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Key Action 5 External Advisory Group Report

Report and opinion of
research carried out under
the European Commission's
Fifth Framework Programme
[1998-2002]

Sustainable Agriculture,
Fisheries and Forestry,
and Integrated Development
of Rural Areas including
Mountain Areas



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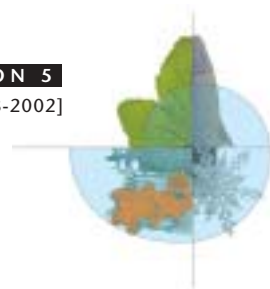
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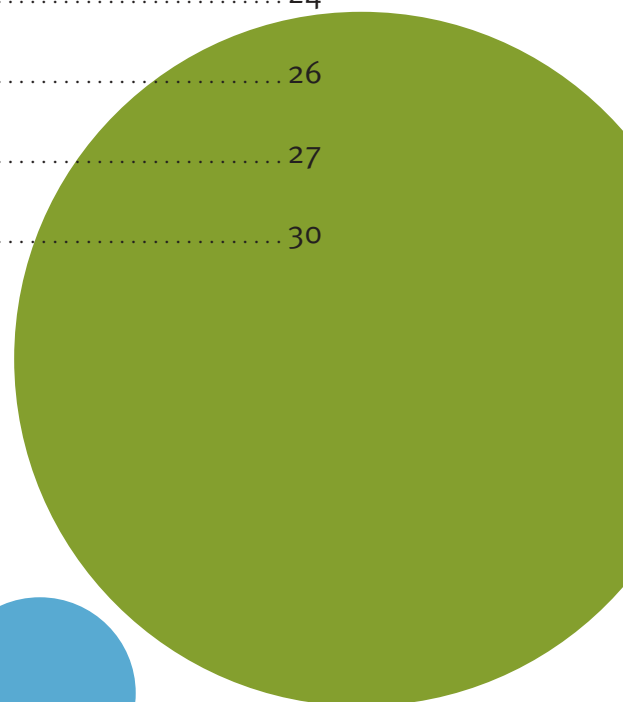
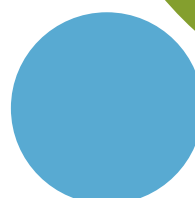
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Foreword

I am pleased to welcome you to this insight into agricultural, forestry, fisheries and aquaculture research carried out under the European Commission's Fifth Framework Programme for research (FP5). This brochure provides you with a view of these activities as seen through the eyes of the independent External Advisory Group (EAG) which was brought together by the European Commission (EC) to critically appraise and guide this research sector in FP5.

As Chairman of the EAG, I worked with experts from across Europe representing the diverse sectors found within the key action. The Group's objective was clear – to ensure that the EC developed and implemented a research programme for agriculture, forestry and fisheries that would improve knowledge and practice and thereby implement the Commission's mandate from the Council and the Parliament.

The successful application of the programme was a great challenge, both for the EAG and the EC. With such a broad research area addressing, amongst others:

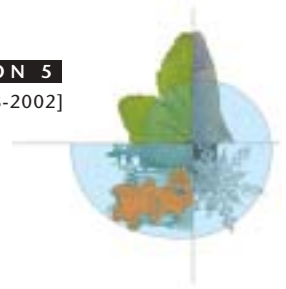
- industrial competitiveness,
- sustainability,
- rural development,
- environmental impact,
- consumer demands, and
- production practices,

and where almost 50% of the total EC budget is used to support producers, it was not always easy to ensure that funding had the right focus.

With this challenge, however, the EAG worked closely with the EC throughout FP5 and our conclusion is that the research funded was indeed focused on critical issues, and that it laid the foundation for improvements at all levels of the food and forestry chain. The 340 research projects funded run on many different levels, from laboratory research through production and harvest. We are convinced that the outcome will be the ultimate improvement of products and services delivered to the consumer by the agri-food and non-food chains.

EAG Chairman (2000-2002)

Professor Fons Werrij



Introduction

The European Commission's Fifth Framework Programme for research ran from 1998-2002¹. One of its principal thematic areas was the "Quality of Life and Management of Living Resources". This thematic area comprised six specific key actions, one of which – Key Action 5 – dealt with agricultural, fisheries and forestry research including rural and coastal development.

This brochure represents an independent review of the work carried out in Key Action 5. It aims to give the reader, whether involved in research or policy formulation, an insight into how European research policy was shaped and the impact of its results.

It is based upon the views and opinions of the independent External Advisory Group (EAG)² who worked with the European Commission between 1998 and 2002, the duration of FP5. The EAG acted as an impartial body to guide the EC on all aspects of funded research and its views on how this key action was run, both complimentary and critical, are summarised herein. The EAG helped the Commission on an annual basis to revise the work programme for the following year and in this respect a number of dedicated workshops were held to help gather ideas for formulating the text.

It begins by introducing FP5 and its research objectives. It then describes the opinions of the External Advisory Group on the diverse and challenging sub-areas of Key Action 5. The viewpoint of the EAG members described here is very much a personal one and has been put together based on their familiarity with the work programme objectives and the results of research funded by the programme over six different calls for research proposals between 1998 and 2002.

¹ Decision No. 182/1999 adopting the Fifth RTD Framework Programme, 1998-2002

² <http://europa.eu.int/comm/research/fp5/eag.html>

Dr Finn Røksen

"Europe has strong industrial links with agricultural, forestry and fisheries production, extending beyond the traditional use of land and water for food production, and the European Commission has a responsibility to promote the transfer of research results to those SMEs best placed for their rapid exploitation."





The Key Action 5 Programme

The full title of Key Action 5 **'Sustainable agriculture, fisheries and forestry and integrated development of rural areas including mountain areas'** applies to a very large percentage area of EU topography. This illustrates the mammoth task facing the European Commission when planning a four-year research programme covering several distinct industries, supply chains, and consumer groups, each with their own distinct cultures, challenges and needs.

Key Action 5 set itself significant and ambitious objectives, reflecting the relevance of sustainable production in Europe, not only for the supply of food and raw materials but also for its strong links with rural and coastal economies, culture and the environment. These objectives included, notably:

- Enhancing competitiveness of rural economies and recognising the changing demands that society places upon the food chain;
- Ensuring sustainable and long-term production within all sectors for the benefit of future generations;
- Producing high-quality products, particularly relevant in a decade where Europe has experienced significant food scares such as BSE, foot and mouth disease, and *E. coli* outbreaks in the food chain.

