

# EUROPEAN UNION TELEMATIC RESEARCH ACTIVITIES WITH RELEVANCE TO AGRICULTURAL AND RURAL DEVELOPMENT

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Abstract: The Commission of the European Communities has been active in developing the use of computing and telecommunications in scientific information processing in agriculture for almost thirty years. Initially it concentrated its efforts on the introduction of these technologies to assist the dissemination of scientific information. Since the early eighties it has extended this support from farming to agriculture in its broadest sense. Projects have been funded in software development to support most aspects of farming, research and extension. It seems probable that this shall continue in the fifth Framework Programme. Some possible areas of application are indicated and the conditions for participation are discussed

## 1 Introduction.

The Commission of the European Communities has been active in developing the use of computing and telecommunications in scientific information processing in agriculture since the second half of the sixties. Originally it concentrated its efforts on the introduction of these technologies to assist the dissemination of scientific information. This type of activity had emerged from very simple beginnings. The initial impetus came from the USA space programme. NASA contracted out the task of constructing databases of references to scientific documentation in the 1950's. Lockheed won the contract and established the first of the large, commercial on-line scientific information retrieval services. Initially most of the databases used by these services were published in the USA, the most famous being Chemical Abstracts and Medical Abstracts. NASA's initiative provided a stimulus to the growth of other on-line databases in physics, biology and eventually all scientific subjects. Europe's initial response was a similar initiative at ESA. The ESA service was established in 1964 and grew from space related literature initially to the almost 250 databases that it provides access to currently. This was followed by EURONET and the development of the on-line information industry in Europe.

In the sixties (and currently) the major database in agricultural science was based upon the abstracts journals of the Commonwealth Agricultural Bureaux (CAB). These surveyed the world agricultural literature and published abstracts from accredited scientific publications. The Commission, in co-operation with the FAO, established a complementary database called AGRIS in 1975. This service extended coverage of the agricultural literature to non-conventional literature and the scientific work of developing countries.

Throughout the seventies the Commission organised and sponsored the development of AGRIS and other computerised services and the associated tools such as multilingual thesauri, categorisation systems, input and output standards, data collection networks, etc. In the early 1980's it extended its support to an investigation of videotex as a means of disseminating scientific information to a wider

audience. It funded pilot projects in five member states which provided services for extension agencies and farmers. This led, in 1986, to the establishment of an agricultural informatics research programme within the European Communities agriculture research programme.

## **2 The European communities research policy**

### *2.1 Legal Basis.*

This is based on Article 130i and associated articles of the Treaty on the European Union. It is funded over four-yearly intervals under the 'Framework Programmes on Research and Technological Development'. The Framework Programme is a European Community legislative decision, which sets out, for its period of application, the global objectives of Community RTD activities, the specific priorities and research themes to be addressed, the rules and procedures for implementation, the general conditions for participation, the indicative budget and the allocation of financial resources to the various research themes.

The research themes identified in the framework programme decision are then implemented by a number of "specific programmes" which also take the form of Community legislative decisions. These set out the particular priorities, research activities, implementation procedures, rules of participation, budget breakdown, procedures for monitoring and assessing activities, etc. for each research theme.

### *2.2 Research in Agricultural Informatics.*

Agricultural informatics was formally recognised as part of the European research programme in the second Framework Programme (1987 - 1991). Funding commenced with software development in areas such as decision support systems, ergonomics of software system design and use in training. It eventually extended to most aspects of farming (mapping, information retrieval, waste management, irrigation, meteorology, disease outbreak management, disease detection).

In the third Framework Programme (1990 - 1994) the number of projects funded increased and the scope of agricultural informatics was extended considerably. Projects addressed decision support in the production of specific crops, macro-economic modelling, farm accounting and GPS. Research support actions (DSS for crop protection, software support for experimental design, data dictionaries, EUNITA, simulation models) were funded. Engineering was added to the range of topics treated (image processing, precision farming, management of equipment and processes, electronic monitoring of animals). Registers, expert systems and databases for regulatory and advice purposes were developed. An overall research investment of approximately 25 MECU was made in the period from 1988 to the end of 1994. In addition a wide range of workshops and conferences were funded.

The number of projects funded declined considerably under the fourth Framework Programme (1994 - 1998) in agriculture research. However the range of topics was extended to include decision support systems in marketing and policy formulation.

### *2.3 Other Research Programmes*

In the third and fourth framework programme there were some activities relevant to agricultural informatics in other specific research programmes. These were most notably ESPRIT, which funded the Computer Integrated Agriculture initiative; ORA which funded a series of projects relating to the potential of telematics in rural development; and, more recently, the Telematics Applications Programme which funds projects relating to information networks, rural development, rural SME business activities and farm animal tracking.

### **3 The fifth framework programme**

#### *3.1 The Current Position*

The Commission has prepared a draft proposal of the (fifth) Framework Programme. This will receive two readings by the European Parliament and Council, who may table amendments to the Commission's draft text at any time. Once the Framework Programme decision has been adopted, the work of adopting the specific research programmes which implement it begins. These are adopted by the same procedure. Following their adoption a work programme is drawn up setting out, in detail, the research work to be implemented under each programme. Calls for proposals for research projects are then launched on the basis of the work programme or, as is often the case, specific parts of it.

