

# European Rural Development (ERD)

## Project Description



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Please note that the geographical focus of this study is *all of Europe* (including the current EU member countries, plus all European IIASA member countries, plus all EU accession countries).

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## Introduction

This document tries to *briefly* answer some of the questions concerning the relevance and feasibility of the new IIASA project on European Rural Development. It also gives an overview of the project's objectives and methods. In a special chapter we outline the three major tasks of the project. Finally, the document describes how we plan to organize a network with institutes and researchers in several IIASA member countries, that have indicated concrete interest in collaboration. For more information please visit our web site at [www.iiasa.ac.at/Research/ERD](http://www.iiasa.ac.at/Research/ERD).

## Why are rural areas important?

While urban-industrial agglomerations are certainly the centers of economic and social development in Europe, rural areas will become more important in the future.

1. The **quality and reliability of our food supply** depends on the economic, political and social conditions of the agricultural sector and the state of our rural environment. Despite the emergence of global food markets, most of Europe's food is still produced in the rural areas of Europe. Contrary to popular belief, Europe is also a large *net-exporter* of food commodities.
2. Rural areas provide **vital natural resources** to urban centers, such as freshwater, timber, or biomass. These resources are becoming increasingly important - either because of their scarcity, or due to their special relevance for sustainable development.
3. Many sports and **recreational activities**, such as horseback riding, downhill skiing, hiking, rafting, climbing, playing golf, or parachute gliding, require the open space, the beauty, or the land-characteristics of rural areas. On weekends and during the holidays there is usually a massive movement of the urban population to the countryside. The beauty of natural and cultural landscapes are production factors in large sections of our tourist industry.
4. Many valuable natural ecosystems are located in rural areas. Some of them have a high density of endangered species and have been declared **biodiversity reserves**. Protected rural areas are not only important for preserving a rich gene pool for future generations, but also for educating urban populations about the beauty of untouched natural landscapes.
5. With an expanding transportation and information infrastructure and relatively low transportation and communication costs, rural areas in urban proximity are becoming attractive living environments to certain urban populations (such as tele-commuters, knowledge workers, or mobile business owners). In many parts of Europe we are facing a **new wave of sub-urbanization**, which will require new approaches in regional and infrastructure planning.

## Why is rural development an interesting research topic?

Problems in agriculture, such as BSE, the recent epidemic of Foot and Mouth Disease or the various food scandals, have heightened public interest towards the rural world, but experts have argued for years that greater attention should be paid to Europe's countryside. There are mainly four reasons, why we believe rural development is an interesting research topic:

1. Many rural areas are in a **deep structural crisis**. The traditional economic basis - agriculture and forestry - is threatened by international competition, stagnating or changing consumer demand, and increasing concentration and rationalization of production units. As a consequence, labor opportunities have deteriorated and the human resource base is weakened by massive out-migration of young people. Declining fertility contributed to the extreme trends of population aging in many parts of rural Europe.
2. So far, politicians both on the national level and in the European Union, have responded to this lingering crisis primarily with agricultural policies that were focused on production subsidies. However, these subsidies have often concealed the structural problems instead of facilitating adaptation. With Agenda 2000 the European Union made a first step to reform the Common Agricultural Policy (CAP) and focus more on integrated rural development. It is obvious, however, that **political decision makers are looking for scientific advice** on how to deal with the emerging structural crises in Europe's rural areas (in particular, how to deal with the problem of depopulation).
3. Rural development is also interesting for researchers because there are **new technical and scientific trends**, which could deeply affect rural areas in the future. It will be most interesting to see how the new possibilities in biotechnology and molecular biology will affect agriculture and

Table 1: Population age 65+ in % of total population, 1997; Farmers age 65+ in % of all farmers, 1995

	Age group 65+		
	Total population	Farmers	Difference
Germany	15.9	7.0	-8.9
Finland	14.2	7.0	-7.2
Austria	15.7	9.0	-6.7
France	15.9	15.0	-0.9
Belgium	16.7	17.0	0.3
The Netherlands	13.1	15.0	1.9
Luxembourg	14.3	17.0	2.7
Sweden	17.8	21.0	3.2
United Kingdom	16.0	20.0	4.0
Denmark	14.9	22.0	7.1
Ireland	11.5	20.0	8.5
European Union (15)	15.8	26.0	10.2
Spain	15.4	26.0	10.6
Greece	16.5	31.0	14.5
Italy	17.1	36.0	18.9
Portugal	14.8	35.0	20.2

In Portugal, Italy, and Greece more than 30% of the farmers are older than 65 years; by comparison only between 14% and 17% of the overall population in these countries is 65 years and over. Surprisingly, the percentage of all farm managers in Germany, Finland, and Austria who are age 65 and over is lower than in the population! Again, this illustrates the great diversity of demographic conditions in the rural areas of Europe.

Figure 1: Percent of gross value added by agriculture

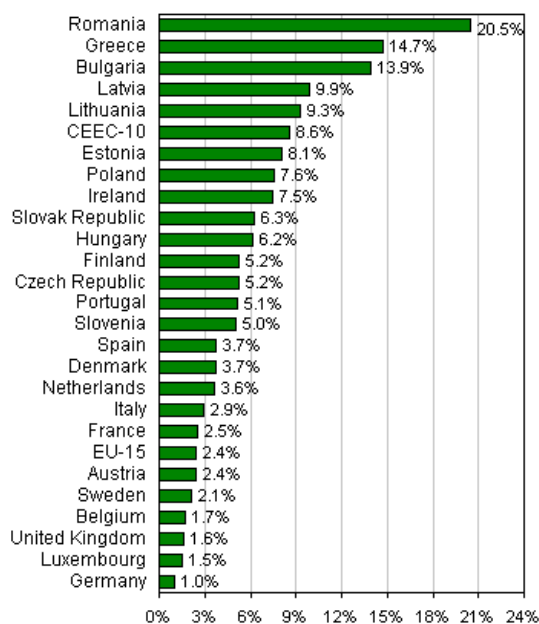
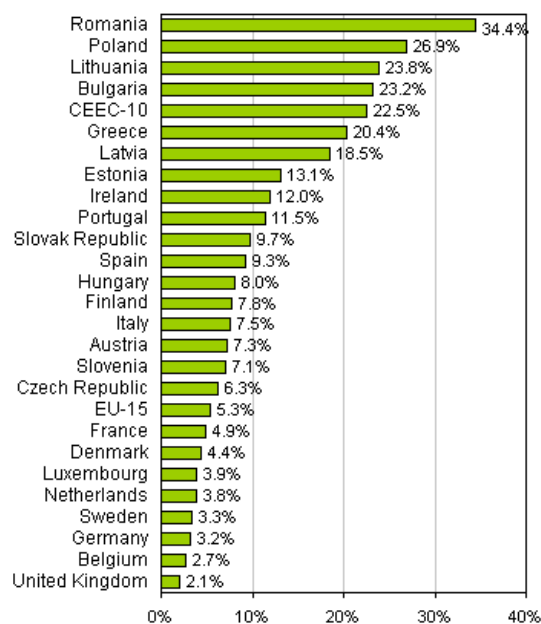


Figure 2: Percent of employment in agriculture



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livestock production. The expansion of the Internet could also bring new businesses to the countryside and improve deteriorating rural services, such as banking.

4. The **expected EU enlargement** will generate special problems, but perhaps also opportunities to the rural areas of the accession countries - particularly to Poland which still has a large agricultural population. The expansion will also require a reform of the EU subsidy policy - a topic where scientific expertise will be required to develop new distribution schemes which are both rational and fair.

## Scientific challenge

We believe that political decision makers will be interested in the results of a IIASA project on Europe's rural development. Facing the problems of EU-expansion and the difficulties in agricultural restructuring, they are obviously looking for ideas and concepts of how to deal with the mounting problems in rural areas. But we also believe that the new IIASA project on rural development is interesting from a purely *scientific* perspective:

1. The project requires **genuine inter-disciplinary research**, which includes both natural and social sciences. It is clear that the development of rural areas involves multiple dimensions - from the bio-geophysical resource base to the demographic structures and the economic and political condition. It is a scientific challenge to integrate these rather diverse dimensions into a coherent analysis.
2. The project also strives to improve **spatially explicit (geo-coded) information** on Europe's rural areas that are used in many other fields of research. We are developing an *integrated* and *homogenized* GIS database with detailed bio-physical, demographic and socio-economic information at the NUTS 3 level (see map 1). This information is currently not available to the research community in an *integrated* database, only as separate national and sectorial data sets. The project will also undertake **spatial analyses**, that combine geo-biophysical, economic, demographic, and socio-cultural variables - a field of research that is rather undeveloped.
3. A major objective of the ERD project is to provide decision support for politicians and the interested public. We plan to develop **innovative decision support tools**, which can be used directly over the Internet. In particular, we have already started to develop a **spatially explicit model** for the identification of optimal development strategies (the **Rural Analysis and Planning Model**). This **RAPS** model will use an integrated database of bio-physical, economic, demographic and political indicators.