During Key Action 5's four-year lifespan, the EC invested almost €500 million in research to achieve these objectives, through research priorities set out in the following sectors:

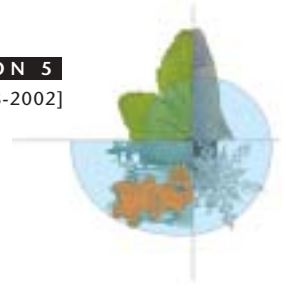
- Plant systems, encompassing low input farming, organic farming, plant health and related agri-environmental issues;
- Animal systems, including animal health and welfare and animal genomics;
- Sustainable fisheries and aquaculture;
- Non-food development, covering biomaterials and aspects of bioenergy;
- Forestry management and forest products;
- Support to the Common Agricultural Policy and Common Fisheries Policy; and
- Rural development.

With objectives that relate directly to landscape and coastal economies across Europe, it was critical that research actions in Key Action 5 identified and addressed issues central to their sustainable development. Not only do these economies provide employment, they are also a source of scientific innovation, of cultural diversity, of food and natural resources for millions of people, and the biggest single influence on the European environment.

"The European Commission responded well to advice given by the EAG throughout FP5 and focused efforts on calls for proposals and evaluation methods. That focus now has to extend to project exploitation, ensuring relevant research is translated into commercial application and supporting policy."



Professor Mårten Carlsson



The External Advisory Group (EAG)

The EAG was composed of academic and industrial scientists from EU Member States and associated countries. Meeting two or three times a year, the group reviewed the proposed Key Action 5 Work Programme, highlighting areas of critical importance for research, ensuring that the Commission did not, for example, simply respond to those areas of agriculture with the greatest media profile.

Research projects were selected from annual calls for proposals. Following each deadline for proposals, the EAG received feedback from the Commission on what had been submitted, and on those projects selected for funding. The group evaluated how well researchers had responded to the call and identified both strengths and weaknesses in the overall research portfolio as it developed.

The EAG members performed a critical role by using their expertise and experience to look at the Europe Union's long-term agricultural, forestry and fisheries research needs. In such crucial industries, setting out the right long-term priorities for research is essential. The EAG was pivotal in ensuring that research not only responded to short-term, high-profile issues but also focused on building a sustainable industry and countryside for future generations.

The work of the EAG was supported by a number of workshops proposed by the EAG and held by the Commission on key areas of research, including:

- GMO competitiveness in Europe;
- Developing a sustainable and competitive agriculture in Europe;
- Promoting integrated and sustainable development of rural areas; and
- Crises in the food chain.

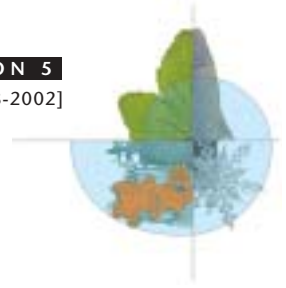
These one-day workshops drew together researchers from across Europe for discussion and provided ideas to help the Commission formulate research policy and redraft the work programmes in specific sectors.

Key Action 5 addressed a wide range of research sectors. This brochure provides details about those sectors, highlighting their aims, the research projects that were undertaken, and how well Key Action 5 performed against its initial objectives, as seen through the eyes of the EAG.

The enormous range of research supported by Key Action 5 was ambitious and the EAG was unanimous in its opinion that FP5's short funding period (1999-2002) could never have a dramatic short-term impact on each and every sector. Rather, the EAG anticipated that Key Action 5 would create and reinforce a framework for the future sustainable development of Europe's natural resources.



EAG member	Organisation	Expertise related to KA5
Professor Fons Werrij, Chairman	Wageningen University and Research Centre, The Netherlands	Management of biotechnology in agriculture
Dr Ernst Rasche, Vice-chairman	Bayer CropScience, Germany	Industrial biotechnology in agriculture
Professor Mårten Carlsson	Retired from SLU, Sweden and the Nordic Forestry, Agricultural and Veterinary University	Rural development
Dr Finn Rexen	Danish Ministry of Food, Directorate for Development	Non-food in agriculture
Professor Joyce Tait	SUPRA, Research Centre for Social Science, Scotland	Rural development and social issues in agriculture
Mr Alain Maucorps	Retired from IFREMER, France	Fisheries
Dr Paolo Raddi	Plant Protection Institute of the National Research Council (CNR), Italy	Forestry
Dr André Pouzet	CETIOM, France	Agronomy
Dr Leena Paavilainen	Wood Wisdom, Finland	Forestry
Professor Ilan Chet	Hebrew University of Jerusalem, Israel	Plant biology
Dr Branislav Petko	Slovak Academy of Science, Slovakia	Animal health
Professor Ewa Lojkowska	University of Gdansk, Poland	Plant biology
Dr Silvia Zanuy	Institute of Agriculture, Spain	Animal health
Dr John Lee	Teagasc, Republic of Ireland	Plant biology
Dr Manfred Wörgetter	Federal Institute of Agricultural Engineering, Austria	Non-food in agriculture
Professor Herman Müller	Institute of Virology, University of Leipzig, Germany	Animal health
Dr Dirk Langstraat	Dutch Fish Products Board	Fisheries
Dr Tom Thomas	TEAGASC, Ireland	Agronomy
Ex-chairman, 1998-2000		
Professor Markus Hofreither	University of Natural Resources and Applied Life Sciences (BOKU), Austria	Rural development
Ex-vice-chairman, 1998-2000		



Plant systems

Plant research covered the whole growth cycle from seed production to post-harvest storage. Research tools varied from the use of genetic methods to help understand and manipulate plant characteristics, to the latest satellite technologies for monitoring and forecasting plant disease. Key Action 5 projects focused strongly on farming systems and plant health with the aim of improving the exploitation of the complex relationship between crops and the environment. It also aimed at promoting more environment-friendly production and methods, with a particular focus on organic farming. The main objective was to achieve new, reliable production methods, safe products, and better methods for detecting and overcoming problems and thresholds for treatment of plant disease.

Given the significance of the introduction of genetically modified crops and their high media profile, attention in Key Action 5 was also given to comparisons between conventional and GM crops and their possible effects on the environment in the longer term.

