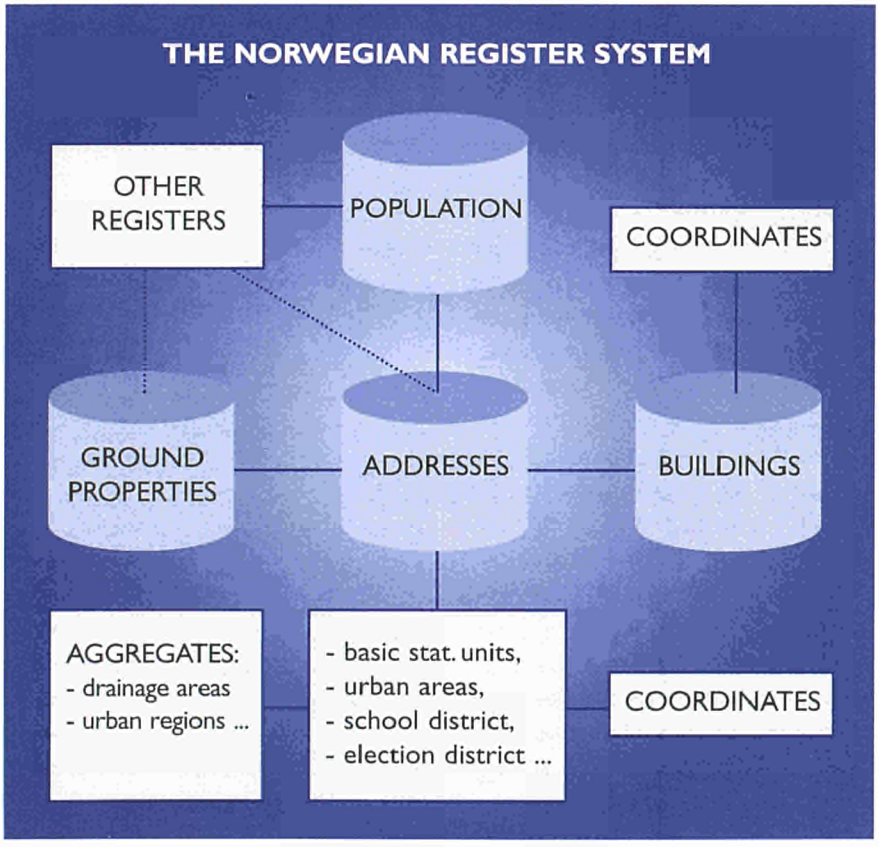
Nordic tradition

Registers are the main information sources for statistics in the Nordic countries. They are one part of the Norwegian solution for linking statistics to geography. But what exactly is a register? Most countries have registers but do not use them like the Nordic countries which long since developed registers for statistical purposes. Registers can cover population, buildings and dwellings, enterprises and establishments, wages and salaries, employment, income, educational achievements etc. For instance, the population register was originally a book recording all the inhabitants of a municipality. Nowadays, the term embraces a kind of permanent card index, one card established either for an individual or a household. It contains key data on the individual's civil status and by law must be regularly updated. In a census it might be used in place of or to complement the traditional questionnaire. In Finland the 1990 population census was the first example of data derived entirely from registers.

There are major advantages to the register approach:

* As they are made for purposes other than statistics (taxation, etc), there is no additional burden on the public.
* There is no limit to the frequency of extracting data from the registers.
* It allows retrospective studies.
* Costs are substantially lower for the statistical institute using existing data.

On the negative side, the statistician using registers might be limited: he or she cannot change the questions, which might not be always suited to statistical requirements. In the case of a census, two preconditions are essential: the registers must be centralised and of unimpeachable quality; and there must be a reliable system of inter-register communication based on the allocation to each individual of a unique identification number.



Statistics Norway makes great use of the GAB system: the integrated register system for ground properties, addresses and buildings.

Seen from a GIS/statistical viewpoint, the address register is the most important. It should contain official positioning addresses (mostly street names or codes plus house or entrance numbers). It also functions as a register of geographical areas - basic statistical units (enumeration districts), urban areas, school districts, election districts, parishes and even special local planning units. Coordinates may also be linked directly to buildings, ground properties and addresses. To a large extent this register system is now operational.

The address register may also be linked to a population register and other administrative or statistical registers containing a standard address identification. This link enables the production of statistical information for different geographical units. By linking these registers, it is therefore possible to produce "census-like" statistics on a regular basis.

The register system may sound like a "big brother is watching you". This overlooks the very democratic nature of Nordic countries. Jan sets our mind at rest: "The system is very regulated. You have to prove you need to match registers. It is very carefully handled, so that no one would be able to go to an individual person. The fact that each person has an identification number should not be seen as a threat to freedom but as security".

Statisticians have always the confidentiality of data in mind when they publish their results. Sometimes information is suppressed simply because it would give too precise information on too small a unit.

The basic unit: constructing analytical zones

The ideas of constructing a basic statistical unit as part of the address register goes back far into the past. Jan Byfuglien remembers when he worked on the breaking down of Norwegian territory 20 years ago! Basic units were actually established in preparation for the 1980 census, on the former enumeration districts.

They were defined with the local authorities, based on these principles:

❶ Basic units should be designed to be as stable as possible for a reasonable time.

❷ Basic units should be well documented on maps and through coordinate referencing, as well as by address descriptions.

❸ Area and population should not be too large and not show too much variation.

❹ Basic units should be as homogeneous as possible with respect to communication and building structure.

Municipalities were first divided into "statistical tracts" with more than 2,000- 3,000 inhabitants. These were further divided into basic units. There are now about 1,550 "statistical tracts" with an average population of 2,600, and about 13,500 basic units with an average population of 300. Norway has some 4.3 million inhabitants.

Arne explains: "Urban areas are deliniated and coded independently from basic units. Urban settlements should have a minimum population of 200 and the distances between houses should normally not exceed 50 metres. This means that basic units may be either urban, partly urban or rural."

The 1980 and 1990 censuses were conducted through a combination of register information and postal enquiries. This means that the basic units had no function as a tool for handling the enumeration process, but only for the dissemination and analysis of the census results.

When aggregated basic units make it possible to construct analytical units for different purposes and thus increase flexibility and user adaptation of statistics.

A catalogue has been established to aggregate basic units to a standard register of drainage basins. Although the boundaries of basic units do not often correspond exactly to the limits of drainage areas, the adaptation in most cases is sufficient for the presentation and use of statistics and for environmental studies etc.

Basic units have also been used for defining commuting zones and urban regions. They give much greater flexibility in defining real commuting zones than the use of municipalities, which may be rather large in area and/or population.

Another application was developing a measure for distribution of population within a municipality. Population distribution is seen as an important factor affecting municipal management costs and is used for central governmental support. Use of the simple indicator "population per square kilometre" has proven rather unsatisfactory, due to the varying settle-

Arne Ottestad (left) & Jan Byfuglien: Statistics Norway's experience in GIS and registers could be of interest to other NSIs

ment structure (where populations on islands or concentrated settlements are split by large uninhabited areas). To establish a new population distribution indicator, the distances between basic unit centres have been coded both as travel distance and as estimated travel time.

The boundaries of the basic units and urban areas were digitised as part of preparation for the 1980 census. Aim was to make documentation easier and to be able to produce thematic maps in a simple way.

What can be learned?

Use of registers and basic units are often discussed in different international and European forums on statistics. Jan Byfuglien draws some conclusions from the Norwegian experience in developing the geography of statistical information and linking it to GIS.

The address may be a key in the spatial referencing of statistics and an address register may be a tool for linking statistics to geography. One crucial aspect is the definition of the "basic address unit" (building/entrance/apartment) as well as the standardisation of addresses. Lack of standardisation in this area has caused quite a lot of problems and extra work.

Defining basic statistical units as building blocks has proved useful in handling statistics at a low geographical level. But the solution requires good cooperation with local administrations in order to establish and maintain the system with reasonable quality. Central resources are also required to develop a harmonised solution - to follow up changes. Close cooperation - not possible in every country - with the national mapping agency has been of primary importance. "Statens Kartverk", the Norwegian mapping agency, is actually responsible for the GAB register system. Cooperation is especially important when establishing and maintaining the digital boundary files.

Use of specific GIS tools has been useful for documentation and mapping of the basic units and the urban areas. But the production of thematic maps has so far been rather limited. The problem for Statistics Norway has been to establish workable technology. Some tools may be too sophisticated for fairly simple tasks and require competence that may not be available.

As some basic units are rather small, dissemination of original data to end-users has been restricted in order to protect individual privacy and not to publish meaningless data. The solution is to disseminate only a standard aggregation of basic units.

Italian CENSUS project

How remote sensing and GIS were used for the 1991 census

by Martine Kleinberg

Istat became one of the statistical institutes to use Geographical Information Systems for statistical purposes in 1991. It was the major innovation of the 1991 censuses, together with use of remote sensing. With the 13th population and housing census, Istat produced uniform cartography of its entire national territory using satellite observation. This enabled the drawing of physical borders of built-up areas as well as of maps used by Italian municipalities to organise the demographic census. The project was named CENSUS, an acronym in Italian of Numeric Processed Cartography for Land Use Statistics.

The project was undertaken by a group of enterprises working in the fields of remote sensing, GIS, computer sciences, interpretation of data collected by satellite and cartographic data collection.

Principal steps were:

❶ Acquisition of communes' borders.
❷ Producing borders of built-up areas using remote sensing techniques.
❸ Sending communes their own cartography with borders of built-up areas and administrative boundaries.
❹ Checking communes' borders and partioning enumeration areas.
❺ Digitising enumeration areas' borders.
❻ Implementing the National Address Archive.

Most significant innovations of the CENSUS were the use of remote sensing and the digitising of enumeration areas.

Why remote sensing?

In the past the only homogeneous nationwide cartography of built-up areas was that of the Istituto Geografico Militare (IGM) on a scale of 1:25,000, rarely updated. Only certain regional administrations produced more up-to-date cartography, often to a different scale. Moreover, maps were not all updated at the same time. The several available at local level used different characteristics of geographic projection, scale and time updating.

Therefore, Istat decided to produce thematic cartography of human settlements for the census by remote sensing. There were other reasons for this decision. First, municipalities were provided with a product that only required checking rather than new processing, as in the past. This resulted in a substantial reduction of time and cost in producing maps. Second, the project was based on the computerisation of the processes so the territorial basis of the censuses could be connected to a Geographical Information System. In this way, it was possible to combine the territorial basis of the censuses with other statistical data.

Urban areas were identified through the interpretation of SPOT satellite panchromatic images. These indicated distribution of these areas in Italy at the time of the census.

Using digitised enumeration areas

The smallest territorial entity is the enumeration area (census section) - the zone of responsibility of a single enumerator. During preparation of the 1991 census, municipalities were asked to undertake two important operations, crucial for both collection and analysis of results. First, they had to identify "inhabited localities[1]"; second to divide the territory of the municipality into enumeration areas. In the past, enumeration areas were defined by the maximum number of census units an enumerator had to contact. Since 1981 they have been considered as possible targets for territorial analysis. They grew in number from 150,000 in 1981 to 320,000 in 1991. As a result the average size fell. After Istat verification, the boundaries of each census section were digitised, enabling digitised mapping to show the sub-division of all municipal areas into enumeration areas. The result was three main geometrical representations in numeric form: administrative boundaries of communes; "inhabited localities" (divided into centres, nuclei and dispersed houses); and enumeration areas.

If this product is not itself a GIS, says Istat, it certainly forms the core of a future system of relating spatial dimensions not only to statistical data but also to administrative and geographical information.

A successful operation

Istat sees all this as a positive experience overall. The results are thematic maps of the Italian territory. Their integration is the first step towards the construction of a GIS by Istat. This system should favour development of spatial data analysis.

The digitised database of the boundaries of municipalities, inhabited localities and enumeration areas will provide the initial spatial reference of the next population census. Integration of thematic maps with statistical geocoded databases will be particularly important in the near future. The system will provide thematic maps locating significant demographic, economic and social phenomena. And important progress is foreseen in the marketing of satellite systems for earth observation. Advances in the resolution of sensors may deeply influence studies of urban areas.

[1] "locality" means an area of one or more houses classified as follows: "centro abitato", an agglomeration of contiguous houses, characterised by at least one social service or shop; "nucleo abitato", an agglomeration of several contiguous houses with no social centre; "case sparse", houses so isolated that they cannot be even considered "nucleo".

Remote Sensing and Statistics

by Christophe Duhamel

Remote sensing is a set of knowledge and techniques used for determining some characteristics of objects through remote measurements without direct physical contact. In the case of Earth Observation, remote sensing is a set of knowledge and techniques concerned with collection and processing images of the earth's surface (geographic objects) from sensors mounted on aircraft or satellites.

What kind of data are provided by satellites?

In addition to traditional aerial photographs from aircraft or even satellites, several techniques to obtain radiometric using optical or radar sensors have been developed:

- optical instruments can collect radiometric characteristics of objects on the earth's surface. These radiometric characteristics vary according to the nature of the objects. This often gives the possibility to identify these objects from a distance. This "identity card" of the object is created through optical sensors measuring their spectral signatures on several spectral bands (explaining the term: multispectral). The radiometric values of the spectral bands may be visualised with colours: this transformation often allows a characterisation and a differentiation of the object through its "colour". Multispectral sensors are usually carried by satellites and are particularly adapted to the analysis of the earth's natural resources. Some well-known sensors are those embarked on the American satellites Landsat (Thematic Mapper sensors) or the French satellite SPOT (HRV sensors).