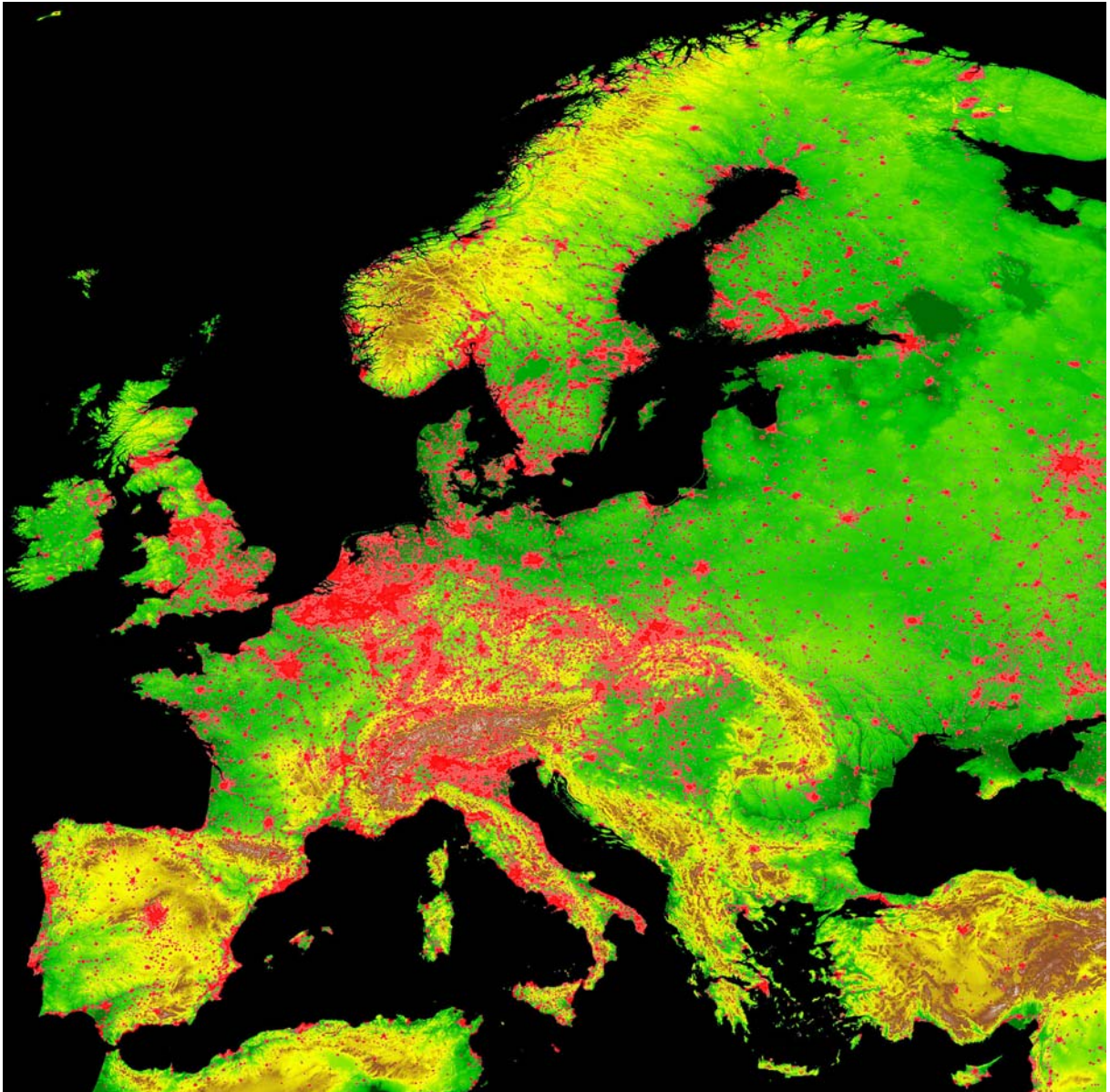
## Basic concepts

The research project on European Rural Development makes three fundamental assumptions:

First, we assume that a scientifically sound and politically *relevant* analysis of rural development in Europe is only possible, if we *simultaneously* take into account all relevant dimensions of rural life. Rural development is a *multi-sector* process, which not only includes economic change, but also requires adaptation in human behavior and social structure. Moreover, rural development can be only sustainable, if it is adapted to the bio-physical conditions and resources of the regions. We also have to take into account the process of political participation, which must be part of every

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Map 1: Europe's population distribution as estimated by stable night lights



**Sources:** Images used with permission from CEOS GLOBE Task Team, World Data Center - A, National Geophysical Data Center (Head: David Hastings)

**Note:** This map is a combination of two maps: (1) a Global Land One-km Base Elevation (GLOBE) map with topographic color and shaded elevation relief with bathymetry from Smith and Sandwell; and (2) a map of stable lights (cities, villages, gas flares, etc.) from the Defense Meteorological Satellite Program. The colors from the original map images were edited for greater visual clarity. Please note that these are 2nd generation images of stable night lights, which allow distinction of artificial lights, gas flaring, and forest fires.

As we can see from this map of stable night lights, Europe's population is highly concentrated along the coastlines and in a corridor reaching from the Netherlands down the Rhine valley to northern Italy (see the red areas). There are very large rural areas of thinly populated space in Norway, Sweden and Finland and some parts of Spain. This very uneven population distribution is a reason for great concern, especially among the Nordic countries.

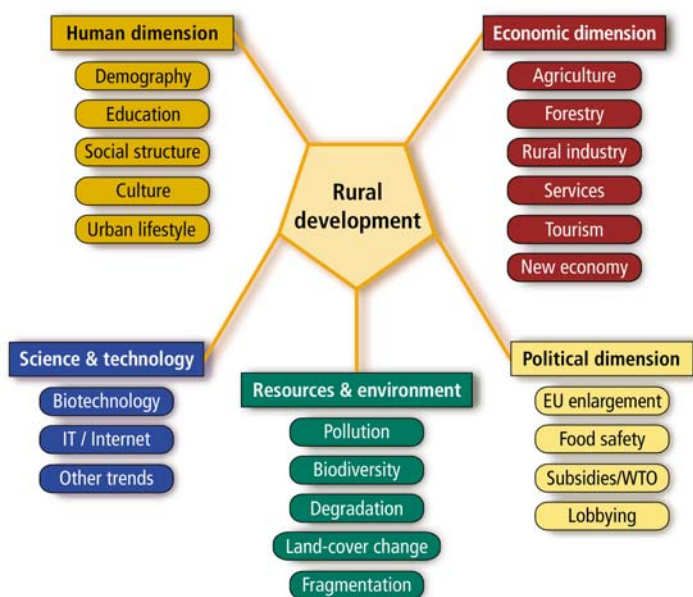
We plan to use the stable night light remote sensing data (in collaboration with the IIASA TNT project) for innovative *spatial* analyses. For instance, we will study relationships between population density and regional energy consumption, regional GDP, or infrastructure development.

rural development policy. Finally, we assume that rural areas in Europe may change significantly due to technological innovation, such as growing application of bio-technology or the Internet. We have therefore decided to distinguish five dimensions of rural development (see figure 3):

**Human Dimension:** The basis of all rural development are people. If a rural area has massive out-migration of young people or if a large percentage of the farmers is above the age of 65 (as is the case in Italy, Greece, or Portugal), it will be very difficult to initiate endogenous economic growth (see table 1). The human dimension also includes the educational level of the population, their cultural identity and their social structure. Human factors are not only relevant in the rural areas: we also have to consider the impact of *urban* life-style change on rural areas, such as changes in leisure activities or food consumption of the urban majority.

**Economic Dimension:** Many languages have sayings which point out that for ordinary men (and women) the economic sphere of life comes first and foremost. Societies cannot indefinitely afford to subsidize living conditions only for reasons such as “landscape preservation” or “cultural heritage”. In the end, if there is no *viable* economic basis for rural life, there will be no rural life. Many experts are concerned that policies for improving or at least stabilizing the economic situation in rural areas have not worked too well in the past. For most farmers, the economic situation has *deteriorated*, despite heavy subsidies from both national and Community sources. While the European Union has reduced in the past 30 years their agricultural spending from about 80% to less than 50% of Community Expenditures (see figure 4), the total amount of agricultural subsidies is still very high in comparison to other economic sectors. This has great political relevance, because agriculture and forestry are often *not* the most important economic activities in rural areas. The agricultural part of the GDP is less than 3% in most EU countries (see figure 1). There are *rural* regions in Europe where agriculture and forestry play a minor role or are almost irrelevant for the income of the population. Austrian tourist “villages” in the Alpine mountains are a case in point. But even under ordinary conditions other sectors than agriculture and forestry are becoming increasingly important, such as rural industry or rural services.