From cell to field

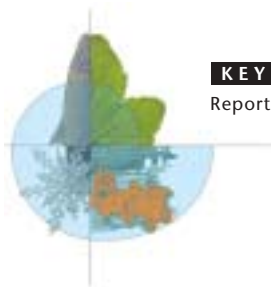
Innovative projects addressing many aspects of plant health and growth were funded under FP5. Projects focusing on improved understanding at the cellular or molecular level dominated proposals accepted for funding. These included, for example, modification of rice to improve resistance to fungal disease, improving the expression of genes inserted into a genome, antibody test kits for harmful plant viruses,

analysis of gene flow from domestic to wild plants, and the analysis of gene action that could help to improve crop health. While these projects relate to early-stage research (their effects will not be felt in the field for a number of years), they demonstrate the potential of research at the molecular level to bring significant practical benefits through either genetic modification or through conventional breeding based on a deeper understanding of the plant pathogen relationship.

Improving the management of a whole crop requires an intimate understanding of the control of growth and form. Management of a whole plant includes dictating size, lifespan, growth and reproductive phases, and movement of nutrients to the fruit or seed – all characteristics of a plant that determine size, time and quality of harvest. The project case study on page 12 (see box) demonstrates the value of whole crop plant management in disease prevention and healthy crop production.

A significant number of projects included work at the field level with the use of increasingly sophisticated technology in the forecasting of plant disease, and in harvesting or processing mechanisms. Such projects included producing geographic information for potato disease control, devising thermal cutting devices for vegetable harvesting, quality monitoring in wine production, management of soil health, and the suppression of crop disease through improved cropping systems.





The EAG view

The EAG advised on the content of each call for proposals in FP5, often highlighting key issues or new threats to crop production in Europe, and calls were regularly adapted to reflect research priorities.

The most significant role played by the EAG in this sector of research was keeping an open mind about the benefits or risks of genetically modified crops, and supporting the collection of independent data. With the continuing storm of media controversy across Europe, it would have been very

BLIGHT-MOP: fighting Europe's agricultural plague

Potato late blight is a serious disease in both conventional and organic agriculture, causing drastic crop loss. Control is difficult, particularly in organic systems and, following a ban in 2002 on copper sulphate, the main organic control agent, it has become critical to seek alternative protection measures.

'Blight-Mop' is a five-year, €6 million research project bringing together researchers from across Europe to develop a multifaceted approach to the control of late blight. Critical research areas include:

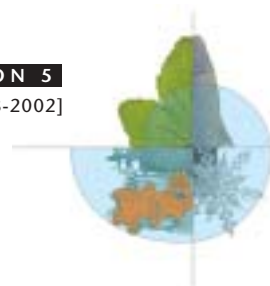
- Resistance management: New potato varieties have been studied for blight resistance in organic systems. A purple-skinned potato from a Hungarian breeding programme has proved an important discovery, displaying a high degree of innate resistance which could make it a valuable tool in preventing the spread of disease.
- Blight-Mop is investigating a number of management systems, including changing potato planting depth, sprouting potatoes before planting, manipulating nutrient input, and planting barrier crops, with the overall aim of preventing and slowing disease development.

The combination of these two research areas should result in potato varieties and cropping patterns that delay the onset of blight to a point in the growing season where the disease can no longer have any economic impact on the yield.



For more information:

<http://europa.eu.int/comm/research/quality-of-life/ka5/en/31065.html>



easy for the Commission to respond to short-term pressures. Instead the emphasis within Key Action 5 was put on collecting information that was scientifically sound and relevant.

While it is important to respond to public concerns, the EAG felt that such concerns required research aiming at the acquisition of knowledge. Hard scientific evidence was the driving concern and not media opinion and high profile controversies. Professor Joyce Tait stated: "Research driven purely by response to popular demand would not be well targeted or executed and biased results would prevent European citizens judging for themselves what future GM crops have. The EC serves its citizens best through well-structured research that seeks to answer longer-term questions."

Organic production

The second key area of plant research that concerned the EAG was organic production. Funded projects covered policy and production issues and included topics such as overcoming barriers to organic conversion, analysis of organic markets and policy, weed control in organic wheat, intercropping and worm control in small ruminants.

Organic farming is the fastest growing agricultural market sector in the EU. However, the EAG was concerned that too great an emphasis was being placed on such production methods at the expense of other low-input or integrated production systems.

Dr Ernst Rasche of Bayer CropScience and an EAG member commented: "The perceived nutritional and health status of organic crops is a common misconception and people fail to appreciate that integrated crop production with the application of damage thresholds for the control of pests, diseases and weeds is efficient and a sustainable and environmentally sound way forward for European farming."



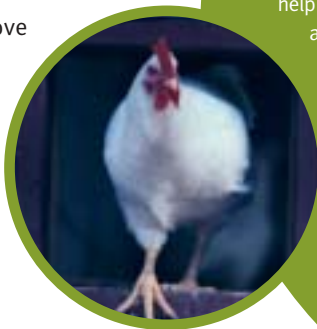
Animal systems

Animal welfare remains a contentious issue in Europe. Consumers are concerned about intensive farming methods and the conditions animals face when being transported. Combining these factors with the link that has emerged between animal management systems product quality and disease transmission, the Commission has chosen to focus on animal health and welfare in FP5. Research into infectious disease was shared with other priorities in the Framework Programme, and Key Action 5 focused on reducing disease and increasing resistance through a better understanding of animal genetics and animal welfare systems.

Biotechnology applications have an increasingly important part to play in research into animal welfare and health. Genomic and proteomic tools are being used in a range of projects: for example, the use of protein markers for immunological stress; producing gene expression profiles as a means of predicting pork quality; and identifying loci associated with milk quality and for improving the sustainable production of turkeys and chickens.

Following the herd?

Research into animals was beginning to move decisively down the food safety route in FP5 as BSE, dioxin



and *E.coli* made headlines across Europe. A key task for the EAG in this research area was to assist FP5 in responding to scientific fact rather than to media headlines. Many of the group's recommendations were used to adapt the work programme with a holistic examination of animal production, the aim being to prevent disease through good health and welfare at the beginning of the food chain. The EAG believes that such an approach is essential to sustain long-term animal production systems across Europe.

Disease-free chickens – from the genes up

The production of chickens for food is a significant industry in Europe. As production intensifies, pathogens affecting chickens are becoming increasingly aggressive, posing a threat to animal health and creating problems for producers and consumers alike.