- with radar techniques, sensors send out signals towards the earth's surface and measure their echo after reflection from the obstacles. These techniques have the advantage of including cloud-covered areas. Well-known sensors are embarked on ERS satellites of the European Space Agency.

In the background, Mr Macedo, Director of Agricultural Statistics, INE. In the centre, Mr Duhamel (CESD- Communautaire) and Mr Croi (CESD-Communautaire)

What are the characteristics of these data?

The technical characteristics of the different sensors which are of interest for satellite image users are their spectral, spatial and temporal resolutions.

- The spectral resolution is the capacity to distinguish between different wavelengths emitted or reflected by an object on the earth's surface. The existing sensors cover different spectral bands, more or less well fitted to the applications.

- The spatial resolution is the capacity to distinguish between distinct elements on the earth's surface. This spatial resolution is characterised by the size of the basic element of the image - or pixel- which varies for the different sensors (for example 30*30 meters for Landsat TM and 20*20 meters for SPOT XS in multi-spectral mode)

- The temporal resolution is the capacity to deliver information regularly in time (every 16 days for Landsat, between 2 and 26 days for SPOT according to the programming of the satellite)

The "objects" on the earth's surface

The objects on the Earth's surface can be characterised in terms of their spatial, semantic nature and temporal dimension:

- The spatial dimension is expressed in terms of size, shape, positioning or spatial organisation.

- The semantic or classification dimension is linked to the nature of the object. Objects on the earth's surface may be described in terms of: land cover (physical aspect directly recognised on the ground: vegetal, mineral, aquatic, artificialised) or land use (concept linked with the economical and human activity: agricultural, housing, industry, recreation...). This latter is not necessarily visible on the ground and requires some abstraction at the level of interpretation.

- The temporal dimension is linked to the kinetics of the object. It is linked to spatial and nature changes (the idea of land cover/land use change).

What satellite remote sensing "sees"

The possibilities of discrimination and identification of "objects" within satellite images are directly linked to the characteristics of the tool in terms of spectral, spatial and temporal resolution. Remote sensing only "sees" land cover. A satellite image neither gives the possibility to determine directly the use of a building nor to detect objects whose size is smaller that the pixel size. Transforming a satellite image into a land cover map involves pre-processing: geometric pre-processing (the objective is to georeference images onto a geographic reference system) and radiometric enhancements (enhancing the "interpretability" of the image). Image analysis aiming at creating land cover maps can be achieved following different ways: relatively automated image processing (for example multispectral analysis based on pixel analysis) or using human photo-interpreters.

In order to meet the requirements of a majority of users, land use maps have to be produced from land cover maps. Several inference methods can be applied: analysis of the succession of phenological phases "bare soil - vegetal" for discriminating arable land ; contextual analyses taking account of spatial organisation and density of built-up areas for delimiting housing areas. These methods can be applied in different ways: photo-interpretation (an expert interpreting, as far as possible, the use or the socio-economic role); classification procedures based not only on spectral analysis pixel by pixel but also using contextual, textural and spatial organisation features; finally multi-temporal analysis.

However these methods do not completely cover the needs and require the use of ancillary information: ground surveys, administrative sources, printed maps and other digital geographic databases. Because of this, Geographic Information Systems are indispensable for bringing together all these sources of data.

What is the interest of the statistician in these techniques?

Statisticians have to meet an increasing demand for statistics for analysis at different geographic levels. Paradoxically, this has to be done while limiting the response burden on those who provide these statistics. The spatial and geographic dimension of statistics and the importance of regional and spatial aspects for the management of national and European policies (regional policies, agriculture, environment) have consequences on the work of statisticians. They need to cope with questions linked to geographic information. This has consequences not only in terms of collection, processing, analysis and diffusion of information but also in terms of organisational and institutional aspects.

Among the different ways to tackle this problem, the increasing use of advanced technology such as Geographic Information Systems has been noticed and some National statistical Services already use such techniques into the statistical production process.

(cont. on page 32)

Mapping urban areas by remote sensing

by Fausto Cardoso

As part of the remote sensing and statistics project, a pilot study has been set up aimed at testing the feasibility, using satellite images of urban areas, of producing large-scale maps (1:25 000) of land occupancy and use and defining the morphological boundaries of urban areas.

Because such studies are so time-consuming, they are multi-purpose. The idea is to offer information to a range of potential users - not only statisticians but also local decision-makers, town and other planners, geographers, and so on.

This pilot has been running since 1993, involving special studies on a number of urban areas in Europe: Ashford, Limbourg-Sud, Main-Taunus, Bordeaux, Toulouse, Lisbon and Seville. The project uses private contractors, overseen by Eurostat and the appropriate national statistical institute, who work to common specifications. Similar studies have been carried out in France under the Ministry of the Environment. Usually, each study comprises three phases. The first consists of producing a land occupancy/use map using satellite images. This uses a common nomenclature to distinguish clearly the component parts of urban areas and provide as much information as possible from satellite images, usually supplemented by other data.

This is the key phase of each study - on the results depends the quality of the final product. All "urban sites" in the nomenclature, identified in each map, make up the morphological urban area (roughly comprising all simulated areas less than 200 metres from each other).

The third and final phase uses GIS techniques to relate the cartographic information representing the territories of administrative units selected (usually NUTS-5) to the morphological urban area. This cross-referencing provides the administrative composition of the urban areas, the level used in their management and the level for which the statistical information is usually collected.

This pilot project is an example of the possibilities at European level for the development of operational techniques and new tools for analysing urban environments. Results now available show remote sensing as a technique suited to the collection of information needed for certain types of area planning, and the management of certain aspects of the environment that require systematic collection of certain statistical information, especially on specific areas.

Remote sensing has already been used to compile maps for the most recent population census. The same techniques are now being tested for updating this information and making it easier to define census districts. This will make large-scale integration of statistical data possible - with census information down to district level - using GIS and territorial referencing. This will provide data users with information that enables very detailed territorial analyses.

The pilot project has also paved the way for other operational initiatives designed to meet the needs, in terms of harmonised information on urban areas, of a whole range of operators. These include local administrators, planners, technical experts and those responsible for making decisions on territorial planning or on studies and decisions affecting the environment. It is along these lines that Eurostat plans to direct its efforts in the near future.

Information on this project and other ventures in this field is available on the Internet (http://ewse/ceo.org and http://www.city.cict.fr:8001/).

Concerning the use of Earth Observation data, the situation is different. Very few National Statistical services have integrated this kind of data in a regular process of data collection, for the following reasons:

- existing traditional statistical systems are well developed (for example agriculture statistics),
- the need to preserve continuity in terms of methodologies and current statistical series,
- fear of technology-driven approaches,
- knowledge of potential applications of remote sensing for statistics is still not spread widely enough.

However, there have been some considerable efforts undertaken for some years at European or national level on the use of remote sensing for statistical applications.

Statistical applications

The most significant applications have been undertaken for agriculture statistics stimulated by the European programme MARS (Monitoring Agriculture by Remote Sensing). Several National Statistical services have also been involved in remote sensing applications: the Italian Statistical Office, for instance, has been a pioneer in this area. One of the most significant issues of the remote sensing applications in agriculture statistics is the necessity to produce figures at a European or national level. Large areas need to be covered. This implies either the use of sampling techniques (the best known is one of the components of the MARS programme using area frame sampling surveys) or the use of low spatial resolution satellite data.

Mr Heath (Eurostat), Director of Directorate F - Agricultural, fisheries and environmental statistics

This kind of approach is quite different from cartographic approaches where Earth Observation data are used exhaustively on smaller areas: for instance for a region or an urban agglomeration. The "Remote Sensing and Statistics" programme developed by Eurostat since 1992 has focused activities on the development of applications taking into account both spatial and statistical dimension of information. The applications developed on urban areas show that it is possible to meet requirements in terms of land monitoring and planning as well

as statistical needs (land use statistics, delimitation of agglomerations) by using the following technical phases:

- producing land use maps combining Earth Observation data and ancillary data using a GIS. This work has been based on a harmonised statistical framework.

- exploiting these results for applications (delimitation of agglomerations, environmental impact studies, preparation of cartographic documents for census population).

This kind of multi purpose procedure applied to relatively small areas provides the opportunity to develop cost-efficient applications.

Statistical and/or cartographic approaches

Statisticians have the possibility to make use of various approaches for introducing Earth Observation data into statistical information systems:

- a purely statistical approach based on sampling techniques. In this case the images used relate to a set of elements of the Earth surface considered as representative samples of the whole area to be covered. A well-known application is the one in the MARS programme called Early area estimates at the European level.

- an intermediate approach where remote sensing images are used on large areas for delimiting strata (e.g. regional inventories for agriculture statistics) or on smaller areas (e.g. stratification of towns for developing surveys on the informal sector in African towns)

- an approach which is both statistical and cartographic where Earth Observation data are used exhaustively on the study area and contribute to the development of multi-purpose information systems.

Advantages and limitations

Remote sensing - as a statistical source of information - is of interest for the following reasons:

- its objectivity: a measurement instrument used uniformly and independent of a local observer on the spot.

- its availability: rapid supply of information for wide areas and possibilities of repetitive supply for multi-temporal analysis and updating procedures.

- its geographic nature: geographically referenced information ready to incorporate within a GIS, independently of administrative limits and frontiers.

- its digital nature: allowing extraction of information from archives and setting-up of series.

Its limits are also known:

- acquisition problems for optical sensors in cloudy regions (a real problem in Northern European countries)

- a spatial resolution which is not sufficient for some applications (in urban areas for instance)

- huge amount of information to process (leading to problems on standard GIS)

- copyright, protection and diffusion of data problems.

Perspectives

Statisticians have to continue to think about the general problems linked to the introduction of geographic information within statistical information systems. They have also to get used to working with other scientific communities such as geographers and cartographers, and with other information users. They have to tackle the problems of organising the auxiliary data exchange problems of diffusion, copyright and statistical secret. But they must be better informed about existing experiences in this area and need to have the opportunity to exchange their knowledge and doubts. Awareness-raising of statisticians about these new techniques implies : organisation of discussion fora ; diffusion of methods and results through appropriate media; participation of statisticians in demonstration projects or pre-operational projects on remote sensing applications for statistical purposes. The Eurostat "Remote Sensing and Statistics" programme has fulfilled this role so far and will continue to do so in future.

For further information:

- *Rainer Muthmann, Eurostat, F2*
Agricultural products and fisheries
tel: (352) 4301 37260
fax: (352) 4301 37318

- *Christophe Duhamel*
Land Use Programme
CESD-Communautaire
2-6 Route de Trèves
EBBC B/4
L-2633 Senningerberg
tel: (352) 34 95 11 261
fax: (352) 34 62 09

Geo-marketing: the economic challenges

by Bernard Coutrot

Geo-marketing is a topical subject. Not a week goes by without an article in some trade journal or the general press. Bernard Coutrot is the Chairman of Simaris SA, a company specialising in statistics and modelling for the management of territorial policies. Here he gives an idea of what geo-marketing now means and its implications for business strategy.

"Geo-marketing: what's that?"

Marketing departments are becoming more like military command posts, with marketing managers the "generals" poring over maps as they conduct their campaigns. While everyone is talking about geo-marketing and many are applying the idea, few have a clear idea of what it is all about.

When the term "geo-marketing" arises, people usually think of maps, local data and mailing lists. Geo-marketing is regarded as a kind of toolbox, with maps taking pride of place.

A second view, geared more to marketing, is on patterns of consumption or saving in which location is the prime factor. The underlying idea is: "Tell me where you live, and I'll tell you what you are."

Both views are equally unsatisfactory. The former is too technical, limited to describing the means rather than the aims. Nevertheless it is true that scientific use of maps adds a novel and substantial element to marketing, based primarily on detailing geographical locations in relation to each other. The latter view is also limited and incomplete. Limited because it claims to replace traditional breakdowns by age, sex or socio-professional group by the sole criterion of stratification by location. And incomplete because it ignores the decisive effect of local supply and mobility. As territories under investigation get smaller, such factors are more and more relevant in explaining patterns of consumption. They need to be incorporated into any "local" approach.

A third way involves looking at the use of geo-marketing. It quickly becomes apparent that it covers the distribution of general products and services. This is not specific to any particular sector of activity, but can occur in any firm or public service department dealing with a greatly fragmented market. It can be found in banking and insurance just as often as in distributive trades, or in the transport industry just as frequently as in non-market services or the media.

As an aid to managing distribution networks, geo-marketing satisfies three main areas of concern:

❶ strategy for territorial coverage and development
❷ sales management and promotion
❸ operational marketing, business organisation and targeting.

Simaris SA offers consultancy and study services in three main areas:

❶ distribution networks and geo-marketing: setting-up and management of distribution networks for consumer goods

❷ geographical impact studies: economic evaluation of territorial and local development policies (such as for town and country planning and urban management); development of transport and communication networks

❸ diagnostic analysis of towns and enterprise locations.

Fierce competition in France

Two features tend to typify the consumer market in France:

- a very general range of products, whether in the financial sector or consumer goods (ultimately there is not a great deal of difference between products)
- almost total geographical coverage.

Inevitably this results in fierce competition.

There is also a strong tendency towards specialisation and demarcation of production and distribu-

Bernard Coutrot, Director-General of Simaris SA

tion. In consumer goods, the two jobs split a long time ago. In the banking, insurance and motor vehicle sectors, the networks merge with manufacturing. In future, however, they could well be separated to some extent from the manufacturing organisation.

This demarcation of functions tends to lead to a power struggle between manufacturers and suppliers in client/supplier relations aimed at securing strategic advantages. The balances established are always fragile and shaky; no position gained is ever secure. After controlling distribution, manufacturers are now at its mercy.