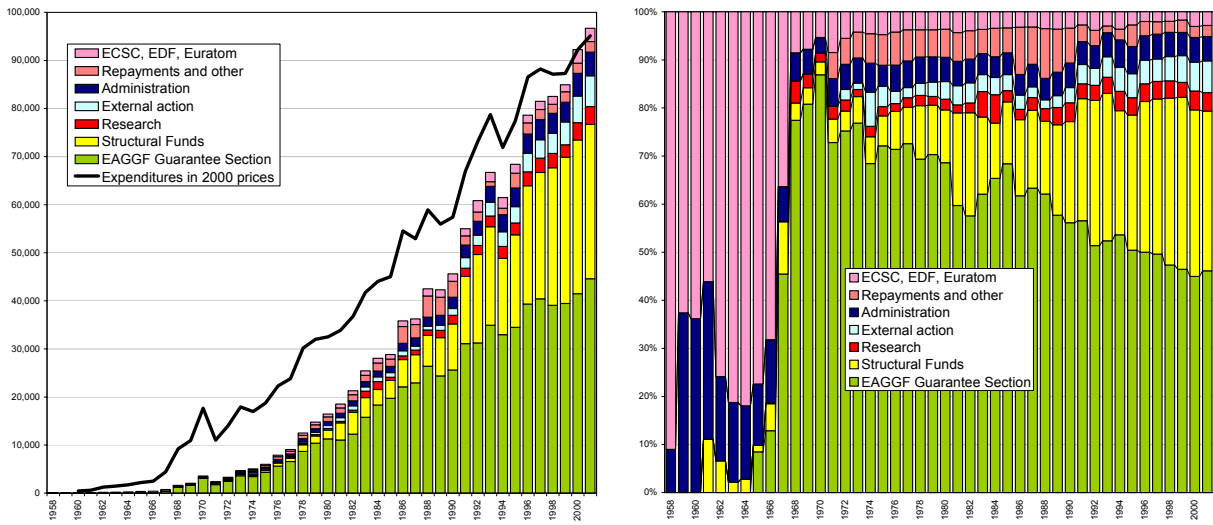
Figure 3: Dimensions of rural development



In recent years there have been also economic developments in rural areas that could be summarized under the term “new economy”. These include not only facilities and services of the IT industry, but also bio-technology firms. The “new economy” is sometimes combined with traditional production and tourism, such as in the direct marketing projects on the Internet for organically produced agricultural products (see for instance: “Culinarium Austria” or “Styria Beef”)

**Environment & Resources:** In the long run, rural development is only possible, if it does not waste essential natural resources (such as water), if it

Figure 4: EU Community Expenditures (“Outturn in Payments”) by budget section (in million Euro and in %)



preserves the cultural landscape, if it does not pollute soils, water and air, and if it safeguards the biological diversity of plants and animals. Other than in cities, where we can live and work in a highly artificial environment, the rural areas depend to a much greater extent on *natural* resources and a healthy natural environment for many of their economic activities, such as tourism, food production, or forestry. Every new policy measure for the promotion of rural development has to be evaluated in its impact on the natural environment. New economic and political concepts have to be developed and implemented to promote the preservation of biodiversity, such as the introduction of ecological criteria in agricultural subsidies.

**Political Dimension:** Public opinion and the participation of various social and economic groups in the political debate about development priorities are most important for rural change. There can be no doubt that farmers’ protests and massive lobbying of the food industry have in past years significantly affected Europe’s agricultural policies - both on the national and EU level. Rural development scenarios therefore cannot be based solely on objective bio-physical conditions or economic rationality - they must also take into account political pressures; and this clearly requires analyses of the power balance between various political actors of rural development.

Another political question of great relevance to rural areas is the expansion of the European Union. Some of the likely accession countries have still relatively large agricultural populations - especially Poland. Their rural economy will significantly depend on policies that will be decided during ongoing negotiations with the European Union.

Finally, it is also a *political* question of how - and to what extent - European Agriculture can be (or should be) protected from international competition. The WTO negotiations are therefore certainly a factor of European rural development.

**Science & Technology:** Today, *every* sector in a modern society is affected by the breathtaking development in science and technology. The rural areas are no exception. For instance, we must study the likely impact of modern bio-technology on agriculture, livestock production and in the food industry, if we want to gain insight into the rural development process. Important questions in this study will be which new technologies might have a particular strong impact on

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*rural* development. We already can see the changes that modern information technology has triggered in some sectors of the rural economy, such as in direct marketing and tourism, where they seem to open-up new possibilities for economic development. We have to analyze whether these trends are likely to progress and what other sectors of rural life might be affected. For instance, we believe that rural areas in the fringe of big cities will see a new sub-urbanization due to an increase in tele-commuting.

These five dimensions are also reflected in the Europe-wide databases on rural development that are part of the ERD web site (see figure 5). They will also be incorporated in the RAPS decision support system, which we plan to develop later in the project (see figure 6).

The second principal assumption for the IIASA project on Rural Development is that we believe in the necessity of a Europe-wide comparative perspective. Rural development will be increasingly affected by political and economic decisions of the European Community. We also assume that global trends will have *more* impact than in the past.

**A Europe-wide, comparative perspective:** The IIASA Core Group will focus on *Europe-wide*, comparative analyses of rural development - dealing with all five dimensions mentioned above. IIASA has a comparative advantage for this type of research due to its extended network of collaborators and its multi-disciplinary approach. The assumption that Europe-wide factors will get more important also reflects the expected expansion of the European Union. Large rural areas in Eastern and Central Europe will come under the influence of Community legislation and agricultural policy.

**The globalization impact:** Special attention is given to the impact of global trends on European rural development. The WTO process is likely to increase pressure on Europe's agriculture. But there are other relevant trends of globalization. For instance, information technology might lead to an expansion of markets for certain products and services from rural areas - such as in tourism and high-value food products.

The third basic assumption of the ERD project is that we can only provide scientific support for decision makers, planners and other key-players, if we take into account the *dynamics* of rural development. We must distinguish at least four phases of (rural) development, which are repeated - sometimes multiple times - in a *cyclic* process (see figure 5). These phases, and the typical questions which they must solve, are:

- (1) **The diagnostic phase dominated by analyses:** What is the current situation?
- (2) **A phase dominated by policy:** Who are the main actors and what do they want?
- (3) **The modeling or planning phase:** Which developments are possible?
- (4) **A phase of implementation:** Which measures should be used?

A development cycle begins when someone (usually a *group* of people) has an economic, social, demographic, political, or environmental problem or when someone sees a chance to improve current conditions. This initiative can come from (ordinary) people living in rural areas (bottom-up approach) or from planners and decision makers (top-down approach). The most important task at this stage is to **clearly identify and describe the problem or opportunity**. Scientists can help at this stage by *systematically* analyzing (with empirical methods) the causes of current problems and opportunities, such as changes in technology, economic

conditions, or other driving factors. Scientists sometimes believe that after having identified a problem or an opportunity they can immediately start elaborating development strategies, models and scenarios. This “technocratic” approach, however, cannot work in a free society, because various actors will usually disagree on the development *objectives*. Farmers, environmental activists, food industry managers, owners of hotels and tourist facilities, rural business owners, or local politicians will typically have different values and interests.

A **political negotiation process** in which all relevant actors can participate is therefore a key element in every development cycle. Scientists do *not* have a special role in this political process.