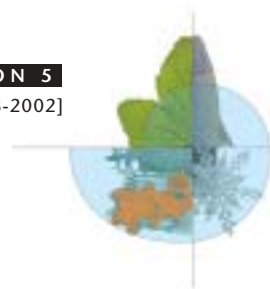
CHICKEN-IMAGE is a three-year, €3.7 million project investigating chicken disease immunity at the genetic level. Its long-term aim is to allow for the breeding of chickens immune to key diseases. Novel genes found in gene clusters of immunological importance are being studied as these clusters can either control resistance to pathogens or affect the course of disease development.

Development of microarrays (tools that allow the analysis of thousands of genes) will help study the 15 000 genes expressed in chickens that are linked in one way or another to the immune response. Use of such gene arrays will aid the rapid identification of specific gene subsets linked to pathogen control while allowing comparisons to be made of gene expression in disease-resistant and susceptible birds.

Rather than use such genetic knowledge to produce transgenic chickens, researchers within the project aim to use this information to accelerate effective breeding programmes. For example, simple genetic tests will identify which birds have a disease-resistant gene profile, thereby allowing for the rapid production of disease-free chickens across Europe.

For more information:

<http://europa.eu.int/comm/research/quality-of-life/ka5/en/01591.html>



Non-food research

European Union interest in the non-food industrial uses of agricultural raw materials goes back almost 15 years. It stems originally from a desire in the EU to find alternative uses for intervention stocks being produced in Europe as a result of the hyper efficiency of the Common Agricultural Policy (CAP) during that period. Subsequent political developments in the early 1990s, such as the first CAP reform and the Uruguay Round, led to production controls and indirectly stimulated non-food interest through the resulting availability of land set aside with new limited subsidies for industrial crops.

In parallel, global commitments were signed by the EU to clean up and control environmental damage – industrial crops were considered as a potential source of renewable and sustainable materials and energy. Furthermore, technological progress had profoundly increased our understanding of the plant and microbial kingdom and how they can be adapted for the benefit of mankind.

Key Action 5 sought to encourage the production and exploitation of biological materials for non-food use by offering a broad range of possible applications: biopolymers for packaging and construction, fine chemicals for use in pharmaceuticals, bulk chemicals for lubricants, solvents and detergents, and biofuels for energy and transport.

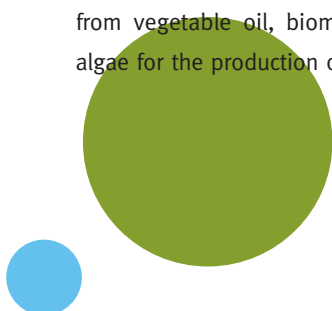
Funded projects demonstrated the potential for non-food use of materials, including hydrogen from biomass, biopolymers from vegetable oil, biomedical textiles from chitin, and algae for the production of bioplastics.

An alternative agriculture?

The EAG member most concerned with non-food applications, Dr Finn Rexen, had mixed views on the success of this area of research: “There is a real need to move more land to non-food applications – particularly if we increase the amount of land outside direct food production to reduce surpluses. The land cannot be left fallow without a significant negative impact on its future productivity and biodiversity support. However, at present there is not enough political will or commercial incentive to make such a large shift away from food production.”

Studying the proposals funded over the lifetime of FP5, Dr Rexen was disappointed by the overall lack of innovation and by the lack of industrial coordinators, although industrial participation in these projects was high at around 33% of the partnership. Many projects were based on existing technologies and few planned to take their results to the market place in the short term. This is perhaps more an indication of lack of commercial ‘pull’ for these technologies at the moment and the fact that in general these are ‘substitute’ materials which are still more expensive than the fossil-based equivalent. Dr Rexen drew attention to key areas of non-food application including biofuels, packaging and biochemical production where not enough progress is being made on the innovation front.

With reference to liquid biofuels, valuable work is currently being carried out in Denmark and Poland but the relatively high price of these products makes it hard for them to





compete against fossil-based fuels. This may change, however, as the price of oil is driven up by increasing demand and global events.

Fear of change

Fear of product rejection by consumers is holding many companies back from investing in certain technologies. Consumer rejection of genetically modified crops in Europe and the subsequent collapse of any potential market for such crops demonstrate this. Production of fine chemicals or therapeutic molecules carries with it a similar risk of rejection,

although such crops would never enter the food chain until lengthy and extensive testing and validation had been completed. External interest in non-food however was very high as shown by the subscriptions and visits to the BioMatNet website (<http://www.nf-2000.org/>) which is dedicated solely to the dissemination of results and developments coming from this sector.

SMEs across Europe in particular have indicated a strong interest in alternative uses of crops and agricultural materials. A recent survey by Dr Rexen identified SMEs across the Baltic area interested in technology transfer from non-food materials research and, he believes, it is important that this trend is nurtured in future Framework Programmes.

However, it is noted that this type of research has not been considered as a priority sector under the Sixth Framework Programme (FP6).



The four-year BIOFOAM project aims to take materials extracted from bio-waste streams and make them into polymeric foams that meet high industrial performance criteria, while also being recyclable and cost effective. Current polyester foams are not biodegradable and are made from petroleum feedstock – a source that is cheap now but which may run out in the future.

To compensate for possible higher costs in extracting raw materials from waste, the project seeks to maximise foam production efficiency and derive high added value products. The problems are being examined on several fronts. First, suitable sources of waste are being identified in a comprehensive data search. Block co-polyesters (co-amide and co-urethane) will be made in the lab from the most promising sources. These will then be scaled up, with a target cost of no more than one euro per kg.

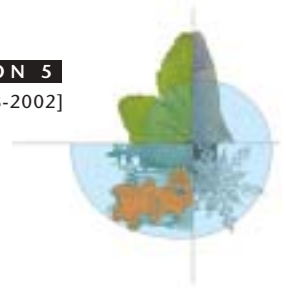
To improve process efficiency, foaming experiments are under way on existing polyester amide copolymers, combined with the numerical modelling of foaming behaviour. The aim is to improve current equipment and to select new polymers that have the best foaming performance and produce the most stable structures.

Life Cycle Management Analysis is integrating economic, environmental and labour factors to direct the development of renewable biopolymers and biofoams. They should be able to compete on cost and performance terms with current products such as polystyrene and polyisocyanate.

Industrial foam from bio-wastes

For more information:

<http://europa.eu.int/comm/research/quality-of-life/ka5/en/o1298.html>



Forestry and forest products

There are many reasons why forestry has a critical role to play in Europe's economic and cultural life. Over 30%, about 215 million hectares (ha), of Europe's landmass is covered by forests or wooded areas, the diversity of which is enormous. Arctic conifers and birch cover the North, deciduous and alpine trees predominate in central Europe, and cork oaks and pines are distinctive in the South.