Marketing: hitting the local target

Against this background, securing a competitive edge is what geo-marketing is all about. Where there is a lot of competition among products all broadly similar, strategies with a national approach to targeting customers become less and less effective.

Local campaigns are virtually the only way of beating market competitors and geo-marketing is the way of fine-tuning supply to demand. It has three major benefits:

Cutting distribution costs

Carefully adapting supply to the needs of local consumers makes it possible to optimise distribution costs.

Fostering customer loyalty

This means offering customers extra services tailored to their expectations. In the case of major consumer products, these "extras" are supplied as services at the moment of sale eg customer relations and local services.

Improving network efficiency

Geo-marketing makes it possible to record productivity in a variety of fields by prompting better awareness and response in the network. Modern distribution has done away with one of the main benefits of the job of retailer - providing the customer-manufacturer link that reflects market needs. In modern large-scale distribution, geo-marketing offers the chance for this role as go-between to re-emerge - it can be effective in adapting supply to local demand and ideal for fostering new sales campaigns. Geo-marketing defines the modern, effective and successful banker or trader.

There is another particular factor that affects primarily the distribution sector: the organisation of relations between manufacturers and distributors. This includes large data files recording patterns of consumption; emergence of manufacturers' newspapers and magazines; and possibilities for geographical selection and targeting, which allows manufacturers to venture into direct sales - to move into local areas and develop a kind of control of distribution. For example, a manufacturer's publication targeting a specific area to encourage people to go to certain shops to buy that manufacturer's products, could in future make or break sales outlets.

To sum up, geo-marketing is not some fad or fashion but will change the future shape of the profession. Skill in its use will be a key factor determining the success and progress of firms in all consumer markets.

Teaching statistical geography and geo-marketing

Bernard Coutrot is also Associate Professor at the University of South Brittany (France). He is responsible for a new training course, available to students from the start of the 1996 academic year. The Institut Universitaire de Vannes in Brittany is expecting the market in the use of cartography and geography to expand dramatically, and has decided to include among its courses an introduction to statistical geography geared to use in the social science field. This will be directed at young statisticians studying geo-marketing and computer science students destined to be local geographical information systems experts for firms in the future.

Further information: IUT de Vannes, tel (+33) 97 46 31 33.

INTRASTAT II: Intrastat was implemented to provide high-quality and reliable up-to-date statistics on intra-Community trade in goods after the introduction of the internal market and the abolition of customs formalities at the borders between the Member States of the Union. Instead of being derived from customs declarations, trade figures are now compiled from data provided directly by companies.

Intrastat- the way ahead

by Jean Drappier

A seminar in Luxembourg at the beginning of March provided a forum for representatives of all parties involved in Intrastat: government departments, business federations, users and suppliers of information, research institutes, SMEs etc.

Plumbing the depths

Three years after the Intrastat system was set up, Eurostat and national governments have made an overall assessment. A sample survey was conducted to measure the burden on parties responsible for providing the information, compare that burden with user requirements, find out how well the various operators thought the system was functioning, and help in the search for future solutions. A total of 4,700 information providers and 1,959 users were questioned in the 12 countries which were EU members in 1993, when Intrastat was launched. Certain conclusions were reached, in particular on:

- the internal costs of Intrastat: most of the information providers (37% as against 20% who take the opposite view) now tend to think that the system has reduced their costs

- certain specific difficulties: one information-provider in three is still having problems, mainly with the flow of arrivals (search for the nomenclature code, measurement of statistical value and of net mass). Apart from the data themselves, the greatest problems for information-providers - one enterprise in four in the Twelve, almost one in two in Ireland, and at least one in three in Belgium, Germany and Luxembourg - occur with deadlines for declarations

- data quality: intrinsically, quality, especially that of total value of dispatches and arrivals and detailed results per country, is estimated to be good. But roughly one person in three is not satisfied with these three aspects. Finally, although many users do not feel able to express a view on this subject, opinions are divided on the level of detail of results per nomenclature: 38% are satisfied with the combined nomenclature, for example, and 27% not. But greatest dissatisfaction is clearly with deadlines for making data available, whether at global (42% dissatisfied) or detailed level (53% dissatisfied).

Overall, this assessment was fairly positive about the quality and accuracy of the data themselves.

Assessment of national systems

In an attempt to cover fully the wide variety of collection systems reflecting the differences in national environments (size of surveys, resources, administrative infrastructure, traditions and mentalities of different governments), assessment teams of experts from Member States and Eurostat interviewed officials of the statistical institutes of all the countries involved. Interviews were based on a detailed questionnaire and concentrated on:

- methodology: definitions were generally accepted by all Member States, although there were difficulties with leasing operations and indirect imports and exports or "specific movements" (ships and aircraft, military goods, spare parts for motor vehicles etc)

- data transmission and processing: systems closely linked to the VAT system have proved particularly efficient on the speed data are sent in by the parties responsible and the low non-response rate. Eurostat's EDICOM project was encouraging greater use of informatics

- monitoring procedures

- the register of intra-Community operators: one-third of Member States were not able to state how many enterprises were liable to account for taxation and to provide Intrastat information in view of their intra-Community turnover for 1994

- the system of statistical thresholds: in some Member States the value of intra-Community trade

was underestimated by less than 0.5% as a result of the application of statistical thresholds, but in others the figure was almost 3.5%

- adjustments.

Following this assessment, Eurostat set up three working parties to undertake specific tasks:

- harmonise methods and legal provisions
- improve processing and monitoring procedures
- improve adjustment procedures.

Enterprises and business federations

The seminar was used by a number of federations as an opportunity to speak out. While some stressed the proportionally greater burden on SMEs, this view was not unanimous. Streamlining of SME procedures must be planned with particular regard to the requirements of statistical information on the trade of these enterprises. There was a need to provide feedback to SMEs.

Other federations (especially UNICE and EUROFER) advocated maintaining, for the two flows, detailed monthly results rapidly available, together with results related to extra-Community statistics — without, however, standing in the way of simplification. The need was also voiced for supplementary information, such as country of origin of goods.

Future prospects

Adapting or revising the current system depends on several factors:

- future statistical requirements with Economic and Monetary Union on the horizon

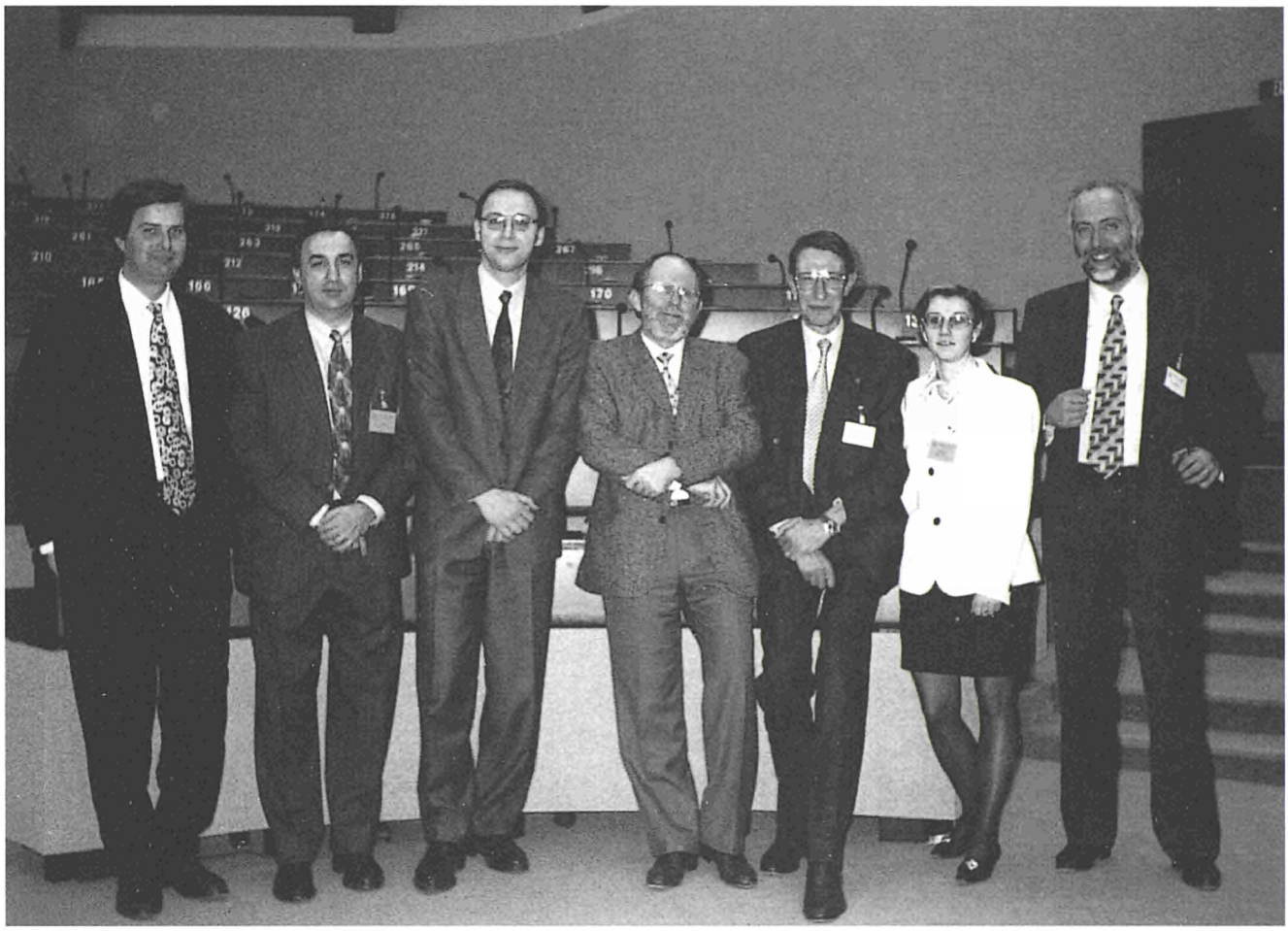
From left-to-right: Alain Chantraine (Director of Directorate C, Eurostat), Yves Franchet (Director-General of Eurostat) and Gilles Rambaud-Chanoz (Head of Eurostat's C4 unit) at the opening session

- link with the fiscal system: thorough revision of Intrastat could prove necessary, but the timetable for conversion to the definitive system is unclear
- optimisation of the current system: examination of national systems revealed feasible measures to remedy a number of hitches. Furthermore, continued computer development should ease the burden on information-providers and improve information quality
- future development of Intrastat: adaptations such as the extension to cover services or incorporation of business statistics were not feasible in the short term. These came under the broader heading of a thorough revision of statistical concepts, to be studied especially in the light of continually changing market circumstances.

Practical suggestions

A number of practical suggestions for simplifying Intrastat were made:

- Reduction in variables covered (mode of transport, choice of invoiced amount, net mass, transmission deadlines etc)
- Simplification of the nomenclature. This was the most urgently requested of all simplification measures. The proposal for limiting data collection to a single flow met with a very mixed reception. There should be a thorough study of the implications.

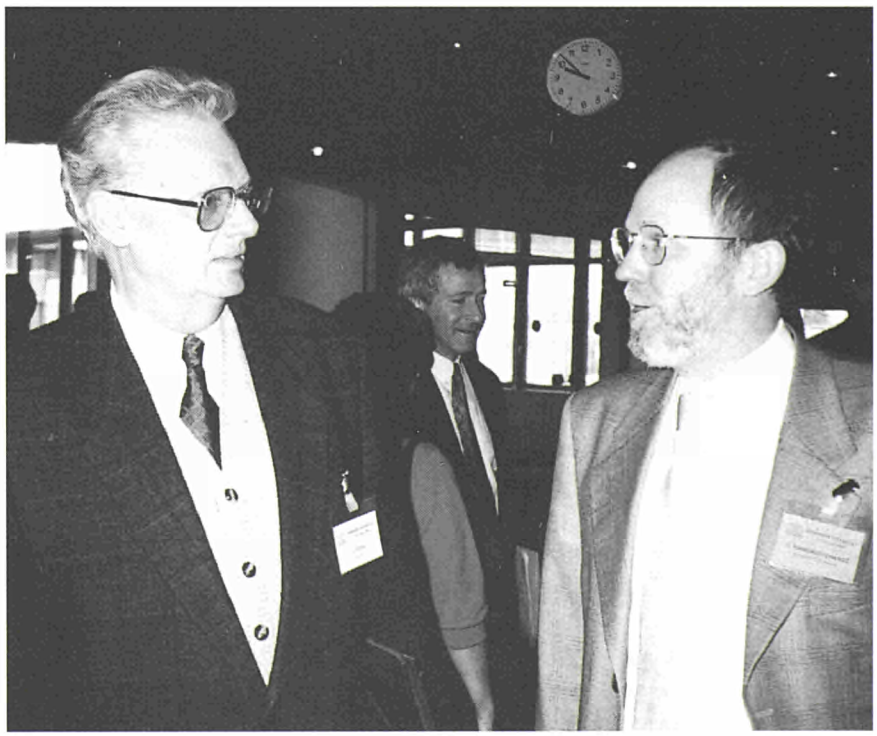


The team that organised the seminar: (from left-to-right) P Wolff, J Sousa, J Heimann, G Rambaud-Chanoz, A Chantraine, R Rugani and PL Iapadre

The seminar generally revealed a broad consensus on the usefulness of Intrastat statistics and the inadvisability, in the short term, of major changes. The cost-benefit analysis is considered unfavourable by some, and it is necessary to look at adjustments and simplifications likely to ease the burden on all enterprises, and not only SMEs, and also to improve operation of the system as a whole.

Everyone stressed that the continued "telematics" modernisation of collection, processing and dissemination systems should be a priority.