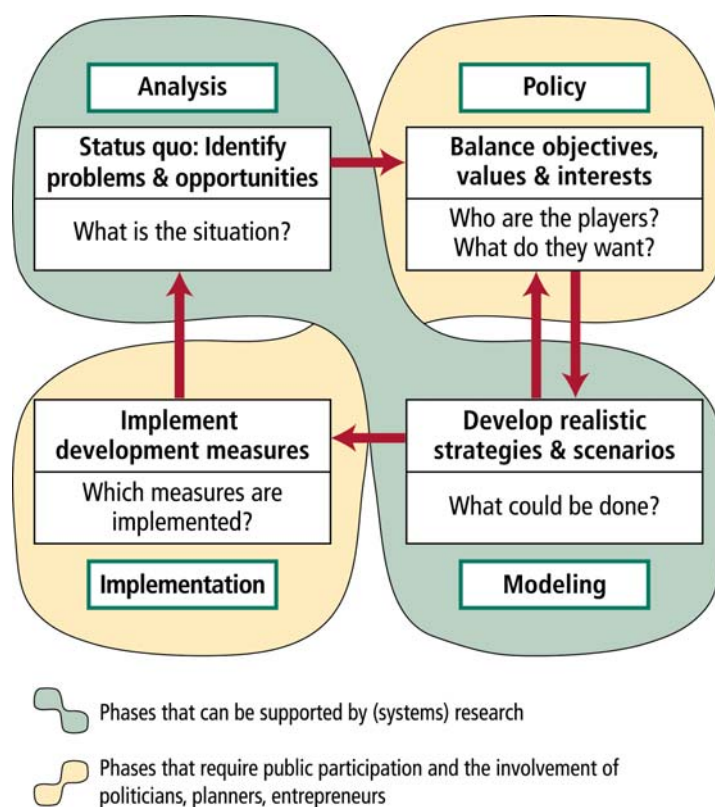
When it comes to making political decisions and balancing divergent interests, scientists have the same status as everyone else - they are just one of the parties with *their own* special interests.

The political process of defining development targets is extremely difficult - if not impossible - when the major actors have only rather general ideas, values or preferences. Consensus-building is much easier with clearly defined development strategies or scenarios. A rational political discussion is more likely, when the political opponents can decide between a small number of **realistic development alternatives**. This is where scientists can help. They can develop models or scenarios based on different development priorities. Usually, a development process has to pass through a period where phases of political negotiation and development of new scenarios alternate several times.

The fourth stage in a typical development cycle is dominated by planners and implementers. At this stage the main task is to **identify and implement specific measures**, which will bring about those changes that a majority of the “players” want to achieve. This requires not only technical experts in fields such as finance, administration, and controlling (for instance for the administration of subsidy schemes). In a market economy it is also necessary at this stage that *entrepreneurs* take over and actually start new businesses (of course, these entrepreneurs can also be farmers, who start new types of integrated production or marketing). We emphasize the essential role of entrepreneurs, because the idea that rural development can be promoted by an administration implementing infrastructure projects or distributing subsidies is an ideological heritage of a planned economy, which is the opposite of intrinsic development.

These four stages can be found in all kinds of development processes - in economic or social devel-

Figure 5: A development cycle



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opment as well as in demographic or cultural change. They can also be found at different levels - from the initiative of an individual to the programs of a national or international development agency. And they are typically repeated many times to fine-tune a development process. The light-green area in the diagram indicates the two stages where (systems) research can contribute most to the development process.

## Rural development and conflict resolution

We have argued above that rural development typically involves *many* (economic) sectors and is driven by *multiple* human *actors*. A scientific approach for analyzing rural development must therefore take into account conflict. Usually, there are conflicts between various sectors of development, such as between agriculture and tourism or between rural industrialization and environmental protection. For instance, it would be difficult to develop rural tourism in an area where the landscape was already demolished by open pit mining. Large-scale intensive farming is often in conflict with groundwater protection schemes or programs to increase biodiversity. There may be also a conflict between available human resources and development policies. For instance, we may find ambitious economic programs for promoting rural innovation in areas where the population mainly consists of farmers at retirement age and where markets are extremely small due to low population density. There may be also conflicts between the level of education and ideas for rural high-tech development, such as in schemes to develop a rural IT sector.

However, there is usually an even deeper reason for conflict in a development process: the *inevitable* divergence of interests, values, and objectives *among the various groups involved*. Even if there is no discrepancy between the various *sectors* of development, conflicts are inevitable, because human actors usually disagree due to their social and economic position or their personal preferences.

Since rural development is essentially a social process, driven by (groups of) human actors, we have to study, how these diverse groups handle and resolve their conflicts of interest. To make it very clear: development research, that does *not* include the analysis of conflict mediation and resolution between different groups is un-scientific, because it ignores essential elements of the process to be studied. The ERD project will therefore seek collaboration with the IIASA PIN project to study the conflict aspects of rural development. The “Processes of International Negotiation Network (PIN)” has analyzed various international negotiation processes, that are highly relevant to rural development, such as negotiations in the WTO or negotiations concerning the expansion of the European Union.

In particular, we are interested in the following questions:

1. What are the typical conflicts that can be observed in rural development?
2. Which (social, economic, or political) groups are driving these conflicts?
3. What (social, political, economic, or legal) mechanisms are used to mediate these conflicts?
4. Can we recommend tools or mechanisms that would help to resolve development conflicts?

The last question is of particular relevance. Rural (or regional) development is often stalled or even blocked completely, because various groups involved cannot agree on development objectives and

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measures. We have seen this with infrastructure projects, such as roads, railways, or water reservoirs, but also with nature parks or the development of rural tourist facilities. Most obviously, farmers have often expressed their interests with rather drastic actions in order to block certain agricultural reforms (in particular concerning the system of subsidies from the European Union). In recent years, environmentalists have promoted the idea of sustainable (rural) development. It is obvious, that their concepts often clash with the (economic) interests of local populations. It is not our intention to take sides in these debates, but we must identify the conflict partners and analyze their divergent objectives. Otherwise, our research would be irrelevant for political decision makers and planners, who have to deal with the rural world in all its complexity.

## Longer-term objectives of the ERD project

The longer-term objectives of the ERD project are as follows:

1. **Analyze the underlying driving forces** of current problems and opportunities in the rural areas of Europe by applying an integrative and truly multi-disciplinary framework. In particular, the project intends to analyze (in cooperation with Polish, Czech and Hungarian partner institutions) the rural development problems and opportunities in the EU accession countries. These analyses will be based on a Europe-wide spatial GIS database, for which we will homogenize and integrate geo-biophysical, economic, and socio-demographic data sets.
2. **Assist decision makers and planners** by developing software tools, models and databases for analyzing current conditions in rural areas.
3. **Initiate new visions for rural development in Europe** by developing innovative scenarios, which give special emphasis to development options *outside* the traditional sectors of agriculture and forestry. For this task we will conduct some 30 to 40 case studies of rural development projects in various European countries.
4. **Promote international cooperation** in rural development research through the establishment of a network of research groups.
5. **Become the leading Internet web site** for Rural Development Research in Europe. The ERD web site will be a highly interactive, content-rich platform for the exchange of research ideas and results and a generally available depository of development-related databases and models. The web site will also become a model for innovative electronic publishing of data, analyses and models.

In general, the ERD project anticipates a four-year work schedule, with the concept development, data collection, and establishment of a research network in the first year; analyses and model building in the second year; applications development, and policy consulting in the third year; and scientific publications in peer-reviewed journals in the fourth year.

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## Major research tasks of the IIASA Core Group

The work of the ERD Core Group at IIASA will include the following tasks:

1. **Europe-wide comparative analyses** of underlying driving factors of rural development, such as major demographic trends, changes in (agricultural) policy, impacts of technological innovation, changes in consumer preferences, land-cover and land-use changes, etc. These analyses will use spatially explicit databases, including various digital maps, but also *regionalized* socio-economic and demographic indicators.
2. The great regional and local diversity of natural, economic, demographic, social and political conditions in Europe's rural areas makes it very difficult to identify general development trends and underlying factors. We will therefore undertake a series of 30 to 40 **case studies** of rural development projects in various European countries. These case studies will cover a wide range of development types - from conventional agricultural modernization to new types of high-tech Internet businesses. The task is to identify *innovative ideas* for rural development.
3. At a later stage in the project the results of the comparative analyses (and in particular the spatial databases developed for these analyses) and the case study results will be used to design, implement, test, and deploy a (web-based) tool for decision support. In particular we will develop a *rule-based* **Rural Development Model**.

## Relationship between project components

The ERD project will include both Europe-wide **comparative analyses on the macro-scale** (with NUTS3-level areas as the units of analysis but EU-wide coverage, including accession countries and European IIASA member countries) and a series of **case studies on the micro-level** (of individual project areas or municipalities). Both will be conducted by the ERD **Core Group** at IIASA. The purpose of this two-level approach is to combine very detailed *qualitative* studies of certain types of rural development projects with *quantitative* analysis of general trends on the aggregate level.

We hope that these activities of the IIASA Core Group will be complemented by research projects of our collaborators. These projects will be either ongoing research activities that already fit into the overall concept of the ERD project; or the collaborators will start new activities in coordination and collaboration with the IIASA Core Group. The activities of the collaborators will typically be more *focused* - either on a specific region, or on a specific sector of development; or they will be more disciplinary in orientation. The **Focus Groups** will concentrate more on *analytical depth*, while the Core Group will try to *synthesize* the various results into a coherent overall model of rural development in Europe. The Focus Groups will decide themselves which particular method or concept they would use, as long as it fits into the overall ERD framework. We cannot expect that researchers from many disciplines and research traditions would use *one* particular methodology or model.