Europe is the world's second largest producer of paper and sawn wood, the foremost importer of forestry products, and the world's third largest exporter. In 1998, the continent's forestry-based production was valued at more than €300 billion, and employed 2.2 million people. The EU's forest strategy¹ recognises the immense importance of nurturing a production system that impacts on so many sectors.

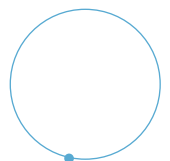
Key Action 5 forestry research was split into two areas: forest management and the forest wood chain. KA5 sought to add good practice to forest management with calls for proposals covering subjects such as evaluation of goods and services from forest products, linkages to rural development, and provision of information on forest usage for policy-makers.

Protection, conservation and restoration of forest ecosystems were priorities, as were finding ways to prevent and control diseases and pests. Scientific study areas also included water management, erosion control, and avalanche and landslide management.

¹ http://europa.eu.int/comm/agriculture/fore/comm/649_en.pdf

Healthy forests

Dr Paolo Raddi of the Institute for Protection of Plants in Florence, Italy believes that KA5 offered sound research priorities, particularly in the field of health where, by way of example, he points to the excellent work that was carried out on tackling disease in several forest tree species.



Dr Paolo Raddi

However, Dr Raddi believes the application of results in the commercial world could be enhanced. "We need to keep improving transmission research to SMEs," he said. A greater emphasis on demonstration projects would also have helped to distribute results to a wider audience.

Seeing the wood for the trees

Efficiency of wood production would be vastly increased if planting and management could produce known timber quality and characteristics, satisfying the stringent requirements of wood-pulp producers, furniture manufacturers and the construction industry.

A research project which aims to make such improvements has been initiated, bringing together a diverse range of partners from industry, universities and scientific institutes.

Samples were taken as indicators of tree state before a selection of the trees were felled. A number of biological, biochemical and mechanical tests were performed to assess wood quality, and the results were linked back to the structure of the wood. This allowed modelling of wood quality to be carried out and the subsequent prediction of growth and quality characteristics.

The overall outcome of such work will enable accurate prediction of wood characteristics and quality from the planting stage onwards, meeting requirements specified by customers.



For more information:

http://europa.eu.int/comm/research/agriculture/project_showcase/mefyque.html



The forest wood chain

From the moment a tree is cut down to the point where the end product reaches the market, the timber is said to be travelling through the forest wood chain. As a consequence, this research sector impacts on many areas from forest management to industrial competitiveness. This situation was reflected in Key Action 5's calls for proposals which included projects to improve forest inventory methods, growth and yield studies, environmentally friendly production processes, and uses of recycling technologies. Market-place issues were covered via enhancements in the manufacture of pulp and paper fibre. Labelling and product testing also found a place in KA5's remit.

A well-planned work programme benefited from inputs from a range of people thereby avoiding a 'top-down' approach to decision-making. "Industry representatives together with the researchers themselves were heavily involved in shaping the programme which helped ensure that it met the sector's needs," added Dr Paavilainen. "And we were able to make amendments to the work programme which showed a good, flexible approach to addressing changing research priorities."

EAG member Dr Lena Paavilainen is programme coordinator of 'Wood Wisdom', the Finnish Forest Cluster Research Programme. She believes Key Action 5's broad approach to forestry research paid dividends.

"KA5 was well targeted at the forestry cluster because the whole of the production chain was covered – in particular, the industrial processes side worked well."

The poplar tree is common throughout Europe.

Foresters like it because it is fast growing. As a crop, however, it has a drawback in that the properties of its fibres are not quite ideal for the biggest potential market – pulp for paper products. As a result, Europe imports large amounts of eucalyptus which fits the bill perfectly. Researchers in France, Germany, Sweden and the United Kingdom working on the EU-funded POPWOOD project think they may have the answer to the poplar problem.

The project aims to use genetic engineering to improve the properties of the poplar tree as a cash crop in European silviculture. Using the arabidopsis plant – one of the few plants to have been fully genomically mapped and which is genetically very close to the poplar – as a genetic resource, the researchers believe they can improve the poplar to the benefit of foresters across Europe. The ultimate goal is to evaluate the possibility of using young trees of just a few years old as raw material for pulp production, which could offer novel economic opportunities for rapidly exploiting transgenic traits.

So far the researchers have produced poplar hybrids that offer pulp producers the promise of much improved properties. The project team has set out on the path of commercialising their results, selecting the genes they believe will give the best results and testing the properties of the resulting hybrid trees.

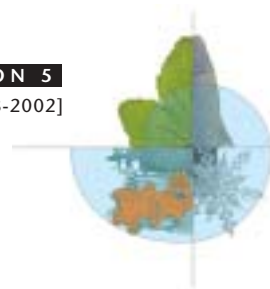


Making poplars more popular



For more information:

<http://europa.eu.int/comm/research/quality-of-life/ka5/en/01209.html>



Fisheries and aquaculture

Few areas of food production have seen greater long-term difficulties than Europe's fishing sector. Over-fishing has resulted in the rapid decline of many fish stocks, with cod the most prominent victim as stocks seem on the verge of collapse in the North Sea. European countries have acted multilaterally since 1971 in an attempt to conserve fish stocks and, in 1983, the Common Fisheries Policy was born through painful international negotiation. However, while the overall story may be a simple one of over-exploitation with a solution dependent on conservation and restriction, other factors make the situation more complex. The contribution of fishing to the average gross national product is less than 1%, employing a modest 260 000 people in the direct harvest of fish. However, fishing is often the primary industry and employer in remote areas, accounting for a significant percentage of jobs in communities where few alternative occupations exist.

The aquaculture boom

Aquaculture has thrived in response to the decline in fish stocks, but this young industry has its own problems – pollution, disease and impact on local ecosystems are limiting factors and the industry has some way to go on its road to maturity, particularly if it is to provide a viable commercial and environmental alternative to 'wild' fishing.

Research into fisheries and aquaculture is thus a significant long-term challenge for European scientists and industry, compounded by the difficulty of assessing populations in marine rather than terrestrial environments. The Fifth Framework Programme built on fisheries research in the four

previous Frameworks, with Key Action 5 focusing on specific aspects of fisheries management and protection.