The Commission adopted the draft proposal on the fifth Framework Programme on 9 April 1997. One of its basic premises is that the fifth Framework Programme cannot simply be a continuation of the first four programmes. It is necessary to make a distinct break with them. The background to it is the issue of employment, a major source of concern for European citizens; society's growing requirements in terms of quality of life and health, in particular as regards the quality of food and the environment, and the growing number of questions being posed about the ethical and social consequences of the increase in knowledge; the globalisation of economic activity, trade, markets and knowledge, the spectacular acceleration of scientific and technological progress and the continuing rise in the cost of research.

The Council of Ministers discussed the fifth Framework Programme proposal on 14-15 May 1997. Differences of opinion emerged on a number of issues, notably with regard to the number and content of the thematic programmes. These related mainly to the number of thematic programmes (which may be increased to between four and six) and do not have any bearing on the "information society" theme.

The European Parliament held a public hearing on the fifth Framework Programme on 15 April 1997. The result is a recommendation that it should focus more on the needs of European society and should also aim to correct weaknesses of the earlier Programmes, in particular by addressing the question of innovation - of transferring skills and new technologies into new products and services.

The Commission will probably supplement the proposal with budget figures immediately after the IGC ends in July 1997. However, the Commission considers that the average percentage of EU GNP reached by the 4th Framework Programme between 1995 and 1998 must represent a minimum for the overall funding of the fifth Framework Programme. The establishment of a Council common position is hoped for by the end of 1997. The fifth Framework Programme will probably be adopted by the Council and the European Parliament in the first quarter of 1998. The specific programmes should be adopted by the Council (with only an opinion from the Parliament) by summer 1998. This would enable the programme committees to be set up, the work programmes established and the first calls for proposals to be sent out in the Autumn of 1998.

#### *3.2 Content*

The Fifth Framework Programme shall be implemented through seven specific programmes, three of which correspond to the three themes of the first Community activity, three are linked to the second, third and fourth Community activities respectively, and one is a programme specific to the Joint Research Centre.

The three "thematic" programmes will address the following topics:

- "Creating a user-friendly Information Society".  
This theme will cover systems and services for citizens; new methods of work; electronic trading; multimedia content; and essential technologies and infrastructures.
- "Promoting competitive and sustainable growth".  
This theme will cover manufacturing (products, processes, and organisation); mobility of people

and goods; new perspectives in aeronautics; marine technologies; advanced energy systems and services; and the city of tomorrow.

- "Unlocking the resources of the living world and ecosystem".  
This theme will cover health and food; control of viral and other infectious diseases; the "cell factory"; management and quality of water; environment and health; and integrated development of rural and coastal areas.

Each of the three thematic programmes will comprise a series of key actions; activities for research and development of generic technologies; and activities in support of research infrastructures. They will make a significant contribution to renewed growth; competitive products and processes and creation of jobs.

The second, third and fourth activities shall address the following topics:

- confirming the international role of Community research;
- innovation and participation of small and medium-sized enterprises;
- improving human potential.

The activity "improving human potential" has as its objective the improvement of the quality of researchers, engineers and technicians. Particular attention will be given in the development of the information society to the networking of researchers in the various fields.

*(Note: Details of the evolution of the fifth Framework Programme are on web at <http://www.cordis.lu/>.)*

#### **4 Future research topics under the fifth framework programme**

The specific content of the fifth framework programme (1998 - 2002) has not yet been agreed. The consultation process has been underway for over six months and the first drafts of the annexes to the specific programme decisions are emerging. Agriculture research will form part of the 'living world and ecosystem' theme of the fifth framework programme. Current thinking appears to favour an increase in the application of informatics and a further extension of the technology to high level activities.

In agricultural production we see the following topics referred to:

- decision support for farmers;
- control and analysis systems;
- disease control;
- economic modelling;
- integrated chain production;
- policy monitoring;
- policy management;
- policy and development forecasting.

In food research the application of information technology occurs throughout the current thinking. Particular areas currently under consideration are:

- technology fusion;
- process control;
- robotics;
- innovation diffusion and adoption.

In forestry research the application of information technology currently addresses:

- management systems;

- growth and yield models;
- remote sensing;
- GIS;
- automation and robotics;
- on-line Quality Control systems (expert systems for non-destructive QC);
- communications networks between field and factory.

In the 'information society' theme, while the specific content has not yet settled, it appears that the emphasis in telematics applications, from the viewpoint of this conference, will be on:

- the delivery of public services (in the broadest sense);
- Education and training;
- tourism;
- GIS.

There will be an increased emphasis on basic research in support of these aims.

## **5 Competing for research funding under the fifth framework programme**

What follows is some indicative advice on applying for Community research funding. The complete set of rules and guidelines will be published in the Framework Programme decision, the specific programme decisions, workplans and information packages. The outline below is meant to be a guide to those who have not yet participated in a Community-funded project and who wish to begin their planning for doing so next year.