Joint publications will include results from both the IIASA Core Group and the Focus Groups.

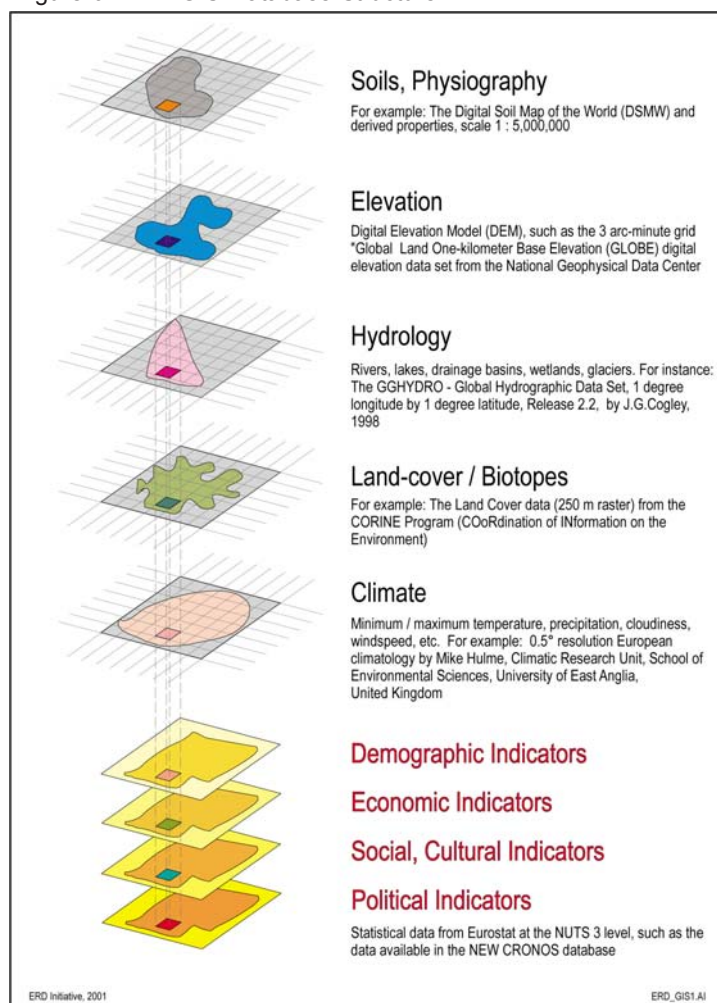
## Methods and techniques

It was confirmed during all our preparatory discussions with colleagues and political experts in the field of rural development that it is essential to study rural development in a *multi-dimensional* framework. As was outlined above, we consider at least five dimensions as relevant: The human dimension (particularly the demographics), the economic dimension, the resources and environment, the political dimension, and the impact of science and technology. In our view, this requires a multi-disciplinary approach **and multiple methods** for analysis and modeling. The ERD Core Group plans to use the following methods and techniques:

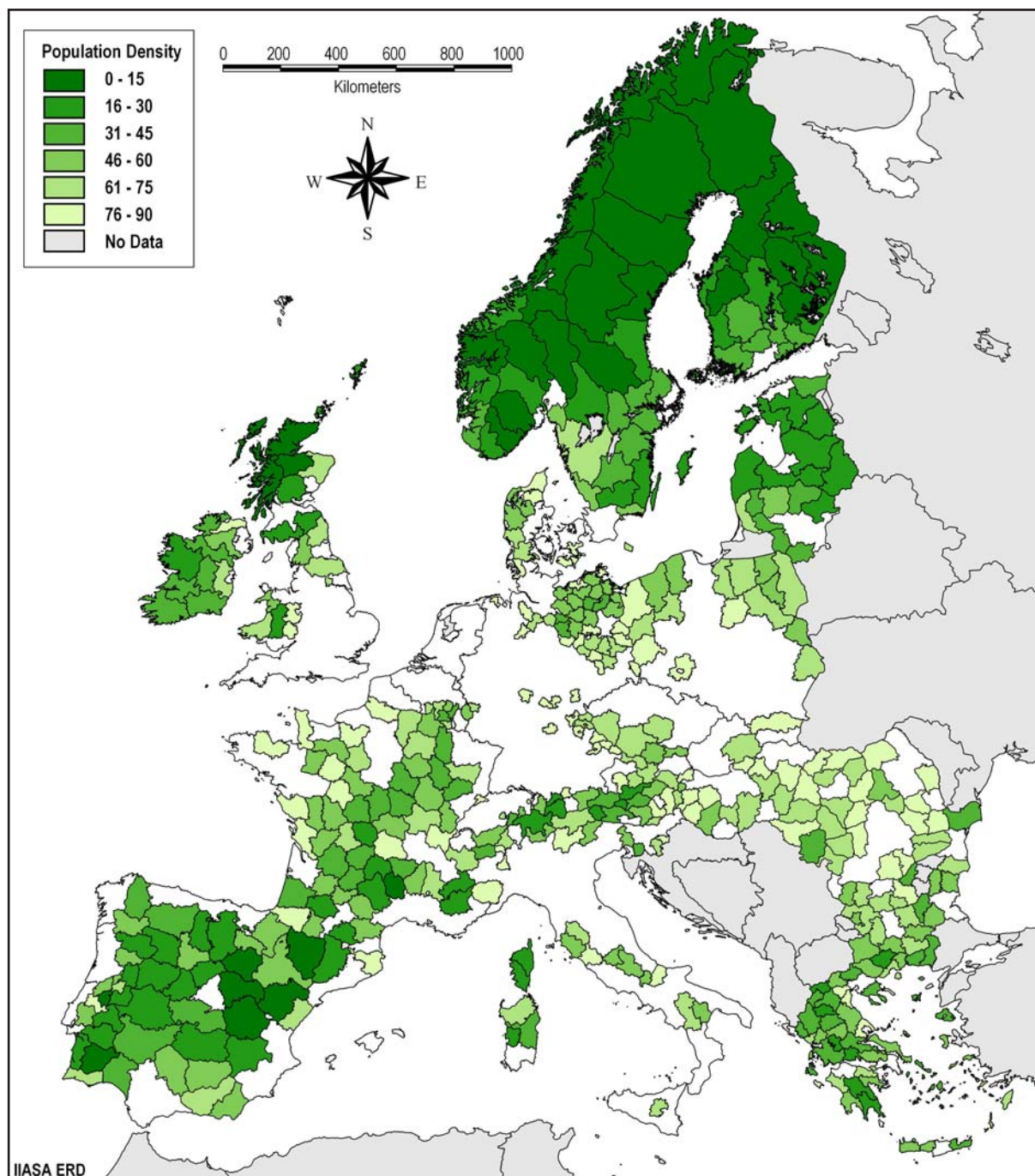
1. Important human dimensions in the rural development of Europe are the demographic structures and trends. We will use **cohort-component population projections** (possibly in a *multi-state* version) for analyzing rural and urban population trends in all European countries between 1950 and 2050. In its Population Project (POP) IIASA has a long tradition of developing and using these types of population projection models. The method will be applied to calculate urban-rural population projections for all ERD study countries. If possible, these projections will be regionalized on the NUTS 2 level. This would be the *first time* urban-rural population projections would be undertaken on a *regional* level for all of Europe. The results would be of great relevance not only for analyzing rural development, but also for regional planning.

2. **GIS-based spatial analyses** (with ArcInfo / ArcView) will be used for mapping and modeling geo-referenced data. This should be particularly useful for studying how the physical and biological environment interacts with rural development in Europe (see figure 6). In the Land-Use Change Project (LUC) and the Forestry Project (FOR) IIASA has many years of experience in GIS-based analyses. The ChinaFood CD-ROM also used GIS mapping and analysis techniques. Spatial correlation techniques will be used to uncover relationships between various spatial indicators, such as population density, regional GDP, accessibility (remoteness index), regional unemployment, etc. Example 1, 2, and 3 are maps that were produced with the ERD GIS. For a short description of the maps see the text below the examples.