Research in this sector included assessing the impact of environmental change on commercially harvested living resources; the impact of fishing on marine ecosystems; genetic diversity; damage caused by fishing gear; and targets for sustaining biodiversity.

The importance of the fishing industry itself was highlighted through calls for research into better fisheries management, and improving relationships and communication between biological, economic and fleet capacity factors. Resulting research activities included reducing fraud in vessel monitoring, identification of essential fish habitats, improved monitoring through satellite technology, economic responses by fishermen and acoustic estimation of fish abundance.

Biotech boost

Biotechnology had a key role to play in underpinning future fisheries and aquaculture development. For example, genomic mapping for desirable traits will lead to more focused breeding programmes, not only for commercial purposes but also as an intelligent approach to combining sustainable fish production with biodiversity and a stable ecosystem. The emphasis on biotechnology as a tool led to research projects covering the control of bivalve reproduction through a reproductive hormone receptor gene, molecular characterisation of key traits in fish, genetic factors in disease susceptibility, and genetic tags to allow stock structure analysis.



Mr Alain Maucorps

Spawning a new era

Alain Maucorps, of IFREMER (French Research Institute for Exploitation of the Sea), brought fisheries expertise to the EAG, offering a balanced view of how Key Action 5 addressed critical topics in this research sector. He saw fisheries take a slightly secondary position to some of the headline issues that arose during FP5, such as the BSE crisis and the foot-and-mouth outbreak, topics which he appreciated were correctly at the top of the agenda. "Agriculture and forestry were really dominant and the membership (of the EAG) reflected this. The major concerns, legitimately I think, oriented towards these domains."

While he was pleased with the response of the Commission to priority research themes in the fisheries sector, he felt that greater importance should have been given to the role of biotechnology as a long-term tool. "The relative importance and impact of biotechnology development and genetic research, for instance, will certainly have similar magnitude in aquaculture as in agriculture and should have received similar consideration," he said.

Aside from wanting a more high-tech approach to identifying and solving fisheries problems, Alain Maucorps also saw problems with the gap between science and society in the sector. "The need to change the relationship between fishery scientists on the one hand, and the fishing industry, the regulatory authorities and general public on the other, has been identified for some time but little is being done to come up with practical actions and/or operational structures. The lack of understanding of the real issues is curbing positive evolution in terms of sound management, sustainable fishing and ecosystem protection.

Saving the wild salmon of Europe

All authorities agree that wild salmon throughout the Atlantic Ocean are at risk, with stocks in one-third of the salmon rivers in Europe and North America at a dangerously low level. In a three-year project, SALMODEL, the European Union has developed a coordinated approach to managing the wild salmon fisheries in the North-East Atlantic. Sustainable fishery management depends on knowing how many fish there are in each part of the region, and how the numbers alter over time: this involves estimating stocks before fishing began and forecasting the effects of conservation.

International organisations involved in protecting wild salmon include the International Council for the Exploration of the Sea (ICES) and the Atlantic Salmon Federation (ASF). If conservation efforts are to be effective, it is vital for these and other national organisations to use the same definitions and biological reference points to determine safe limits. SALMODEL focuses on verifying the quality of data and the models that interpret them.

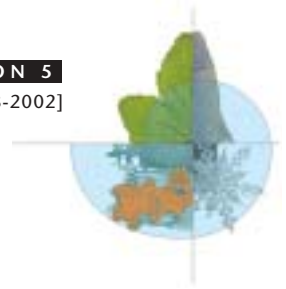
The project began by reviewing national data and the regional progress made on conservation limits. It examined methods for interpreting data on stocks and using data from one region to draw conclusions about another.

It also made a risk assessment of using model results to give management advice and evaluated alternative fishery management methods. ICES recognises the new information that has been squeezed out of old data by SALMODEL.



For more information:

<http://europa.eu.int/comm/research/quality-of-life/ka5/en/o1546.html>



Support to policy

Key Action 5 was unique in being the only key action to have a dedicated research line to fund research in support of common policies. However, the relationship between research and policy is always hard to assess, especially within the realms of the Common Agricultural and Fisheries Policies (CAP and CFP) which underpin all agricultural, forestry, fisheries and rural development research carried out under the auspices of Key Action 5.

In this respect all 340 research projects funded will have some influence on policy in the sector but the 'support to policy' research line addressed very specific pre-legislative issues including scientific support for international trade discussions and settlement of disputes, tools to assess agricultural production, water use and protection of land with regard to CAP, and improved tools for the assessment of scientific projects regarding policy implications.

AG-MEMOD: A European supermodel

Projections examining the effect of change in EU agricultural policy have traditionally been general and country-specific in their approach and methodology. FP5 saw the launch of the AG-MEMOD project, bringing together 14 Member States to construct a modelling tool for forecasting policy impact on individual countries.

Teams in each country are working together to analyse and project farm product outcome, consumption, trade, prices and incomes. The results will allow policy-makers at all levels to assess policy impact and plan for the future with greater confidence.

The combination of parallel data from many different countries allows the measurement of change in individual countries in response to seemingly unrelated events.

The consortium, led by the Irish Agriculture and Food Development Authority, Teagasc, recently expanded market models to include olive oil, citrus fruits, potatoes, sugar beet, tomato paste and cotton.

Directing the directive

Professor Mårten Carlsson, recently retired Rector of the Swedish University of Agricultural Sciences and Nova University has a keen interest in policy-driven research and was impressed by the potential that EC-funded science had for influencing policy but recognised a need to track research over the longer term on policy implication.

"The Commission created well-formulated calls, influenced by the EAG, and put a great deal of energy into evaluation and follow-up. However, project administration should also focus on output and maximising value from research," he insisted.

Professor Carlsson felt strongly that researchers need more help in recognising the policy value of their work. People in specific areas of research are well placed to exploit the results of that research but lack of awareness concerning its impact outside their immediate research circle.

Policy made by the European Commission can often be perceived as not having significant scientific support, so it is critical that the EC is seen to refer to and be influenced by scientists when making contentious decisions. The wait for scientific results is often too long, far longer than the research actually takes because it is wrapped up in time-consuming funding processes and layers of national bureaucracy.

Professor Carlsson made the suggestion that Europe should have a central research capacity, not necessarily a single institute, to which it can turn for rapid answers to policy questions. Institutes across Europe could be accredited for short periods of time, perhaps three years, and when a specific answer is needed to a question, the Commission can turn to the appropriate institute for immediate, focused research.