While emphasising budgetary and political constraints, Eurostat proposed some possible short and medium-term options, together with a timetable.



Mr Jacques Dispa (left, in conversation with Mr Rambaud-Chanoz), who retired at the beginning of 1993, was Head of the Eurostat unit Methodology and Classifications of International and Intra-Community Trade and was responsible for the design and implementation of the new collection system

Marie-France Rivet

The work was spread over four sessions and two days.

Theme 1:
"Analysis of current situation"
In the chair: Mrs Marie-France Rivet, Assistant Director of the Direction Générale des Douanes et des Droits Indirects (DGDDI), France.
Speakers: Messrs Pascal Wolff and Jürgen Heimann, Eurostat; Mr Francesco Lattarulo, Italian National Statistical Institute (ISTAT); Mr John Kidgell, Central Statistical Office, UK; Mr Laurent Westermeyr, European Union of Craft, Small and Medium-Sized Enterprises (UEAPME); and Mr Jean-Claude Fontaine, EURATEX.

Theme 2:
"Information needs for administrations and research institutes".
In the chair: Professor Paolo Guerrieri, Professor of Economics at La Sapienza University, Rome, and the College of Europe, Warsaw.
Speakers: Mr Heinrich Lützel, German Statistical Office; Mr Marco Committeri, Bank of Italy; Mr Mouhamadou Dramé, Centre d'Etudes Prospectives et d'Informations Internationales (CEPII), France; and Mr Jean-Claude Roman, Eurostat.

Jean-Claude Roman (left) and Marco Committeri (right)

Anna Lunden

Theme 3
"Information needs for enterprises"
In the chair: Professor Joop G Vianen, Small Business Research and Consultancy (EIM), Zoetemeer, Netherlands
Speakers: Mrs Anna Lunden, the Finnish Entrepreneurs; Finland - Mr Ray Battersby, Simplification of International Trade Procedures Board (SITPRO), UK; Mr Ian McLean, Business and Trade Statistics Ltd, UK; and Mr Guy Schuller, Luxembourg Institute for Statistics and Economic Studies (STATEC).

Theme 4
"Different possible scenarios"
In the chair: Professor Peter Von der Lippe, University of Essen, Germany
Speakers: Mr Michel Aujean, European Commission, DG XXI; Mrs M-P Benassi, Eurostat; and Mr Gilles Rambaud-Chanoz, Head of External and Intra-Community Trade Unit, Eurostat.

Michel Aujean

Successfully engaged, the partners move towards...

An east/west statistical wedding

by John Wright

The marriage of the statistical systems of Central and Eastern Europe and the European Union continues to gather pace. This is an important requirement of Central and Eastern European Countries' (CEEC) bid to join the EU.

Further momentum came from the third meeting of the Steering Committee on Statistical Cooperation with Countries of Central and Eastern Europe held by Eurostat in Luxembourg in mid-April.

Twelve CEECs were represented, mostly by their Presidents or Director-Generals. Ten Member States were there, too, as were delegates from OECD, the World Bank, EFTA, the UN Economic Commission for Europe, Norway and Switzerland, as well as from different parts of the European Commission - all serving to underline the importance of this meeting

A key aspect was the presentation of a general framework document for Eurostat/CEEC statistical cooperation. **Mr Alain Chantraine**, the Eurostat Director responsible for relations with these countries, described the document as "a Michelin Guide, an aide-memoire, designed to structure dialogue between the partners involved, and to be updated as we go along".

The document identifies the following criteria for this cooperation:

- *the Commission's requirements*
- *cooperation components: technical assistance and training, pilot surveys, data collection and dissemination, sectoral evaluations and preparatory work for accession*
- *activities of the Phare/Statistics Multi-country Programme Coordinating Unit (PCU) now established in Vilnius, Lithuania*
- *human resource requirements and reinforcement of Eurostat by CEEC experts*
- *financial resources: Phare and Eurostat budgets.*

Pre-accession strategy

Statistical cooperation, states the document, must take into account the Commission's requirements for statistical information on the CEECs, particularly following confirmation of the pre-accession strategy at the 1995 Madrid Summit. This implies that the "data collection/dissemination" and "integration" aspects will become increasingly important in statistical cooperation with CEECs.

Up to 1994, it goes on, statistical cooperation with CEECs essentially took the form of technical assistance.

Starting last year, a pilot surveys component was added with the aim of contributing to harmonised data collection and dissemination in line with EU methodology in certain sensitive areas affected by transition. These surveys are coordinated by the relevant Eurostat sectoral units using the same mechanisms and instruments as those for the European statistical system.

From this year onwards the data collection and dissemination component is being reinforced through three complementary avenues:

- support for expanding the geographic and subject matter coverage of joint publications already existing at CEEC sub-regional level
- launching of direct data collection by "pilot units" of Eurostat
- the valorisation and integration of data held by international organisations.

The document goes on to say that as from this year sectoral evaluations are being organised to examine in depth the state of the statistical systems of all CEECs - availability, quality and regularity of data - in the priority areas affected by transition. These evaluations will enable technical assistance and

training to be targeted better and optimised, and also provide guidance for the approach to data collection and dissemination.

From this year onwards Eurostat units responsible for sectors with priority in the context of accession will commence preparatory work for accession by proposing regional or sub-regional initiatives - working parties, sectoral seminars etc - with a view gradually to integrating the CEECs into the European statistical system.

This, adds the document, implies that, as CEECs move towards integration, led by Eurostat's sectoral units, the "traditional" technical assistance and training programmes will undergo an important change:

- They will increasingly involve the participation of the CEECs in working party meetings and seminars organised by Eurostat as well as in Training of European Statisticians courses.

- They will become more and more regional - compared with their chiefly national nature at present.

'We must grid our loins'

Putting flesh on the bones of the report, **Mr Chantraine** told delegates: "To technical assistance, which has been taking place since 1991, has been added the major component of pilot exercises - this requirement of the Commission in terms of data collection. These pilot schemes - the transmission of data to Eurostat - are fundamental to the central development and preparation of the pre-accession phase.

"Then there is the whole question of sectoral evaluations - assessments that will give us a good idea of the state of development of statistical services in your country in this pre-accession phase. The Commission has to form an opinion about each country before accession negotiations can actually get under way.

Delegates to the Steering Committee meeting

"The process should not be fundamentally very different from that which EFTA countries went through before they became members of the EU. However, the starting point for the majority of EFTA countries was considerably more favourable in that they had a market-oriented statistical service. You", he told the CEEC delegates, "will have to go through a much more profound reform before your data come on line."

Mr Chantraine went on: "Technical assistance will continue to play a fundamental role although the move increasingly will be towards statistical cooperation. Some countries in the Community still get support from the EU for the development of their statistical systems - Greece and Portugal, for example - and this will continue to be the case, as it will in CEEC countries when they join the EU.

"That's the policy: strengthening the weakest links in the chain. Some CEECs will become members of the EU in five to ten years time. We have to gird our loins, as it were, to get a statistical system in place which is as efficient as that in the EU. To do this, greater emphasis will be placed on transmission of data according to standards laid down and systems prevailing in the EU.

"If we don't play our role fully", **Mr Chantraine** urged delegates, "others will jump into the breach and the job won't be done as well as we would have done it. We shall obtain the necessary resources only if we demonstrate that the statistical system we are setting up in these countries will provide the information to serve the purpose. No politician will continue to fund the construction of complicated nonemclatures and methodologies for years and years if they don't see figures coming back to their desks - we have to show our political masters some results."

During the meeting of the Steering Committee on Statistical Cooperation with CEECs, John Wright took the opportunity to speak to the top people of the statistical offices in three of the transition countries - to discuss the challenges they face and how they regard the prospect of a statistical (and political) marriage with the European Union...

Statistics in Slovakia

No longer an 'unthinking machine'

Mr Stefan Condik

Changing the way people in Slovakia regard official statistics is high on the list of Stefan Condik's priorities. This was his third Steering Committee meeting since being appointed President of the Statistical Office of the Slovak Republic in 1994. I asked him about the value of such meetings...

"The Phare programme and the help of Eurostat are a big chance for us to receive know-how from EU countries and also discuss problems in an informal way", he said. "It is giving us something that, if we were on our own, to achieve the same results would take three times longer. We are also able to comment on Eurostat's strategy on Central and Eastern European countries and from time to time to try to improve some steps which are not quite suitable for us."

What were the main ways Eurostat could help?

"First there was technical assistance training and exchange of experts. Initially it was a one-way exchange but after three or four years there was a new Eurostat strategy to concentrate on projects and exchange of data. This is a big, big challenge for us: to know that we are approaching our target of our statistics being comparable with the EU."

So soon they would start to transmit data to Eurostat?

"Yes. There was a meeting recently on establishing a common data base. We shall concentrate on macro-economic data, especially that derived from national accounts, foreign trade, labour statistics etc.

"The first target is to prepare with Eurostat a standard publication on basic macro-economic statistics of Central and Eastern European countries; and then move towards creating more and more standard definitions of data and electronic transmission. The aim is to create a standard data base for the European Union - a basic condition of our accession."

When will Slovakia join the EU?

When, I asked, did he see the Slovak Republic joining the EU?

"I hope not very long but this is a question for politicians not statisticians. I think we shall be not the first one but I believe not the last one. My personal estimation is that it will be 2005."

Were people in Slovakia looking forward to this?

"My office is regularly engaged in public opinion research and one of our standard questions is on what people are thinking about integration with OECD or the EU. Perhaps two-thirds of our people are in favour."

Of course, I underlined, Slovakia is one of the more economically advanced of CEEC countries.

"I hope", replied **Mr Condik**. "I think we are currently running at fourth place in terms of GDP per head behind Slovenia, the Czech Republic and Hungary."

So many challenges ahead for the Slovak Statistical Office. How many staff to meet them?

"At headquarters in Bratislavia 360; in the regions about 780. Now we are restructuring because Slovakia itself is changing its regional structure. We are responsible for all statistics and for dealing at the first level with international organisations. We have the Statistical Programme which is adopted every year and which defines the scope of our work."

What, I asked, were the biggest challenges faced by his office at present?

"There is a long list of such problems. Maybe the first one is to change offi-

cial thinking in Slovakia about statistics, because in the past statistics were supplementary to the State Planning Commission's information, and many people still think that official statistics must cover practically all problems. So this is the first challenge: to move to a position of a standard statistical office in a normal market-oriented economy.

"Second problem is maybe to change the thinking of people working in the statistical office: to persuade them we are not only an unthinking machine; that we must consider what it means to work like statisticians - to question the meaning of the results we are receiving. As a result of visiting partner organisations abroad, staff are getting a good example of what it means to be a statistician outside."

V januári mala SR 1,5 milióna hostí

Bratislava (TA SR)

Podľa údajov Štatistického úradu SR cez jednotlivé úseky štátnych hraníc pricestovalo v januári na Slovensko 1,5 milióna osôb. V porovnaní s rovnakým obdobím lanského roka prešlo cez hraničné priechody a letiská SR o 87 200 viac zahraničných návštevníkov, čo je o 6,1 percenta. Najvyšší prírastok návštevníkov zaznamenali na hraničných priechodoch s Českou republikou - 67,2 percenta, cez letiská ich prišlo do SR o 46,5 percenta viac. Najciteľnejší pokles počtu hostí bol na hraniciach s Maďarskom - o 31,8 percenta. Cez hraničné priechody a letiská SR vycestoval v januári jeden milión občanov SR. V porovnaní s minuloročným januárom ich bolo o 222 400 viac - t. j. o 27,5 percenta. Počet vycestovaných osôb bol vyšší na všetkých hraničných priechodoch s výnimkou s Maďarskom, kde sa znížil o 6,6 percenta. Najviac vzrástol počet osôb, ktoré vycestovali cez hraničné priechody s Rakúskom - o 44,3 percenta, najmenej ich prekročilo ukrajinské hranice. Cez letiská SR odišlo do cudziny o 30,4 percenta ľudí viac.

PRAVDA:

Cestovné horúčky v januári

Bratislava (TASR) – Podľa údajov Štatistického úradu SR cez jednotlivé úseky štátnych hraníc pricestovalo v januári na Slovensko 1,5 milióna osôb. V porovnaní s rovnakým obdobím minulého roka ich prišlo o 87 200 viac. Najvyšší prírastok zaznamenali na hraničných priechodoch s ČR. Najciteľnejší pokles hostí mali naopak na hraniciach s Maďarskom. V januári 1996 vycestovala milión občanov SR, t. j. o 222 400 viac ako v januári 1995. Počet vycestovaných osôb bol vyšší na všetkých hraničných priechodoch s výnimkou s Maďarskom. Najviac vzrástol cez hraničné priechody s Rakúskom.

NÁRODNÁ OBRODA:

ŠTATISTIKA / Turistický ruch

V januári pricestovalo do SR 1,5 milióna osôb

Podľa údajov Štatistického úradu SR (ŠÚ SR) cez jednotlivé úseky štátnych hraníc pricestovalo v januári na Slovensko 1,5 milióna osôb. V porovnaní s rovnakým obdobím lanského roka prešlo cez hraničné priechody a letiská SR o 87 200, teda o 6,1 percenta viac zahraničných návštevníkov. Najvyšší prírastok návštevníkov bol z Česka - 67,2 percenta. Najciteľnejší pokles hostí mali naopak na hraniciach s Maďarskom - o 31,8 percenta. Cez hraničné priechody a letiská SR vycestoval v januári jeden milión občanov SR. V porovnaní s minuloročným januárom ich bolo o 222 400 viac - t.j. o 27,5 percenta. Najviac vzrástol počet osôb, ktoré vycestovali cez hraničné priechody s Rakúskom - o 44,3 percenta, najmenej ich prekročilo ukrajinské hranice.