Figure 6: ERD GIS Database Structure



## GIS Example 1: Sparsely populated areas in Europe (persons per square-kilometer)

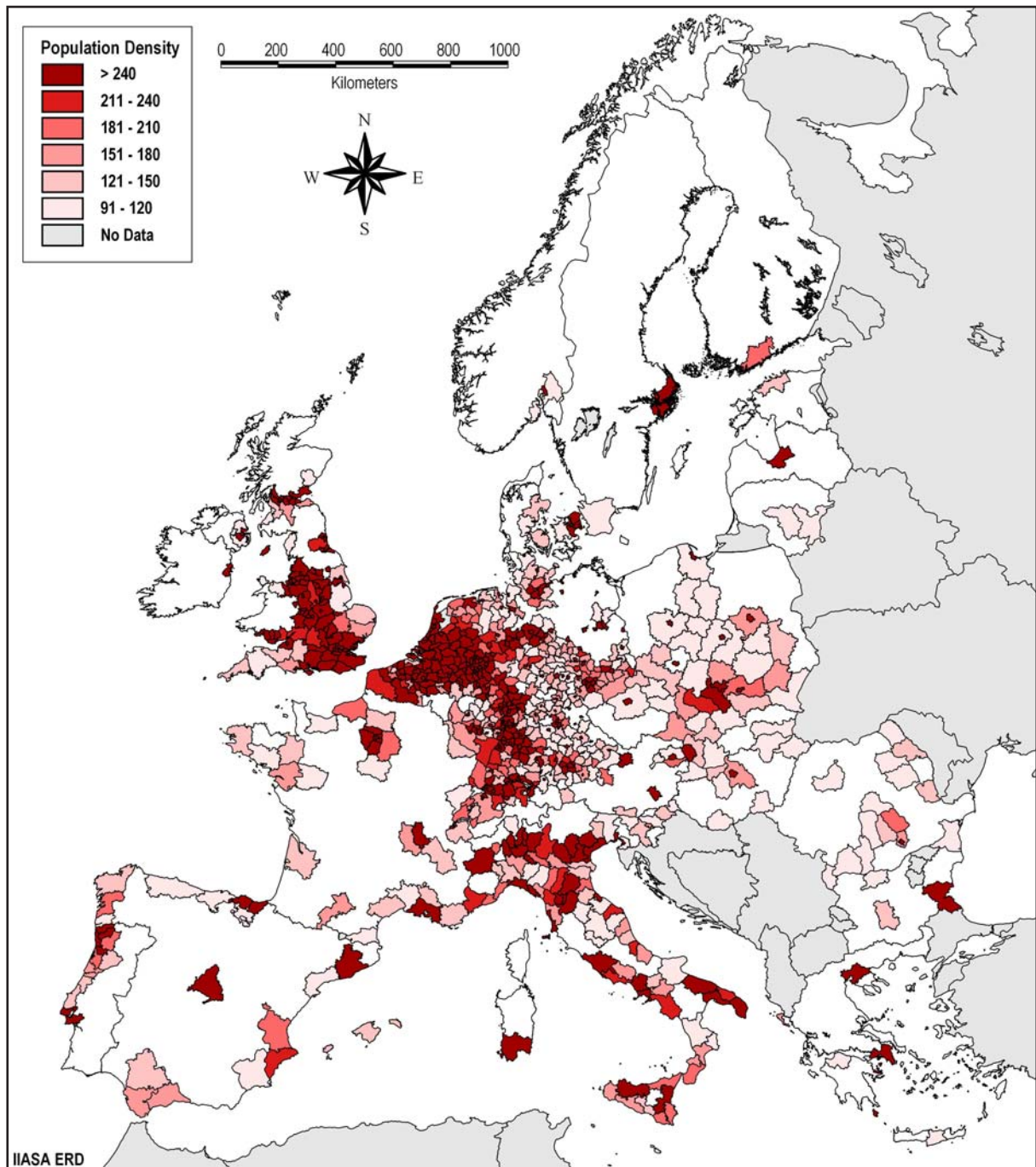


**Sources:** CISCO boundary files; REGIO database from EUROSTAT; latest statistical yearbooks.

**Note:** This map includes 1315 areas (NUTS 3 level or equivalent). **ERD map code:** 3d\_2\_450.jpg

This map is an example of the ERD GIS system. It displays only areas with low or **very low population density** in Europe. Most parts of Norway, Sweden, Finland, the Baltics, Northern Scotland and Central Spain have population densities of below 30 inhabitants per square kilometer. Areas with such a low population density can be certainly classified as predominantly rural. Low population density of under 60 inhabitants per square kilometer can be also found in large parts of Ireland, Central and Southern France, Eastern Germany, Northern and North-eastern Poland, the Southern part of the Czech Republic, Slovakia, Hungary, Austria, Bulgaria, the Western part of Romania, and Greece.

## GIS Example 2: Densely populated areas in Europe (persons per square-kilometer)

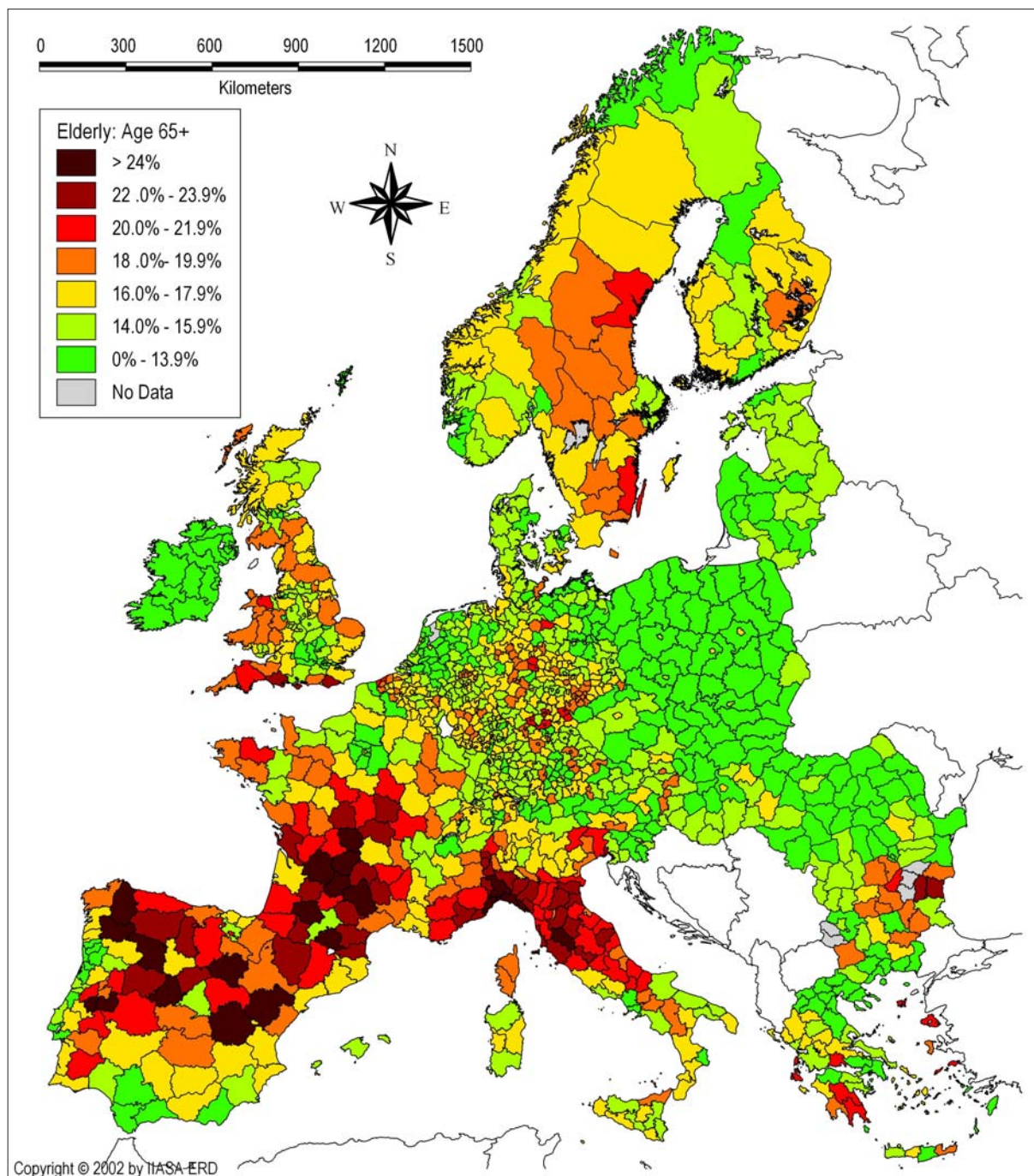


Sources: CISCO boundary files; REGIO database from EUROSTAT; latest statistical yearbooks.