### *5.1 The Consortium*

A research proposal should be submitted by a group of research entities (known as a consortium). This should contain two non-affiliated participants from different member states or from one member state and one affiliated third country (Iceland, Israel, Liechtenstein, Norway). There are special conditions for participation of partners from other states. The consortium should not be too big and should contain all appropriate skills while avoiding unnecessary duplication of skills. It should also contain users or representatives of user groups. Ideally it should decide the topic and the consortium agreement before the call for proposals is published. These are currently expected to be published around September 1998 onwards. It should aim to begin the drafting of the proposal in good time and finalise it after publication of CFP.

### *5.2 The Project Content and Structure*

First and foremost the proposer should read and understand the rules of participation. Many proposals are eliminated because of non-compliance with the general or specific criteria for submission to a call for proposals. Once these conditions are met the proposer should ensure that the project proposal addresses work described in the work programme of the research programme which he is addressing. It should be well focused and should concentrate on a well defined set of specific tasks in the work programme. It should envisage concrete results which correspond with the commercial objectives of the members of the consortium and should have a plan to exploit those results. As the independent evaluators are increasingly being requested to comment on the budget of proposals, the project should have a robust or modular design which will permit it to proceed should elements of the project be removed or the budget be reduced in negotiations. The project should envisage a realistic timetable to start its work. Under normal circumstances it takes about one year from publication of the CFP to finalise a contract. The project should also ascribe realistic time scales to the different tasks. Most projects allocate insufficient time to project start-up. This imposes a strain on the consortium from the beginning and in many cases requires a contract amendment to re-align the timetable and milestones.

Exclude motherhood statements and over-ambitious claims. The proposer should not try to sell the project as a general panacea to cure all the ills of the EU. This normally reduces the credibility of the proposal in the eyes of the evaluators.

Specifically the proposal structure should follow the proposal format provided by the programme to which it is addressed (if such exists). Ensure that, at a minimum, the proposal describes the following:

- what is proposed;
- the problem to be addressed;
- how the project will provide solution to this;
- the background state of the art;
- the starting point;
- the proposed project achievements, targets and results;
- how the needs of users are to be addressed;
- the rationale for the approach adopted (especially why it is better than what exists currently);
- the achievements of the members of consortium relating to the project;
- the contribution of the project to EU policy (in the relevant section). Include this once in the proposal. Do not continually refer to it throughout.

### *5.3 Project Management*

One of the major causes of problems within projects is a lack of project management expertise or failure to allocate sufficient resources to management. Ideally the co-ordinator and the major contractors should have the required experience in international project management. Where this is not the case some projects have subcontracted this task. Whatever approach the consortium adopts the project should have a clear management structure. Responsibilities for each task should be defined. The inter-relationships between the task managers should be clearly stated and procedures in place to cope with departures from agreed actions and plans. The project should have a clear workplan. It should pay particular attention to the initial stages of the work, devoting sufficient to time start-up and to the background review. It is advisable to cost the project realistically. This helps to avoid misunderstandings during the course of the project. In this respect each partner should make reasonable estimates of manpower, personnel and overhead costs.

### *5.4 Evaluation*

The project proposal will be evaluated by independent experts on the basis of a number of criteria. These include the general criteria pertaining to the Framework Programme and criteria which relate to the specific programme. Over time many of these latter criteria have become common to all specific programmes. The proposal will be judged on content and form. The relevant elements have been referred to in the previous sections. In addition the following criteria are stressed.

It should be within the scope and objectives of the programme. It must have a European dimension, i.e. it should demonstrate added value as opposed to a national project. It should also contribute to European policies. In this case it is advisable to quote the name and relevant section of the European legal instrument and to include a realistic description of the contribution of the project to the objectives of the policy.

The project should be of high scientific quality. It should be technically and scientifically sound. It should be innovative and represent a significant step forward in the state of the art and include substantial original work either in science, application or approach. It should also demonstrate awareness of the state of the art of the technology.

The project should demonstrate an understanding of the market situation and user needs and be relevant to current market needs or opportunities. If possible and appropriate it should contain an economic evaluation of the domain addressed by the project and the potential impact of the project.

It should contain an exploitation plan.

## 6 Close

The objective of this paper was, firstly, to refer to the background to the European Communities role in the foundation of EFITA; secondly, to bring the conference participants up to date on the state of development of the next Community research programme and; thirdly, to give a brief indication of how to participate in that programme. Hopefully, it will motivate some of you to participate in it and continue in the footsteps of those researchers who have helped define European activity in the subject area. This conference is an historic occasion in that it launches the European agricultural informatics research profession. It is also a memorable occasion for all those who have been involved in the establishment of the profession. Great praise is due to Dr. Iver Thysen who has steered the EUNITA project to such a successful conclusion and successfully terminated the work begun almost thirty years ago. I would also like to look back to the beginning and dedicate this paper to Dr. Herbert Buntrock, who started that work and who inspired those of us who knew him to continue where he left off on his untimely death.

*(Note: This paper was composed from the personal experience of the author, private communication with colleagues and the CORDIS web site. The views expressed therein are those of the author alone and not those of the European Commission.)*