TASR, Bratislava

REPUBLIKA:

V januári na Slovensko pricestovalo 1,5 milióna osôb

BRATISLAVA - Podľa včerajších údajov Štatistického úradu SR cez jednotlivé úseky štátnych hraníc pricestovalo v januári na Slovensko 1,5 milióna osôb. V porovnaní s rovnakým obdobím minulého roku prešlo cez hraničné priechody a letiská SR o 87 200 viac zahraničných návštevníkov, čo je o 6,1 percenta. Najvyšší prírastok návštevníkov zaznamenali na hraničných priechodoch s Českou republikou - 67,2 percenta, cez letiská ich prišlo do SR o 46,5 percenta viac. Najciteľnejší pokles hostí mali naopak na hraniciach s Maďarskom - o 31,8 percenta.

How the press report official statistics in Slovakia

'We supply data good or bad'

What, I wanted to know next, was the Statistical Office's relationship with the political process - were they independent?

"This is very relative! What does it mean to be independent? I have continued to work under successive governments and my first explanation is that I am statistician and am not a member of any political party. I am managing my office so we are not serving the aims of political parties. We must supply information whether it is good or bad."

Could politicians influence the statistics - stop something being put out?

Mr Condik: "I am not saying they are not thinking about it. But I must underline there has been no pressure during my two years in office to stop anything. I operate under a gentleman's agreement. There are data which can be published without any interest by politicians and there are data which are very interesting for political decisions. The gentleman's agreement is that we publish on the same day for government and the mass media.

"In these cases I can say we are independent from the government - and we must be. It is very important, because we must not be a party to government in changing anything. We are not commenting on the status of economy, we are supplying information - and our government respects this: that such information must be analysed by experts outside the statistical office. I think we follow the standard situation in your countries."

Dissemination 'in every reasonable form'

In what way do they publish statistics?

"Very much on standard lines. In January we regularly publish the list of publications. The first form of publication is a written one. The second form - established two years ago - is electronic. We are trying to link our internal system to the Internet now. Then maybe three or four times a year we have a press conference very close to our state-of-the-economy report. We are regularly quoted in the newspapers. We are trying to disseminate our information in every reasonable form."

Most interesting statistics about Slovakia at present?

"Maybe four or five indicators. Not in any order, the first is inflation - at present an annual 6.1%, a decreasing trend; the formal aim of our government is about 6.5%. Second is GDP, published quarterly. Third is foreign trade, and next is unemployment: we are using labour force surveys to obtain information on unemployment independent from that of the Ministry of Social Affairs, which followed different methodology.

"Unemployment is still not very good - around 13%. This has a history. After the 'velvet revolution' a lot of industry associated with army production was closed down. In former Czechoslovakia, 80% of army production was located in Slovakia: 85,000 people were affected when this was halted. Now there's a big effort to revive it, not with weapons but by reorientation to different productions programmes, but there are still problems."

Such a rate, I pointed out, was not bad compared to some EU countries.

"Yes, but under communism there was no official unemployment and unofficially, too; everybody had a job and there was a punishment for not working. There was over-employment but it was a political decision. But now we have a problem of what to do with people. What is serious is the increasing average length of unemployment. Around half the registered unemployed have been so for more than one year."

Statistics in Lithuania

Quick and eager to learn

In February this year two of Dr Kestutis Zaborskas's staff attended a Training of European Statisticians course in London on effective presentation to the news media. Part of that was a visit to the Bloomberg financial news agency who said they would welcome statistics from Central and Eastern European countries for distribution to their clients worldwide. Back in Vilnius Director-General Zaborskas seized on this idea and now once a month Bloomberg receive a special news release from the Department of Statistics of the Republic of Lithuania. This means that the world now has instant access to key data on Lithuania.

This is a typical example of the eagerness to learn and exploit opportunities demonstrated by CEEC countries and of the speed of development. It is a dynamic process typified by people like Dr Zaborskas.

When I spoke to him during a break in the Steering Committee meeting he was full of enthusiasm for such meetings and the links with the EU.

"They are very useful because for the first time we are talking about how to integrate our statistical system with the European system. We very highly appreciate the assistance from the European Union, particularly in the area of statistics - computers, software, training etc. It is the best investment in the world for us."

What were the biggest challenges he faced?

"Without assistance from the EU - the Phare programme - it would be impossible for us to implement a lot of the standards used in Western European countries. Right now the situation in our statistical office is not too bad in such areas as the consumer price index, producer price index, construction price index, exports/imports, business statistics, national accounts, although it's not a hundred per cent by EU standards.

Mr Kestutis Zaborskas

"In other areas of statistics we need to improve - in theory this is possible only with the assistance of the European Union and bilateral agreements, for example with Poland and Germany. We also hope it might be possible to make such an agreement between Finland and the Baltic States including Lithuania. And per-

haps this year it will also be possible to sign a bilateral agreement with Denmark.

"All this is learning by doing. On a theoretical level my staff are not bad but they need new knowledge about what to implement, what to improve..."

55% of Lithuanians want EU membership

All this, we agreed, was obviously gearing up to a bid to join the EU? How did people in Lithuania regard such a prospect?

"According to a special survey approximately 55% want to join the EU and 15% don't know."

When might it be?

"I think approximately five years, maybe seven."

What, I wanted to know next, was the status of official statistics in Lithuania?

Dr Zaborskas: "The reputation of statistics in all countries of the former Soviet Union is not very good because statistics were used in a certain way and there were many secrets. A lot of people think nothing has changed but I know many politicians are thinking differently now. A special conference for all Baltic States on building confidence in statistics was organised. The idea emerged last spring when Mr Franchet, Director-General of Eurostat, was in Vilnius. Politicians, our Prime Minister, MPs, researchers, scientists - have attended."

What, I asked, was the most important step in building such confidence in statistics?

"It is very important to make statistics very open to society - to make sure people know the way we operate, the methodology we use etc." And, we agreed, equally important was the separation of statistics from the political process.

Representatives of CEECs on the TES course in London on presentation of statistics to the news media visit Bloomberg financial news service. Delegates from Lithuania are in the foreground

Said **Dr Zaborskas**: "Right now many political forces using the statistics are saying they are not right while the government are saying they are OK. This makes it vital for us to be neutral and independent.

"Our office belongs directly to the government but it is absolutely an independent organisation - just like statistical offices in the Netherlands, Sweden, Norway and so on. I haven't had any special requests or requirements from the government. Whatever I do is OK. We have absolutely the democracy position from our President and our Prime Minister.

'Things have changed'

"Not everybody understands this. Many people think the position is the same as it was under the former Soviet Union. That's part of the challenge: to try to persuade people that things have changed."

What, I asked was the role of the press in this process?

"I think our press tend to write about statistics only from 'the other side' - these data are not correct, such and such a thing is not going well etc; although some newspapers do try to explain things correctly. We shall work with the journalists more closely, more openly, so it will be possible for them to understand our problems better."

And the most interesting statistics about Lithuania at present?

The Director-General is quite clear on this point: "Investigation into the hidden economy."

And its scale?

"It is approximately 25-27% of GDP according to our estimation. But it is very difficult to say. I suppose this is typical for all transition countries. It also went on under communism, of course, because it was the only way many people could make a decent living."

Statistics in Albania

'Our ambitions are very high'

"We have a lot of work to do because ambitions are very high, but we need more human and financial resources." This was Mrs Ekonomi Milva, Director-General of the Albanian Institute of Statistics, speaking.

"In Albania in the past we had a central economy and this was reflected in our statistics. Now under a market economy we have to construct a new statistical system. It's not so easy for us to start everything from the beginning. At present we are starting to establish our priorities for the period ahead and a plan of work, and cooperation with Eurostat has been very important to us.

"In this meeting we have been discussing the working of the Steering Committee and of the liaison group and also pre-accession action such as pilot projects. I consider that in some cases pilot projects are much more important for Albania than for other CEEC countries.

"If we consider a pilot project as a tool to help the statistical office in its development, it is useful if it can be linked to technical assistance. With a pilot project you have to create a service and learn how to do it, but you also need a way round the problem, which is where technical assistance comes in. Countries like Albania need a lot of help so it is valuable if pilot projects and technical assistance can be linked together."

I asked if Albania needed a lot more assistance than other CEEC countries.

Mrs Milva: "If we compare ourselves with other countries one of the problems is the base from which you start. Our base was very small. In comparison with the other countries we have made a lot of progress but we are still not at the same level."

What were their biggest problems?

Mrs Milva was quite sure about this. "National accounts: ours is not a system in itself - it needs to have links with other systems of statistics. We see two priorities here: one is to set up provisional estimates while at the same time we have to establish the statistical methodology of the national accounts system."

We then talked about measuring inflation in Albania.

"We first established the methodology of calculating the CPI with the help of the IMF in 1991/92. Since then, as a result of changes in government expenditure patterns, we have revised the CPI, and changes between the months are now very high compared to monthly changes last year. The increase this month was 2.6%. The annual rate last year was only 7%."

The reason?

"Next month we have elections so the government increased public sector wages. This immediately increased market prices. In the meantime production is still very low, agriculture is strong but not as strong as we would like, and services are in a state of change. Also financial assistance from outside is decreasing. Another thing that doesn't help very much is the balance of foreign trade."

Unemployment falling with mass privatisation

What, I asked, about unemployment?

Mrs Milva: "It fell from 13% in the third quarter of last year to 11% in the fourth quarter: we have mass privatisation that is taking people into the workforce."

So many changes, such a fluid situation, many things for the Institute of Statistics to measure and important it measures them accurately.

What sort of resources did they have to do the job?

"It is a very small office - in total 140 people in the Institute of Statistics. In addition we have people in the regions. Albania has been divided into 36 administrative regions and in

each one we have an office with one to three representatives."

What sort of status did official statistics enjoy in Albania?

"I think we have strengthened our role. But there are two things to understand. First, in the past it was very difficult to discuss anything with the news media - now we can and we send our data to the media. Initially it was very difficult but we have now established a system of communicating figures to the media. Second, we are the only people producing the data so everyone has to accept our figures - we have presented our methodology and our figures have been accepted. But how the government is using the figures is another matter."

'We have relative independence'

What, I asked, about their independence from government?

Said **Mrs Milva**: "I can say that we have relative independence from the government. Perhaps this is because we don't produce so much at present and what we do produce is quite acceptable."

Did they have any protection in law - could the Prime Minister, for example, require them not to put something out or influence the timing?

"We have a Statistics Law approved in 1993 which says our data are the official data of the country and up to now we have never had this type of discussion with the Prime Minister.

"One of the figures much commented on in the country at present is GDP. At the moment we do not calculate this - it is done by the Prime Minister's office. With other figures we have not had any kind of this problem."

Mrs Ekonomi Milva

What about Albania and EU membership?

"This is a desire and with a desire you start from yourself - so we have to consider what Albania is doing for itself to be a member of the EU. We must do our best so others can assist us in achieving this."

Did people want to join?

"Yes - it seems that they are very optimistic. In statistics we have already started, with classification definition and methodology, to be comparable with the EU."

A key focus for the meeting was on macro-economic statistics. Delegates were told...

'We shall have to roll up our sleeves!'

Mr A de Michelis, Head of Eurostat Directorate B, told the Committee that in this pre-accession phase high priority was given by the EU to macro-economic data - national accounts, prices, monetary and financial and foreign trade statistics. "The goal we are proposing is progressively to bring your countries to the point where they can be included in the European statistical system - totally, as regards macro-economic statistics - by around the end of next year.

"We have started to think about preparing the statistical programme for 1998-2002. We think that macro-economic statistics should be an integral part of the whole system and involve the participation of your countries as well."

Mr de Michelis said Eurostat had decided on a phased programme for integration of CEECs' macro-economic statistics with those of the EU. First step was to identify the "partners" in each CEEC country responsible for providing statistics. These might not necessarily be the national statistical offices; for example, they could be the central bank or some budgetary authority.

Second phase was to identify existing statistics. "We don't start from square one: a lot is already done by OECD, IMF, ourselves, the UN ECE in Geneva. But we need - quickly - a data file of existing CEEC statistics."

Next phase was to identify the users within the Commission and the top priority data that would be part of the first package required by the Commission for the preparation of pre-accession negotiations.

Fourth phase, continued Mr de Michelis, was to set up a structure with four working parties - covering national accounts, financial accounts and financial and monetary indicators, price statistics, and purchasing power parities as well as balance of payments. These would organise questionnaires aimed at analysing and cataloguing the strengths and weaknesses of the different CEECs' macro-economic statistics.

"They will pinpoint problems and after that we shall have to roll up our sleeves and get down to work in your countries with the help of Member States. They will help you set up this programme in the next few months so that once we have identified the defects in the system we can solve the problems.

'Don't underestimate the challenge'

"We shouldn't underestimate this phase of the programme, which is very important. For example, for the present EU countries to calculate comparable GNP figures took us ten years to identify the necessary data, the differences between various countries and the different interpretations of the European System of Accounts. We had to come up with a concensus on common interpretation and currently we are in the terminal phases of this harmonisation of GNP.

"It is particular demanding exercise in macro-economic statistics to live up to this challenge, because this requires close co-operation between general statisticians, central bank statisticians and officials from various ministries concerned (finance, economic affairs etc). It took Eurostat many years, given the different organisational structures, to establish such close working relations among them through the Committee for Monetary and Financial Statistics and Balance of Payments (CMFB). The CEECs will have to do likewise and will, of course, be able to profit from working within the framework of the CMFB."