Note: This map includes 1315 areas (NUTS 3 level or equivalent). ERD map code: 3d\_2\_450.jpg

This map displays only areas with a high or very high population density in Europe. There is a clearly visible corridor of densely populated areas that includes Central and Southeastern parts of the United Kingdom, all of the Netherlands, most of Belgium, areas in Western Germany and France along the Rhine valley, Switzerland and Northern Italy. In addition to the main capital areas around Stockholm, Helsinki, Copenhagen, Paris, Berlin, Madrid, Athens, and Rome there are also patches of densely populated zones along the coasts of Spain, Portugal, and Italy. These areas have a population density of at least 90 inhabitants per square kilometer, sometimes much higher. They can be classified as predominantly urban.

### GIS Example 3: Population aging in Europe - Percentage of elderly (age 65+)

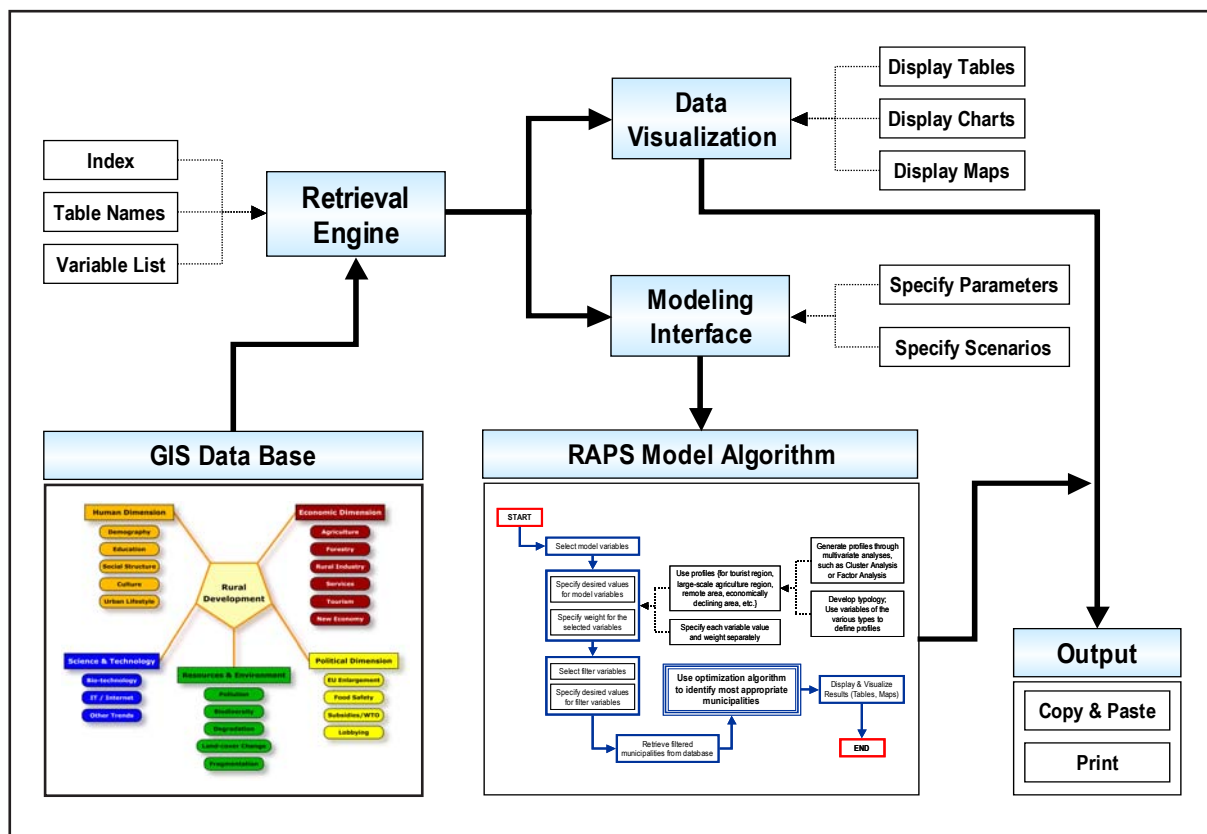


**Sources:** CISCO boundary files; Latest statistical yearbooks; Personal communication with various Statistical Bureaus and Census Offices.  
**Note:** This map includes 1315 areas (NUTS 3 level or equivalent). ERD map code: 3d\_2\_450.jpg

This map displays percentages of elderly aged 65+ in Europe *at the NUTS 3 level*. Since these data were not available from EUROSTAT, we had to compile them by contacting more than 25 Statistical Offices in European countries. These data indicate a very strong aging of the population in Southern France, North-central Spain and Northern Italy. In some of these areas, more than 25 percent of the population are age 65 or older.

3. IIASA researchers have been developing **decision support tools and systems** for many years - from mathematical optimization models to expert-based scenario projections. In the ERD project we will, at a later stage, also develop a (Web-based) decision support tool, which should help to

Figure 7: Basic algorithm for a Rural Analysis and Planning System (RAPS)



organize and communicate our research results on rural development to political decision makers and planners. Other than integrated numerical models, this tool has to combine *qualitative* and *quantitative* information from many sectors, such as results from demographic projections, environment characteristics, economic conditions, political scenarios and technological trends. The specific type of model that can synthesize these different aspects into a coherent tool for decision support cannot be determined now. It will depend on the results of the sectorial analyses. However, at the moment we believe that a *rule-based decision support tool*, will be most appropriate for this purpose. We have developed a first prototype of such a system, which combines indicators from all five dimensions to determine optimal development strategies and measures for a specific region (for an outline of the algorithm see figure 7). In essence, the model weighs multiple criteria according to pre-selected scenarios, to rank the regions by their development potential. The model would be a great improvement for current techniques of designating regions for certain EU funding programs (such as the Objective 1 regions). These techniques typically use rather simple indicators, such as population density or regional GDP.

We do not believe in a unified “general” systems theory or (mathematical) model that would explain *all* dimensions of rural development. We prefer a **multi-method modeling approach**, where only

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the *results* of sector-specific analyses and models are combined into an overall synthesis (“loose” linking of models).

For the Case Studies we are applying standard interview techniques (with formal questionnaire) and direct *structured* observation. In addition low-level administrative statistics are being collected for the municipality and the region, in which the development project is located. These local data include environmental, demographic, economic and socio-political indicators. A working paper with a first set of 9 case studies was published recently.

## **Anticipated Output / Products**

In addition to internal working papers, the ERD project will produce the following:

- a) Papers for peer-reviewed scientific journals. These publications will be used to disseminate research results from sector-specific studies (i.e. population aging, the potential of bio-fuels, the non-agricultural rural economy, etc.) to the scientific community.
- b) An interactive Web page and CD-ROM, with a synthesis of our analyses on rural development in Europe. This product will also make all databases and other materials of the project available. Target audience is the interested public. The development of databases and web pages is currently under way.
- c) A decision support software (on CD-ROM) for political decision makers and planners, which will serve as an interface between our research results and materials and political experts and decision makers. This Rural Analysis and Development System (RAPS) will allow the users to select certain scenarios of rural development and let the model identify those areas with the highest (lowest) development potential, based on a multi-criteria optimization. The RAPS system is currently in its conceptual phase. A first prototype will be published as soon as the compilation of databases, which are required for the model, is completed. We anticipate that this will be the case in late 2003.

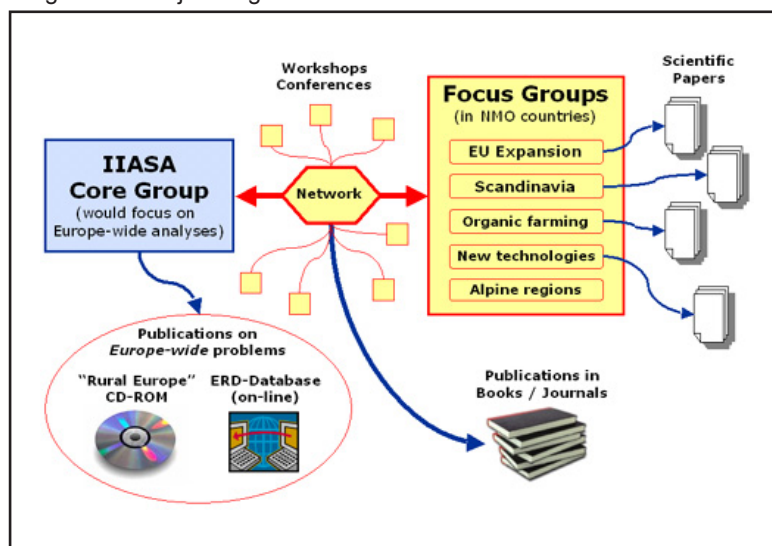
## Organization of the ERD project

The diversity of problems and the great regional variation in European rural development requires a project organization, which gives special emphasis to collaboration with researchers in the various countries. The ERD project therefore consists of three elements:

1. A **IIASA Core Group**.
2. Several collaborating **Focus Groups** located in IIASA NMO countries.
3. A process of **network activities**, such as regular workshops or conferences, where all participants of the project, and also external researchers, will come together, exchange results and coordinate joint publications.