For more information:

<http://europa.eu.int/comm/research/quality-of-life/ka5/en/00473.html>



Rural development

Rural areas make up 80% of Europe and the changes which are rapidly taking place within these regions are having a significant impact on local culture and economy. The structure of rural areas, both in terms of their industries and populations, has altered dramatically over the past 50 years and looks set to continue to do so.

As agriculture has peaked and started to struggle as a commercially viable sector in many Western European

countries, the continent has witnessed the fragmentation of previously extensive farming communities. This is a somewhat inevitable response to enhanced education and travel opportunities and a steady decline in farming incomes.

OMIaRD: Organic marketing initiatives and rural development



The surge in demand for organic food across Europe has created new and complex marketing challenges for producers – from small farms running vegetable-box schemes to large-scale co-operatives supplying supermarket chains.

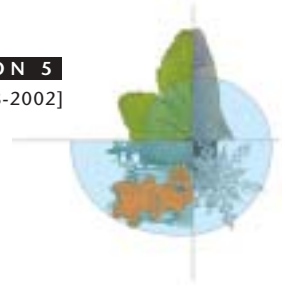
OMIaRD is a three-year, €3.3 million research project bringing together researchers from 19 European countries to examine all aspects related to the marketing of organic food. The project, which is being coordinated by the University of Wales, aims to develop new strategies that satisfy both environmentally and ethically conscious consumers and which will help create new jobs in rural communities.

Over the lifetime of the project, researchers will undertake a detailed analysis of 67 organic marketing initiatives (OMIs) in 34 European regions. The project will then link these case study regions to economic development issues, particularly their potential for job creation in rural areas. Four OMIs have been selected for in-depth study – Alce Nero, one of the oldest and most successful Italian organic co-operatives; BioBourgogne Viandes, a limited company formed in 1994 with approximately 100 producer shareholders in the organic meat market in France; Sulzberger Biobauern, a new co-operative venture in Austria's Voralberg region, which only processes organic milk produced by its 15 members; and Growing with Nature, a home-delivery service marketing locally produced seasonal organic vegetables in north-west Lancashire in the UK.

Researchers will also explore trends in consumer demands, examining attitudes to organic products and farming systems in Europe as a whole, with a focus on quality, ethical, social and environmental dimensions. The final part of the project will bring together all the research insights to provide practical marketing advice for organic producers in the EU. OMIaRD's first publication, *Analysis of the European marketing for organic food*, can be purchased from project partners.

For more information:

<http://europa.eu.int/comm/research/quality-of-life/ka5/en/31124.html>



The European Commission's Development DG defined the overall objective for rural development in all EU countries as one supporting 'a satisfactory trend towards the sustainable enhancement of rural population livelihoods in developing countries', with Key Action 5 seeking to provide research in support of this. Research was encouraged that gave greater understanding of changing rural situations and trends, the use of such knowledge to conceptualise integrated development of these areas, and then assess the impact of such development strategies.

Research funded as a direct response to such calls demonstrated the huge diversity that exists in approaching rural development. Research topics saw small cooperatives trying to build a sustainable economic model for rural communities; modification of land use away from standard food production; and an exploration of how non-food industries (such as wood harvesting) can support rural economies.

The right road or a dead end?

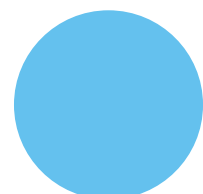
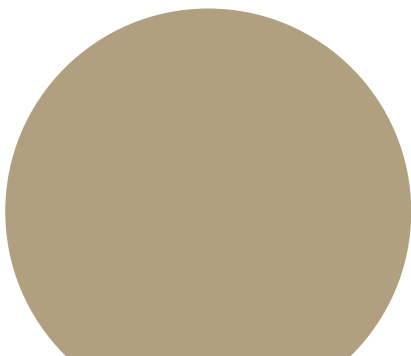
As Director of SUPRA, Scottish Universities Policy Research and Advice Network, Professor Joyce Tait is well placed to comment on the impact of Key Action 5 on rural development. "The broad approach taken by the Commission towards rural development is very good, although more

emphasis must be placed on interdisciplinary research if rural development is to really benefit," she explained.

Professor Tait believes some researchers understand the nature of interdisciplinary research and strive to undertake it while others still fail to see its value and do not know how to conduct such activities. "One major problem lies with institutional barriers – some in the EC – but most in universities and research institutions," she said.

"Our conclusion from a study of the Fifth Framework Programme as a whole, funded by the EC, was that in many cases in FP5 genuine interdisciplinary research was not carried out, although a great deal of learning has been achieved by all concerned – this learning should be built upon in the Sixth Framework Programme."

Synergy between disciplines will result in a stronger and more attainable rural development policy in the long term. Indeed, the Commission can point to some success in encouraging a holistic approach to Key Action 5 research for rural development as work here took into account factors such as transport, rural education provision, population demographics, and cultural history. However, individual projects cannot cover fully all the interactions that make up the complex issues of rural development.





Societal issues

The emergence of BSE, foot and mouth and other diseases inextricably linked to agriculture, along with the backlash against genetically modified crops, the decline in rural economies, overfishing, pollution, financial support for farmers across Europe, mean that agriculture and fisheries are high on the political and social agenda.

The Commission stated recently that “agriculture must be society-driven, responding to the demands of the consumer and citizen. It must be, and must be seen to be, of value to society as a whole¹.”

The most dangerous way forward would be to respond to fears grounded on a lack of good-quality information. Consumers are perfectly able to form an opinion about the food they eat, or indeed about agricultural practices and use of new technologies. Debate should be based on knowledge; decisions based on incomplete or misleading information will serve no one.

Science and society

“It is essential to bring science closer to society,” said Professor Fons Werrij, Chairman of the EAG. “Europe aims to develop a European Research Area and knowledge-driven economy but the gap between consumers and science is growing ever wider.” With a career spent working on communication in science, Professor Werrij knows the consequences of public misunderstanding. “The risk is that the Commission, through its Framework Programmes, responds to those who shout the loudest, funding research not in the public interest while issues important to food safety and the environment, etc., are ignored with negative long-term prospects.”

This opinion is shared by many in the EAG. Members are concerned that unless the gap in understanding between the research community and European citizens is narrowed, public opinion – driven by often misleading media coverage – will force research and the future development of agriculture and rural economies down the wrong road.

Many scientists in Europe, while brilliant in their own field, are not used to addressing societal issues that are inevitably linked to their work, and there was often a failure to understand requests from the Commission to include a social angle in their research.