The top table: left-to-right - Mr A Chantraine, Head of Eurostat Directorate C, and Mr O Crocicchi and Mr P Amor of Eurostat Unit C5

"There are other examples in price indices, accounts of public administrations etc. We are currently doing an in-depth job to identify the differences in various existing Member States and, of course, we can benefit from this experiment in applying the same methods to your countries."

A report presented to the Steering Committee and supporting Mr de Michelis's remarks said that, following these phases, sector and country specific improvement strategies would have to be developed. This task would be assumed by Eurostat and the CEECs supported by the joint working parties. If appropriate, organisations such as OECD and IMF would be involved, as would the national statistical offices of Member States that stood for best Community practice in areas of specific concern.

The four working parties would assess progress at their meeting in May 1997. With CEEC data having come on stream they would have to find suitable arrangements for the parties involved for checking and distributing the data.

A CEEC accession newsletter might be considered. This could inform potential users about

- progress of work in this field of macro-economic statistics
- data newly available
- remaining shortcomings of available data, and
- limits to the use of these data.

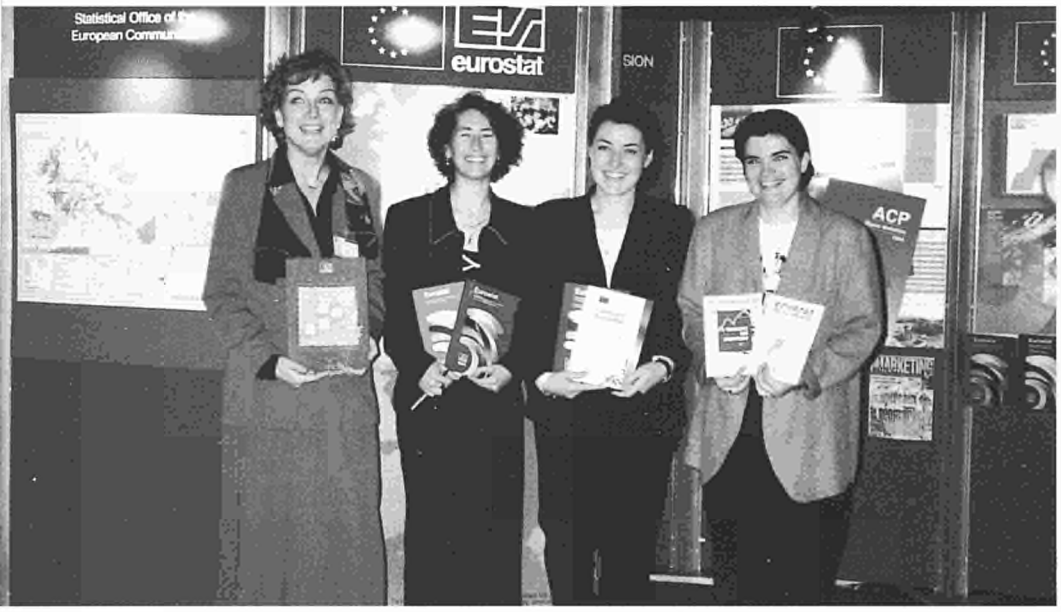
The Eurostat report gave this assessment of the outlook as far as all this work was concerned:

The proposed strategy has an evolutionary and highly flexible character supposed to be capable to cope not only with the diversity and complexity of the mission but also with its urgency. Moreover, if work gets under way according to the outline plan, it can be expected that reasonably adequate macro-economic statistics of use to policy-makers will become available.

At the same time it can be expected that statistical integration will equally be enhanced. Consequently, when the CEEC accession takes place, less work will have to be done to bring CEEC macro-economic statistics in line with statistical practices and statistical legislation of the European Union.

Eurostat on the information markets

Fruitful exchanges between producers and users



From left-to-right: Josephine Oberhausen, Catherine Wasielewski, Valérie Calmet and Cathy Waldura (Eurostat, Directorate A) tried to answer all the numerous visitors' questions

At the beginning of April two events supported by Eurostat took place simultaneously at Paris La Défense.

Mari 96 Europe was about localised data and geographical information systems (GISs). The presentations dealt with GISs and local authorities on the basis of actual cases experienced, geomarketing and the legal aspects of geographical information. While taking part in the exchanges and visiting the stands, Eurostat's representatives, Daniel Byk and Josefine Oberhausen, noted that there were more exhibitors than on the previous occasion.

The **Info'tools expo** was a forum for broader discussion on data and information tools. Here, too, there were three presentations to help visitors to learn more about the subject: "The new data economy" (the intangible economy, trade on Internet), "Data, the hidden wealth of businesses" (Information Marketing System, motor vehicle marketing) and "Quality and production of data" (consumer panel, ethics, data protection).

Eurostat had a stand at each of these exhibitions. Eurostat's various products were presented by Josefine Oberhausen, who is covering this project, the GISCO database. The public, which was particularly interested in the codification of NUTS, especially NUTS 5 (municipalities), found the demonstrations convincing but expressed regret that the data at this level were still confidential!

Highly specialised, the visitors to the Eurostat stands asked specific and practical questions. These visitors included experts from government bodies (CNRS, senior town and country planning officials) and major companies (SNCF, Michelin), architects, town planners, a few university staff and above all consultants, the distributors of information.

In April, at the Cité des sciences et de l'industrie de la Villette in Paris, Eurostat organised for the second year in a row, with the participation of, in particular, the International Statistical Institute and 01 Informatics, the first information and communication systems journal, "**Stat'expo**", the "Data users' rendezvous".

The plenary conferences provided an opportunity for exchanges between the various partners (public sector, marketing, banking and insurance, information technology, teaching, human resources, finance, opinion polling etc) on a number of topical subjects, including "Statistical sources and international comparisons", "Confidentiality and data protection", "Statistics, marketing and geographical data", "Legal aspects and professional ethics", "Survey methods","Internet and statistics" and "Statistics and industry".

In the exhibition section Eurostat together with the NSIs of Austria, the Netherlands, the United Kingdom, Germany, Spain and Italy was able to demonstrate its main products alongside its partners, Eurocost, DEBA and RISC and establish important contacts. The Mari Europe/Info'tools exhibitions, which were held one week earlier, seem to have overshadowed Stat'expo.

To achieve greater diversity, it is planned to hold Stat'expo in a Member State other than France.

Dr Popkin's prognosis on measuring inflation...

A hot topic that refuses to die

by Barbara Jakob

"Every time I thought, the subject was dying, it didn't happen." Noted US economist Dr Joel Popkin speaking at Eurostat in Luxembourg. He was invited by Alberto De Michelis, Director at Eurostat, to address the subject ***New challenges for price index measurement.*** *As Dr Popkin remarked, against the background of the Maastricht Treaty convergence criteria on price stability, this subject is once more a "hot topic".*

Dr Popkin has worked in this area for over 30 years. First, in government: he was Assistant Commissioner for Prices and Living Conditions at the Bureau of Labor Statistics, and later at the Council of Economic Advisers. Since 1978 he has run his own economics consultancy company. As he told *Sigma*: "The issues are changing but it continues to attract interest."

Focusing on the Consumer Price Index, "which we used to think a pretty clear concept", Dr Popkin highlighted current problems and future challenges:

- ***Is the quality changing or the price?***
- ***How to treat housing costs and the problem of substitution effects among items?***
- ***And finally: Whether the CPI under- or over-estimates inflation. "This debate was on the US agenda a few years ago and is now being strongly discussed in Europe."***

On the alleged "CPI bias", Dr Popkin had this to say: "Statisticians should measure what they can measure and not just what they can speculate about." Nevertheless, he is convinced that there is still room for a new index aimed at measuring "inflation" more generally. "There is something in the air which needs to be developed."

The UK's current project of a more general price index, the "whole economy price index", to be published on an analytical and trial basis within the next few months, may be seen as reinforcing his view.

Harmonisation 'a nice word for compromise'

For Dr Popkin the most important thing in the harmonisation process was that "what we end up with is still relevant.

"Harmonisation is always a difficult thing", he said, "because there is so much diversity in each country's practices. It would be better if we could start with a clean slate and do it the same way from the start but we don't have that luxury. We live in a practical world; we have to compromise – and harmonisation is a nice word for compromise.

"In the short run harmonisation is a burden", he admitted. "In the long run it's a chance. It may seem difficult at the beginning but you may in fact find something better in the long run.

"The next step in the field of price measurement will go beyond programmes", he went on. Future challenges would be to shape the course of measurement. He suggested building up a system of price indices, for example, that could help to answer some current questions such as the influence of industrial price indices on the consumer price index.

"I think", he concluded, "that policy-makers are relying more and more on price indices. They are discovering that they have particular purposes. They have to know the purpose for which they want an index, how to use what is being produced and how to produce additional indices.

"Increasingly policy makers will need a variety of measures and statistical agencies will have to meet the challenge of producing them."

Falling beef prices: Quality change or falling price? John Astin (l) and Don Sellwood (r) of Eurostats B3, the price comparison unit, discuss CPI challenges with Dr Popkin (centre)

In the latest of our profiles of national statistical offices, Sigma's JOHN WRIGHT went to Statistics Denmark in Copenhagen.

Statistics & the man from Mars

If the proverbial man from Mars came to interview Jan Plovsing, Director-General of Statistics Denmark armed with only a cursory briefing on the European way of life he might not receive quite the answers he expects.

Director-General, Jan Plovsing

The Martian's list of questions might include

- How many Danes have a job? Indeed, what is a job?
- Why do a million "active" Danes receive state benefits?
- Who owns Danish companies?
- May I meet a Danish housewife?

Denmark has a reputation for being in the vanguard of European social development. But, talking to Plovsing, it is difficult not to feel somewhat bemused by what is happening in the country today, the extent to which it mirrors trends elsewhere in the EU, and the challenges it presents to the statistician. And I am from Oxford not Mars!

So let us first address the Martian's questions...

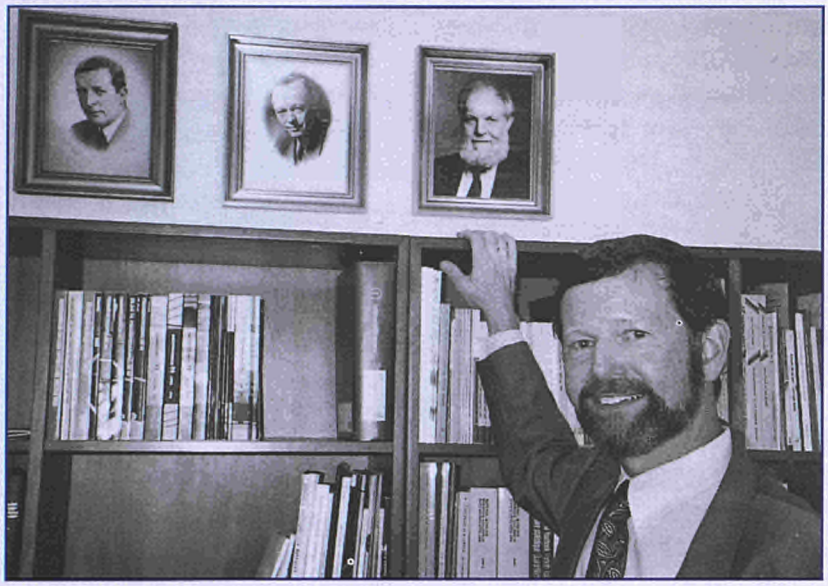
Danes & jobs

Says **Mr Plovsing**: "Labour market statistics are an area of wide political interest. We publish unemployment figures every month and employment figures every three months. There is a wish from our Prime Minister and other political parties for employment figures every month.

"The situation in Denmark - probably in many other countries - is that unemployment figures are only part of the picture. You could have rising unemployment and, at the same time, rising employment. The general population thinks rising unemployment must mean falling employment. But that's not necessarily true. And for the Government, of course, it's very important that they can show that the number of jobs is increasing, especially in the private rather than the public sector.

"They want employment and unemployment data together because of the partial picture of the labour market given by the latter, especially in Denmark where we have the complication of special leave arrangements - parent leave, leave for education, sabaticals - and a lot of job schemes for people without permanent work.

"I feel the way we are covering the labour market today is not quite up to what has happened. Of course, a major survey could produce employment figures every month but (much emphasis here!) we can't afford that.



Mr Plovsing with his immediate predecessors as Director-General

STATISTICIAN WITH WEAKNESS FOR OPERA

Jan Plovsing (51) has been Director-General of Statistics Denmark since 1 April last year. The job was advertised following the resignation of Hans Zeuthen. Mr Plovsing moved over from the Danish National Institute of Social Research.

"A convincing choice in terms of leadership, a forceful personality and other excellent human qualities", wrote one Danish newspaper. It continued: "He has the ideal background for this: during his five years' leadership of the National Institute of Social Research he has transformed its reputation from something of a mess to that of a serious working research institute of vision as well as international outlook."

"And made it a good business as well", another 'paper added. "He led the institute through a series of outstanding and reliable studies, the latest a comprehensive one on how social and labour market conditions compare in Europe."

Mr Plovsing was a member of the EC's Advisory Group to Combat Poverty from 1977-78 and has been a member of many other important committees on social security matters. He has lectured as an associate professor at Copenhagen University and other academic institutions and has written several books on social security matters.

Colleagues and friends describe him as a benign, cheerful and positive person. But before taking up his post as Denmark's top statistician he had a reputation as someone often harshly critical of some aspects of the Danish welfare state.