The Core Group at IIASA not only coordinates and supports the research activities of the collaborating Focus Groups, but also conducts substantial *in-house research* and thus contributes the specific IIASA experience in (global) modeling and systems analysis. The main tasks of the IIASA Core Group are (1) Europe-wide comparative analyses on the basis of spatially explicit databases (GIS analyses); (2) a series of case studies of *innovative* rural development initiatives in various European countries; and (3) the development of decision support tools and models.

Diagram 1: Project organization



The Focus Groups are organized on a geographical or a thematic basis. For instance, one Focus Group deals with rural development in the EU accession countries (particularly Poland, Czech Republic, Hungary); another group might focus on the impact of new information technology (Internet) on rural development, a third one could focus on the Alpine region (see diagram 1). One important reason for formally connecting Focus Groups in various IIASA member countries to the ERD project is the intention of submitting joint research proposals to the 6th EU Framework Program (see results of the ERD workshop in Warsaw). We plan to organize important parts of the ERD project as a *multi-national activity*. This approach is also reflected in the ERD network activities, which should develop into a platform for European rural development research - coordinated, supported, and moderated by IIASA. We will be organizing regular workshops on European rural development with participation of policy makers, similar to the highly successful International Energy Workshop.

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## Collaborators

An important element of the ERD project is to organize a Europe-wide network of researchers interested in rural development. We are therefore establishing (regional) Focus Groups of interested collaborators. We are already collaborating with an Austrian ERD Focus Group (see list of participants) and are in the process of intensifying our contacts with researchers in Scandinavia and the EU accession countries in Central and Eastern Europe (Poland, Czech Republic, Slovak Republic, Hungary). Currently, the ERD project is collaborating with following researchers or Institutions (please note that this list is not complete due to ongoing discussions on collaboration):

1. Dr. Vihriälä and Dr. Volk from the Pellervo Institute in Finland have indicated interest in collaborating with the IIASA ERD Core Group on the development of (economic) indicators on rural development. They are interested in indicator systems, which use *multiple* criteria to identify the competitiveness of rural regions. Their research shows that competitiveness is not only an economic question, but must also include human and infrastructure factors. This approach is quite similar to our multi-dimensional concept of rural development. We see a possibility for collaboration in the collection and GIS analysis of spatial development indicators. Dr. Vihriälä, the Director of the Pellervo Institute, has also indicated his Institute's interest in helping to organize a Nordic Focus Group in the ERD Network.
2. Prof. Kukula from the Institute of Soil Science and Plant Cultivation in Pulawy, Poland has also indicated his interest to collaborate with the IIASA ERD group on GIS-based spatial analyses of land-use characteristics and environmental indicators. They are developing GIS-based rural monitoring systems and are very interested in the planned multi-criteria rural development model.
3. Dr. Szeptycki and Dr. Rogulska from the Institute for Building, Mechanization and Electrification of Agriculture (IBMER) in Warsaw, Poland expressed their (and their Institute's) interest in collaborating with the IIASA ERD group in the planned case studies. In particular, they are interested in the exchange of results concerning rural development projects on biomass production and other types of non-food agriculture. They also offered to collaborate with the IIASA team in the case studies we have planned in Poland.
4. Dr. Mønnesland, from the Norwegian Institute for Urban and Regional Research indicated his interest to collaborate with the IIASA ERD group on regional policy issues - in particular on policy instruments that could promote rural development.
5. Ms. Terluin and Mr. Post from the Agricultural Economics Research Institute (LEI-DLO) in the Netherlands (which is part of the University of Wageningen) indicated their interest to collaborate on the development of regional databases and spatial analyses.
6. Mr. Morrison from the ICT Advisory Service on the Western Isles in the Hebrides, Scotland would like to collaborate with us in our case study work. He is the initiator of one of the most successful rural development projects in the sector of new technologies. With support of the EU LEADER program Mr. Morrison started a Call Center in one of the most remote places of Europe - creating some 300 new jobs.
7. Dr. Jogeir Stokland, from the Norwegian Institute of Land Inventory, has indicated concrete interest to collaborate with the IIASA ERD Core Group and suggested reciprocal visits of researchers for continuing discussions. Details of joint case studies are under discussion. A joint workshop was recently organized in Drøbak, Norway.

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8. Dr. Josef Stasák, NMO Secretary, University of Matej Bela, Faculty of Political Sciences and International Affairs, Kuzmányho 1, SK-97400 Banská Bystrica, Slovak Republic. We are planning joint case studies in Slovakia.

## Members of the Austrian ERD Focus Group

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## External funding

The ERD-Initiative has gratefully received external funding from the following institutions for conducting the initial feasibility study for the project:

1. The Swedish Council for Planning and Coordination of Research (FRN), Stockholm.
2. The Federal Ministry for Education, Science and Culture, Section VIII, Vienna, Austria

After the ERD project was formally established in July 2001, we submitted a joint proposal with Austrian researchers to the Austrian “Kulturlandschafts-Forschung” (KLF) program. Its objective is to conduct 10 to 12 detailed case studies of innovative rural development initiatives in the Alpine region. They would be part of the *Europe-wide* sample of case studies that is currently under way. Several participants of the ERD workshop in Warsaw have also indicated their interest in submitting a joint proposal to the 6th EU Framework Program.

We gratefully acknowledge the support of our ERD Workshops in Warsaw (Poland) and Drøbak (Norway) by the Polish Academy of Sciences (PAS), the Research Council of Norway, the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (FORMAS), and the Academy of Finland, respectively.

## International contacts outside Europe

In March 2002, the ERD project was presented to Chinese researchers at a special seminar on “Rural Development Studies in China” organized by the National Natural Science Foundation of China (NSFC) and the China Center for Economic Research at Peking University. The meeting was also attended by representatives from several Chinese research institutions, including the Research Center for Agricultural Modernization and Rural Development at Zhejiang University, the Rural Development Institute of the Chinese Academy of Social Sciences and the Ministry of Agriculture in Beijing. The Leader of the ERD project presented his previous research on China (China Food CD-ROM) and the current activities in the ERD project. Several participants at the meeting indicated concrete interest to cooperate with the IIASA ERD project, if its regional focus would be extended to Asia. In a separate meeting the ERD project was also presented to researchers at the Institute of Geographical Sciences and Natural Resources Research (IGSNRR) of the Chinese Academy of Sciences. In a memorandum to NSFC and IIASA the Vice Director of that Institute, Prof. LI Xiubin, also indicated interest to collaborate with the ERD project on a case study of rural development in China.

## Chronology

Mid 1999:	Former IIASA Director MacDonald asks Dr. Heilig to develop ideas for a new project focusing on Europe
January 2000:	Initial concept paper on “European Rural Development (ERD)” is sent to all IIASA NMOs
September 2000:	IIASA ERD-Initiative is started to conduct a feasibility study
May 7-9, 2001:	ERD preparatory workshop in Warsaw
June 2001:	Proposal for a new IIASA ERD Project to the IIASA Council

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July 2001: New IIASA project on European Rural Development is formally established

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Sept. 26, 2001: ERD workshop at IIASA, Laxenburg; an Austrian Focus Group was established (25 participants)

Feb. 25, 2002: Joint proposal for conducting “Case Studies of Innovative Rural Development Initiatives” submitted to the Austrian “Kulturlandschafts-Forschung” (KLF) with several members of the Austrian ERD Focus Group;

March 14-15, 2002: ERD workshop in Drøbak, Norway to establish a Nordic ERD Focus Group (20 participants); Decision was made to conduct a joint case study in Vingelen, Norway

March 28, 2002: Invitation to present the ERD project at the “Workshop on Rural Development Studies in China”, organized by the China Center for Economic Research, Beijing University and the Natural National Science Foundation of China (NSFC).

May 23-24, 2002: ERD workshop in Warsaw (with ERD Focus Group on Accession Countries) (in preparation)

## Staff of the ERD project

The IIASA ERD project was officially started in July 2001 to investigate European Rural Development. The IIASA Core Group currently consists of the following people:



Gerhard K. Heilig, Project Leader  
(Germany)



Monica Goldman, Secretary  
(United States of America)



Adriana Pontieri, Research Assistant (Case Studies)  
(Argentina)



Mika Aromäki, Research Assistant (Databases, GIS)  
(Finland)



Ingrid Kaminger (Fee Contract: GIS, Modeling)  
(Austria)