In private life his ambition is to see as much of the world as possible. His energy comes from "gardening, jogging and reading plus annual Norwegian winter holidays". Oh, and he admits a weakness for opera. "

"What we are actually doing is a major project called labour market balances, which is supported by the EU social framework. The idea is to combine all kinds of information we have about employment, unemployment, job offer schemes and so on in one coherent system like the national accounts. We would then always be in a position to make projections of movements in employment. A very exciting project if it succeeds. This work is very much inspired by our Dutch colleagues.

"In the old days it was much more simple. There were people out of the labour force - housewives, students... Then there were the employed and the unemployed. Quite separate groups, easy to understand and define. In Denmark we now have a wide variety of wage subsidy systems, job offer schemes, many kinds of activity for the unemployed. All this makes it complicated even for a specialist to square with ILO definitions etc - are they unemployed, are they employed?"

I remark that our Martian's simple question "How many Danes have a job?" wouldn't be easy to answer.

Plovsing: "We would have to say: `There are the normal jobs in the labour market and then there are the special jobs where there could be a wage subsidy. Then there are the special jobs created for the unemployed persons. Do you mean all of them or what? What do you mean by a job?'"

Director **Lars Thygesen**, who is sitting in on my interview, comments: "The easiest thing, I suppose, would be just to give him a figure!" We all laugh.

The Danish housewife RIP

The Martian would also find the concept of housewife almost as alien as himself in Denmark today. "The housewife is dead", says **Plovsing**. "Maybe a few in their 50s and 60s but but almost none in the younger generation. So that's not a complicating factor in our statistics.

"However, there is speculation that the unemployment figure for young mothers is very high. Why is that: is it because some of them choose the status or because they can't get a job? Then, if you have had a job and have a child, first you have half-a-year on maternity leave and after that you can have parent's leave, all paid for.

"Unemployment benefit is 11,000 kroner a month. It could be compared with what you earn in a low-wage job. So is unemployment all unemployment or covering some people choosing not to work? This is a discussion in many countries.

"So we want to create a system in which we could publish figures that are a coherent and a more correct picture. I don't think our problems are greater than any other countries but I think we have a wish to be in front in this area.

Thanks a million

"One other major social trend in Denmark in recent years has been the steady growth of the number of people on state income transfers - retirement pensions, sickness and unemployment benefit etc - even in a situation of reasonably good economic development when unemployment is falling.

"There are several reasons. One is that Government has decided that the social welfare state should expand. There is considerable political debate about this development. Can we afford it in the long run? We have a population of 5.2 million. About one million from 18 to the retirement age of 67 receive state transfers. Then there are the old-age pensioners.

"Social security and health spending together cover half of the public budget."

Who owns Danish companies?

And so to the Martian's final question.

Says **Jan Plovsing**: "Another major change in Denmark is that within the business sector. For instance, are we capable of measuring transactions in all kinds of services correctly? Most business statistics are based on the concept of an industrial society, but we are becoming more and more an information society. Are we covering these processes? I don't think so. Of course, it is not a major problem now but it will be in years to come if we do not change our systems to cover the service sector better.

"We have a business register in Denmark like many other countries. If our Martian asked the question 'Who owns Danish companies?', could I give him a correct answer? No, I couldn't. First of all, because we don't have the information. But let's suppose we did have it on our business register. With the increase in globalisation, it will be even more difficult to keep track of who controls businesses. We could have information so long as the owner is a Danish citizen, but if Danish businesses become more and more foreign-owned, which I believe will be the case, and Danish people increasingly own businesses in other countries...well you can see the problem.

"You could say that what is happening is that the national borders on which our statistical systems are built - and which are a prerequisite of our statistical activities - are, in some areas at least, becom-

Traditional industry may be giving way to services and the information society but Denmark is still famous for hand-painted Georg Jensen porcelain

ing more and more unimportant. This means it will be difficult to measure what is going on in Denmark - or, indeed, in other Member States.

"Intrastat is another example. With the growing integration of the EU economies, the idea of measuring trade between the countries is becoming less and less interesting. I don't believe they do it between the United States and I think this will be the case in Europe in future years."

Jan Plovsing concludes: "Like many we are discussing in this interview, these are serious and difficult questions, which I don't have the answer to. But such questions are ones that we, as statisticians must respond to, and which will make life even more difficult for us."

Statistics Denmark & the EU

We are now assuming that the Martian has flown home to rewrite the briefing material on Denmark. Now to other questions...

How, I ask Plovsing, does he view the position of Statistics Denmark within the European statistical system?

"We are very positive towards harmonisation of statistics throughout Europe - and the whole of the world, if that's possible. But in our relations with the EU we stress time and time again that we very much prefer harmonisation of output not harmonisation of input - data collection. The main reason - and what singles Denmark out with other Nordic countries - is our great emphasis on register statistics.

"The major part of our information comes from registers so we do very few surveys. We can't afford because of our scarce resources, and certainly wouldn't like to when we have the information on registers.

"The wish of Eurostat and the Commission for more and more statistics must be balanced by what we can produce. Firstly, they have to realise that most countries have scarce resources and that we can't meet all their demands. So there must be more planning and more setting of priorities. We should very much like to take part in that discussion. But there is a limit.

"Another limit is the burden of response on companies and small firms. This has been a very hot issue in Denmark for the last year.

"Companies think this burden is too heavy, especially small and medium-sized ones. This is the case in many countries but we have a hard time in Denmark discussing this with politicians and organisations representing such companies. The statistics need to be extremely important if we are to increase this burden.

"We should prefer the other way round and make the response burden easier for businesses. And we think we can do that - and we have plans to do so - by building up registers of business statistics more than we have so far.

"People in Denmark are almost totally covered by registers for statistical purposes - we have very few surveys. We have the labour force survey and the household budgets survey. Those are the two major ones.

"Participation in surveys is voluntary because we don't have a census survey any more. We have a census every year using registers."

He who would deceive the Martian! Director Lars Thygesen

I ask if this gap between Eurostat demands and national statistical offices' ability to supply is widening?

Plovsing: "Widening or not I am not sure, but there is a gap. Let's take an example: the draft Commission regulation on short-term indicators. In general we support it. But on certain specific points it is much too detailed, and we have said so. However, there does seem to be a growing understanding in at least some parts of Eurostat that it's better that we reach an agreement on this issue than pursue a more controversial line.

"Such regulations are important but too detailed and they must understand that collecting such detail puts an immense burden on respondents that we find very hard to explain. It also causes political problems."

Character forming

This prompts me to ask how good the Danes are at filling in statistical forms?

Plovsing: "I think very good compared to other nationalities. This reflects our national character (and that of other Nordic countries) and also, in a sense, our attitude towards the EU. We often sound a little critical because we express ourselves more directly than other Member States (except for the Irish!). But when we reach an agreement we stick to it - we do what is required. And the same with the Danish people: the response to statistical requests is normally quite high, but there can be a lot of discussion beforehand."

Kim Voldby Pedersen, who has special responsibility for international affairs at Statistics Denmark, and his secretary, Else Holstein

So does he regard Danes as "good Europeans" in the statistical sense?

"Yes, surely. We want it to be one system and expanded to other, eastern European countries. We feel part of it and want to be part of it. We also allow ourselves to be critical if the system is too detailed, if the demands of the Commission and Eurostat are out of proportion with the resources they have and we have."

I want to know how sympathetic the Danish Government is to requests for extra funding for EU data?

Much laughter from Jan Plovsing and Lars Thygesen. "We have had problems for many years", explains **Plovsing**. "The system doesn't work in that way. If Eurostat says we have to do something and we agree, then we can't go to the Finance Ministry and say `Let's have what it costs´. We wouldn't get it. Probably, if we had a very strong argument, we might get half or a third. But to meet the shortfall would mean this institution having to be even more efficient and effective."

What proportion of the Statistics Denmark budget is for EU work?

"I couldn't give you an exact figure, but half a year ago we had to explain to our Government the very limited scope for changing some of our priorities, because most of our statistics are a consequence of EU regulations or agreements."

And where, I ask, does their money come from?

"We have a Government grant - decided upon by Parliament - covering 70% of our total budget. We earn the remainder by `selling´ statistics.

"The grant is 170 million kroner; in addition, we earn 80 million kroner ourselves. In theory we can use the money as we like but in practice much of it is limited to programmes we have to carry out. But we do have some freedom, yes. It is possible to exceed our income one year if we spend less the next .

"Raising money through `commercial´ activities is one of our major challenges. But we do try to draw a line between the statistical programme financed mainly by Government, Eurostat etc and selling statistics for special purposes to customers, researchers etc. We don't think the service programme exists to create major revenue.

"We sell data for the cost of producing them, including indirect costs, not to produce revenue for the regular statistical programme. This division isn't an `iron curtain´, but the main idea is that if the Government comes to us and says `We need to cut your budget´ - which they do most years (next by 2%) - then our response is either we have to be more efficient or cut the statistical programme. We don't believe special customers buying statistics should finance the regular programme. They should finance what they receive."

PLOVSING ON STATISTICS FOR SALE...

We reorganised last autumn and set up a whole new department for user services which Lars Thygesen is heading. The idea is that, even though we think we are pretty advanced in many aspects of selling statistics and responding to user needs, we think we could be better. The main purpose in expanding this activity is to allow statistics to be widely used, and not to earn money but to cover our costs.

In the information society that we already have in some respects but that will be more pronounced in years to come, the type of information we can offer will be more and more in demand. If we don't offer these services maybe other - private - organisations will step in. We think it is better if such information comes from an independent source likes ours rather than one we don't consider independent. Also it's better we do it than another government agency that might be much more politically influenced - or a special-interest group.

We think statistics should be impartial and come from an impartial body like Statistics Denmark. We think we should have a central position in the information society.

Biggest challenges

We turn now to the biggest challenges faced by Statistics Denmark at present.

Explains **Mr Plovsing**: "In Denmark there is increasing demand from Government for more timely, faster statistics, and even more statistics in areas that we are not covering yet. At the same time we have these slowly decreasing grants. So one of the main challenges is more and better statistics for less money. You should also be aware that compared to Norway, Sweden and Finland our institution is the smallest - around 600 staff. We feel that we are not a very rich institution.

"Recently we decided on a new strategy for the years ahead - Strategy '96. We are setting many goals for each statistical area, but the main theme is producing high quality statistics faster than than we are today.

"Another challenge is reducing the statistical response burden on business in several ways - through, for example, more modern technology (EDI). We aim to obtain data using what businesses have in their administrative systems instead of requiring them to fill in questionnaires to us - in systems they have for accounting, salaries, wages, and so on. We are already doing something in this area but we want to head more in that direction to reduce the burden on smaller businesses. This is a major challenge because of the political interest."

Clearly the political pressures on Plovsing to "do something" about this are substantial.

"Some of the newspapers have been very critical", he says. "We have a Minister for Business who has also criticised us for putting too heavy a burden on businesses, and some political parties have also raised their voices - Opposition as well as Government.

'When a ball starts rolling...'

"It started last summer when we sent detailed questionnaires to the building and construction industry and the retail trade about their finances and accounting. Many of

In the print shop at Statistics Denmark

the questions were part of the coming EC regulation on structural statistics - we are a little ahead on that. And much of the information is for our national accounts. Maybe it was too detailed; I am not quite sure. But it had to go to branches of industry with a lot of small businesses. That raised problems.

"Oh, and Intrastat - that's another thing. I don't know why it came up last summer - it could have been before - but when a ball is rolling more and more things roll with it. Oh, that system is too detailed - Intrastat."

I ask if a lot of this criticism is also directed against "Europe"?

"We have tried to explain that one of the reason we are doing this is

because of EU requirements, but I must say most of it falls back on us."

Adds **Lars Thygesen**: "But there's also criticism of other public authorities who ask questions. It's not only us - it's `the government´."

Plovsing: "The ball is still rolling. The Government has set up not just one committee but several to see what can be done to reduce this burden. The Government also announced that it would seek to change Intrastat - take some initiative in that direction."

Spotlight turns green

We turn to other challenges...

Says **Plovsing**: "We would like to do more on statistics on the environment. We feel this is an area of growing importance. In many countries there is concern about how and to what extent it is getting worse and we have decided we must play a major role in creating the statistical information system needed for taking political decisions.

"I don't think we fancy `green accounts´ if they should be understood as replacing traditional national accounts, but we should like to go in the direction of satellite account systems.

Cars do not dominate Copenhagen in quite the same way as they do other cities. Pedestrians have freedom - and the bicycle is a way of life

Young members of staff of Statistics Denmark take a break on the roof

"We need to measure pollution - of water and air and so on... But also statistics on waste disposal, which we are also expanding, and energy balances. In fact our major area of expansion right now is energy: measuring where it comes from, where it goes, how much is consumed and for what purposes, in industry and private households, and so on."

Curbing the car

I observe that Denmark seems to be one country in the EU that has some success in curbing the motor car. There are actually spaces between the cars in Copenhagen and even places to park!

Plovsing: "I think you have to pay three times the basic price of a car in Denmark. Two-thirds are taxes."

I ask if this was a conscious decision by Government in the past to control the car or a means of raising revenue?

"I think the latter, but now it is simply impossible to change because it is also seen as protecting the environment."

Thygesen: "Originally it was an attempt to keep down imports, which were a problem in the '50s."

Does it work?

Plovsing: "I think so, and I also think that the average contents of a car park in Denmark are older than in many countries!"

He adds that there is a lot of concern in Denmark about the environment, that they started rather late with statistics in this area, have had great difficulty obtaining funding for it, and are behind many Member States.

What would you have to do to get fired, Mr Plovsing?

We turn now to the independence of Statistics Denmark. How does it fit into the political structure?

Plovsing: "We have full independence in professional matters, including choice of subjects covered. What is more of a Government decision is the total budget. We are under the Ministry for Economic Affairs and budget and also some staff decision are taken by them. I am a civil servant equivalent to permanent secretary of state. So I have direct reference to the Minister."

What, I want to know, does he have to do for the Minister to fire him? Is it possible?

"If my behaviour was out of order but it should be something very special. I think the general answer would be `no'. But, on the other hand, you couldn't be quite sure, of course, that you wouldn't be moved to another position, or something like that, if there was a major political wish for it. At least my position is much more secure than that of permanent secretaries in some of the Ministries, because there is a wide recognition that this institution should be independent - that it should not be under political pressure, because statistics should be impartial."

The big question: does the Government see key data in advance of publication?

"Our news releases are at 9-30. Half-an-hour before we send the release by fax to the Minister of Economic Affairs - the first time she has seen it. This offers no possibility other than to prepare for press questions."

What, I ask, would happen if she rang up the day before and said: "Look, Mr Plovsing, it is actually quite vital that I know the inflation figures before they go out tomorrow at 9-30?"

"She would never do it. I would have to say no. This is not a hidden thing. I would violate our own rules if I agreed to such a request."

Lars Thygesen: "This is a thing we feel very strongly about, but it's not a problem because the politicians respect it."

The interview ends. Like the Martian before me, it was not exactly what I expected. Denmark may be small - among the EU's smallest members - but it is dynamic. The same could be said of Statistics Denmark.

ON A HISTORICAL NOTE...

The first Danish population statistics were developed in the second half of the 18th century, but a government institution responsible for official statistics was not established until 1850. Since then most official statistics have been produced centrally by this institution, known since 1966 as Statistics Denmark.

In 1896 the institution issued its first statistical yearbook. So this year marks its 100th anniversary. As time has passed, it has become a vital element in the Danish debate on social conditions.

In the 18th century, population data were confidential because the enemy - the Swedes - might have gained vital intelligence from them. Later this went by the board and the first yearbook devoted 28 of its 200 pages to population data. Causes of death comprised five pages of which two were devoted to suicide, which has long been a Danish preoccupation - and still is.

More detailed statistics on suicide were published in the 1911 yearbook. On page 23 we read that the total number of suicides from 1896 to 1905 was 4276 men and 1200 women, including 93 men and 43 women over 80 years old. Suicide from May to July was more frequent than other months. Hanging was the most favoured method. The statistics even gave the reasons. Most frequent were the remarkably contemporary-sounding "melancholy, depression, spleen and mental disease."

Nowadays around 750 Danish men and 400 women a year kill themselves.

Baden seminar

Statistics and the regions

by Jean Drappier

Statisticians from 29 European countries met in Baden near Vienna on 5-8 March for a seminar organised jointly by Östat (the Austrian Statistical Office), Eurostat and the Commission's DG XVI.

With Mrs Lidia Barreiros, Eurostat Director (Social and Regional Statistics and Structural Plans), Mr Erich Bader, President of Östat, opened the seminar, which looked into the main aspects of regional statistics Eurostat should cover in future years. There were the following conclusions:

■ *Regional accounts*

It would be important to examine how Community methodology was being applied in each Member State or how it could be applied in fields currently being developed such as household accounts. Analysis of data should reveal any shortcomings. Despite the arguments put forward by Austria, which wanted alternative indicators developed, it was stressed that decision-makers generally preferred a single-figure basis for their decisions, comparable to other figures, even if this was not perfect in all circumstances.

■ *Local data and GIS (Geographical Information Systems)*

This subject aroused a great deal of interest and highlighted two different approaches: should GIS be constructed from a geographical grid - technically the best solution and one Switzerland was pioneering - or from administrative contours or census areas, such as Italy was developing? Data in Eurostat's local database SIRE should be widely disseminated.

■ *Urban statistics*

Although the EU was likely to be only marginally involved in this area, it seemed that greater cooperation would be needed in the drafting of definitions common to all countries. A feasibility study, spearheaded by Eurostat, was welcomed. A morphological definition of urban areas seemed to have the best chance of widespread acceptance.

■ *Geographical breakdowns*

Were functional areas preferable to administrative districts in the analysis? This question remained open.

■ *Registers and censuses*

Censuses were a vital source of data, especially at local level. But what did users require from the regional organisation of the next round of censuses? The registers were a valuable source of data from the point-of-view of costs and degree of detail, but led to confidentiality problems, and statisticians were not closely enough involved in managing them.

Dr Franz, Head of Östat's Social Statistics Division, who conducted the two-day seminar

■ *Regional disparities*

Some speakers deplored the lack of a reference framework. One suggestion was for work on the typology of regions. Up to now, the accent all too often seemed to have been on measuring disparities in economic rather than social terms.

■ *Databases and dissemination*

Statistics should be produced and disseminated more in response to user requirements, and cross-border cooperation could lead to interesting developments. Electronic dissemination was potentially very flexible.

Timely statistics

In his conclusion, Mr Yves Franchet, Director-General of Eurostat, looked ahead to the 21st century, emphasising that statistics needed to be prepared well in advance if they were to be available when required. He made the following points:

- increasing demand for regional statistics as Europe moved towards the goal of integration would bring into focus disparities between regions rather than disparities between countries

- the information society would highlight the importance of the quality criterion as applied to human capital and access to information. Serious thought should be given to how this phenomenon should be measured

- development of cross-border regional statistics could be a useful instrument for promoting European integration

- both collection and dissemination aspects of information technology - of particular interest for cartography and remote sensing - would be developed further

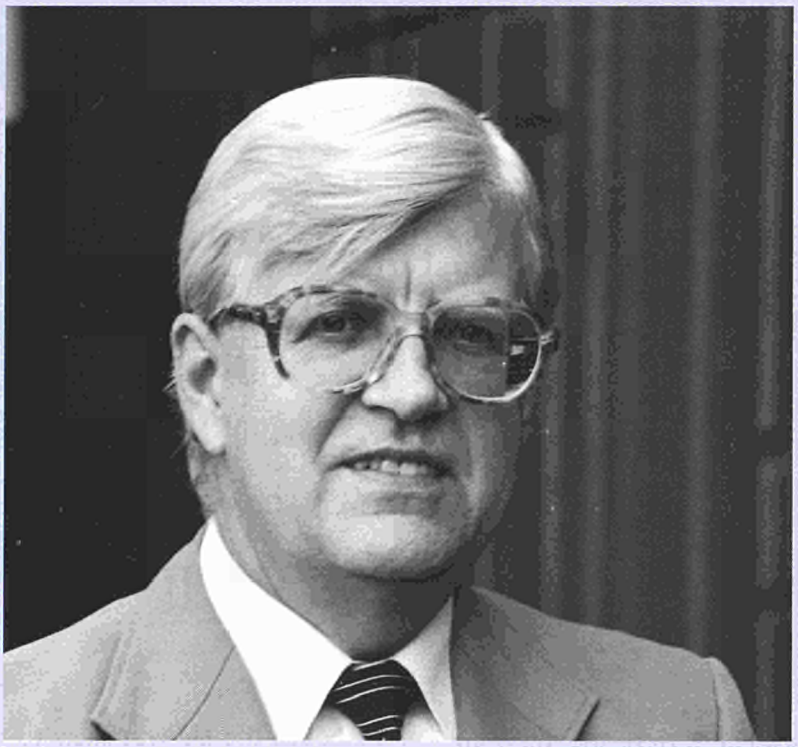
- Central and Eastern Europe countries were open to cooperation but would need a guiding hand towards integration

- work should continue on alternative methods of measuring regional disparities, with great caution in the use of results. A careful distinction should always be made between objective statistics and information used for political purposes.

Mr Banovec, President of the Slovenian Statistical Office, concluded that, although data might be collected on subjects bound by administrative frontiers which could be moved, the things observed were generally fixed.

This led Mr Bader to close the debate by highlighting differences in perception in Member States, within the Commission (Eurostat in particular) and in third countries.

The minutes of the seminar will be published by Eurostat.



PRESIDENT DELIGHTED

Mr Bader said: "One thing is clear: regional policies and statistics are looking towards the future, and will become increasingly meaningful. Individually, each country must do everything possible to meet these requirements. In our country we have a long way to go: the importance of statistics, and regional statistics in particular, has constantly to be pointed out in political circles. The supranational authority facing us demands ever more information. We must be aware that this Community is a vast area which cannot function without sufficient factual information, but at European level we should also remember that data should not be produced without regard to cost.The new challenges are in Central and Eastern Europe. They are addressed to all of us, since we all have the same objective. If it is to put up a good case for legitimacy, a harmonised statistical system needs an ongoing scientific dialogue and discussions of alternatives. As has been stated repeatedly at this seminar, we must be extremely open-minded in dealing with the questions raised by statistics and working out the right replies. We have had an extremely useful seminar promising tangible results. I have been especially delighted to welcome you here."

Easy access to Swedish Statistics

by Professor Bo Sundgren*

Statistics Sweden's store of data is often described as a goldmine for statistics users. Some users have nevertheless offered the criticism that panning that gold might have demanded too much in the way of blood, sweat and tears. The new database activities are a determined effort on the part of Statistics Sweden to make the gold accessible, even for those who want to analyse and refine Statistics Sweden's data in their own time, on their own PCs and with their own software. We call this "the new accessibility".

"The new accessibility" takes into account that Statistics Sweden must serve many different types of users, from the very experienced to the very inexperienced, from those with all the resources at their fingertips, who can buy any services, to the less well-off who can only offer their own time. A statistics user may be an employee in a Ministry, an investigator in a branch organisation or trade union, an analyst in a financial institute, a researcher, teacher, or student, a journalist or just an interested citizen.

Clearly, different types of users will make quite different demands on Statistics Sweden database services. We are therefore making an effort to provide a wide enough range of basic services as well as complementary services to satisfy these different needs. The basic services are inexpensive and, following the self-service principle, the user is required to do a large part of the work himself. The complementary services are aimed at those short of time but who would gladly pay to get more refined products and services.

Both the basic and the complementary services require a well-organised data store, with a well-documented and quality-declared content. A user must quickly and easily be able to find the statistics that are of interest to him. The user must also be able to determine independently whether the available statistics are of the right quality for his purposes.

In order to be able to offer many different services at a low cost, the database must be organised in a rational manner. Statistics Sweden has chosen to store both the statistics and the descriptions of their content and quality in a standardised manner, so that the user is able to find his way around, and so that any of the popular software programmes can be used for further processing.

Statistics Sweden is planning a large event, ACCESSUM 96, to include exhibitions, demonstrations and seminars, when "the new accessibility" will be formally presented to our users. The date set is 3 October 1996, and we expect to have about 400 participants.

* *Professor Bo Sundgren is head of unit for statistical information in the R & D Department at Statistics Sweden*

New Portuguese publication

The first edition of *Revista de Estatística* was published in May 1996 by the Portuguese National Statistical Institute.

It will appear three times a year, in Portuguese, each article accompanied by an abstract in English. It aims for a scientific approach to

- original articles on aspects of pure and applied statistics
- research and analysis in economic, social and demographic statistics
- news of major projects and activities in the Portuguese national statistical system
- news of conferences and seminars on statistical and related questions, and
- news of technical cooperation projects involving INE in bilateral or multilateral cooperation.

INE believes *Revista de Estatística* will become a prestige journal, eagerly awaited by authors as a means of making such studies better known, not only in statistical circles but also among the users of statistical methods and official statistics.

Another fundamental aim is that *Revista de Estatística* should address a readership beyond INE, internationally as well as within Portugal, and particularly (though by no means exclusively) the academic world. INE believes there is much to be gained from developing contacts and relationships, with individuals and organisations who might be privileged users of INE statistics and, by the same token, authoritative critics of their quality and suitability.

The INE hopes, through *Revista de Estatística*, to encourage a higher level of exchanges in statistical matters between organisations and individuals.

The first number of Revista de Estatística, *totalling 105 pages, included the following main articles:*

A quarterly leading coincident indicator of GDP

Evaluation of economic activity and the non-registered economy: contribution of household surveys to measures of the informal economy

Towards a sociology of statistical production: the advantages of symptomatic approach to statistical-information

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Further information on *Revista de Estatística*, on both subscriptions and submission of articles, should be sent to:

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A 'first' for Spain

Statistical dissemination is changing profoundly. New electronic media enabling storage of huge amounts of information at lower cost per copy, and access to remote services are leading the way. The CD-ROM Los Municipios CERCA, which contains data equivalent to 575 books of 200 pages, is a successful "first" for INE Spain in use of high-capacity storage for dissemination. Now other CD-ROMs will follow.

Los Municipios CERCA was released at the beginning of this year. This was the first set of statis-tical data ever distributed on CD-ROM in Spain. It contains nearly 3,000 items of data for each of the more than 8,000 Spanish municipalities (Nuts5). The data come from Spain's last agricultural, business, buildings and population censuses.

Besides the sheer amount of information, there are two other important features in this CD-ROM. First, it complements statistical data with an important collection of metadata, such as variable labels of several lengths, definitions of terms and descriptive methodological text. Second, CERCA features the software DIOGENES that allows user-friendly "navigation" through the database, personalisation of tables and graphs, production of statistical maps, arithmetical operations and downloading of datasets. DIOGENES is a computer system that handles numerical data; it has been developed by a Spanish private company.

The experience with CERCA has been very successful and has encouraged INE to continue its policy of using the CD-ROM as a medium for data dissemination. A new CD-ROM, containing population, households and dwellings data for the almost 40,000 census sections and other geographical areas below municipal level, is now being produced and was being released by the end of the summer. This new product uses fully the power of DIOGENES to handle the multi-dimensional qualities of statistical data and to incorporate metadata. Soon an English version of CERCA will be produced. This will translate both the metadata and the software-user interface.

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