Learning to walk

The first barrier to communication to be overcome is the language difference between laboratory or field-based scientists and social scientists. This would encourage coherent and truly integrated scientific communication and understanding of public response. As a scientist with PhD in molecular biology and Director of International Scientific Co-operation of Wageningen University and Research Centre, Professor Werrij is in the unusual position of being able to understand the importance of truly multidisciplinary research when looking to improve societal understanding of science.

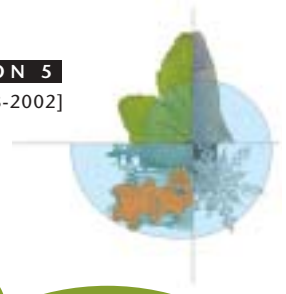
Professor Werrij observes that laboratory scientists structure their work in a very different way to social scientists and the two cultures are often alien to each other. Making a greater effort to cross the communication barrier between these

“It is ever more important to encourage truly interdisciplinary research as agricultural issues impact on all aspects of European society, from public health and food safety to industrial competitiveness, rural development and environmental protection. FP5 went some way to promoting such research, but the Commission needs to take it much further.”

Professor Joyce Tait



1. Summary of conference reports: “Agricultural Research in the ERA: A new vision to satisfy societal demand”: <http://europa.eu.int/comm/research/quality-of-life/pdf/agrisummaryconf.pdf> and “Science for Society – Science with Society”: <http://europa.eu.int/comm/research/agriculture/events/citizens.html>



Professor Fons Werrij

“The relationship between science and society must be addressed as a matter of urgency in agriculture – the gap is growing ever wider and the European Commission must look not at how they can change public opinion but WHY people hold a particular opinion. Only by understanding this can agricultural research have a closer relationship with the people and countries it serves.”

two research worlds is the first step in making science more accessible and relevant to European citizens.

Multidisciplinary values

The European Commission can play a key role in such a breakthrough dialogue. In Framework Programmes to date, research has been parcelled into distinct areas and targeted towards scientists in each particular area, including agriculture. Thanks to this targeting, it was highly unlikely that a social scientist would seek research opportunities in a proposal call entitled ‘Quality policy; agricultural products and farm-based products’ when, in fact, this particular area sought analysis of consumer expectations in FP5 and would have benefited greatly from multidisciplinary research.

Researchers in the natural sciences are used to collaborating across borders, but this is less true of workers in the social sciences. The communications barrier is raised higher by the Commission’s assumption that interested researchers will approach people across Europe to create a consortium. Moving science and the society it serves closer together is a great challenge and, according to the EAG, the European Commission could be more proactive in bringing together researchers from different fields to achieve this.

Running in the same direction

Once the cultural barriers between different scientific communities have been lowered, the foundations can be laid for strong interdisciplinary research that develops new technologies to the benefit of agriculture, the environment and consumers alike.

Science does not end with well-structured research projects. The results of those projects must be made available to all and not just accessible but actively disseminated through channels familiar to, and trusted by, consumers. It is a sad fact that after scares such as BSE, consumers have very

little trust in scientists.

Consumer groups are valuable independent sources of information, challenging scientists and politicians, and should be a central partner in communication. Trade bodies perform a similar role and must also be embraced as an essential link in the communication chain.

Policy-makers should also recognise their role in communicating science to society – the same language barrier exists between policy-makers in different departments and governments as between different branches of science. Greater progress will be made when such bodies work together rather than each in their own corner.

One size fits all?

There is no ‘one size fits all’ in communicating science. Many channels are open, and many sources of dialogue exist. Here subsidiarity reigns. What is traditional in one area of Europe would never be considered in others, even between close neighbours. The culture of each country will strongly influence, for example, how new products and technologies are received by consumers. Societal demands upon science will thus differ throughout Europe. Researchers must realise that the understanding or acceptance of any part of scientific advance cannot be taken for granted; they must work for an informed dialogue with those who pay for the work.

The new Sixth Framework Programme offers a structure which explicitly requires full inclusion of social science as an essential part of research projects. Both the European Commission and scientists of all disciplines must take the opportunity and realise the need to help the consumer understand the nature and the real risks and values of scientific advance.



Dissemination and exploitation of results

Dissemination and exploitation are pivotal in transforming research results into improved policy, better end products, new processes, enlarged services for consumers, and improved applications for industry. Both dissemination and exploitation activities are integral parts of the funding Framework Programme projects. How has this worked in Key Action 5? It is too early to comment in detail on the full exploitation of research results within KA5 – of the 320 RTD projects funded, only a handful have completed their contract. The EAG cannot comment directly on exploitation of results from the Fifth Framework Programme at this early stage. But they have witnessed, both as EAG members and researchers, the extent of dissemination from related research in past Framework Programmes such as FAIR and AIR.

Industrial members of the EAG were well placed to comment on exploitation. Dr Ernst Rasche, of Bayer CropScience, Germany represented large agro-industry concerns on the EAG and has participated in many previous Framework Programmes. He was concerned that the scope for technology transfer in FP5 was more limited than in previous programmes, particularly with respect to

demonstration projects. These are attractive to industry and bring together academic research, which has achieved its first objective, and commercial partners who can see that work turning into an appli-

cation. Dr Rasche observed that the demonstration opportunities in FP5 had unfortunately declined from those featured in FP4.

Biotech tools

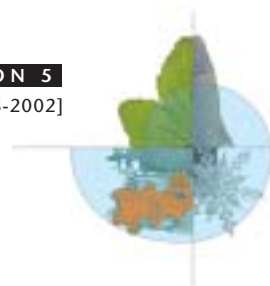
Biotechnology could be a powerful tool to improve production systems; however, a lot of research in Europe remains at the institute or university level and is several years away from hands-on 'farmyard' application. Dr Rasche saw industry as the key link between this high-level research and new products and processes. Companies are ideally placed to identify research projects with good commercial potential and have systems in place to develop projects from early-stage research to full commercial application. "Industry should be more involved in defining initial research projects and research gaps as it has many years of experience in knowing what will transfer successfully to the agricultural, forestry and fisheries sectors," said Dr Rasche.

Dr Finn Rexen of the Danish Ministry of Food agreed that more emphasis should be placed on industry for exploitation of EU results. His work in assessing industrial interest in agricultural technologies being transferred out of academia has established that companies, particularly SMEs, are excellent conduits for research. While they may not wish to be involved in high-level research, they can see development and commercialisation potential that adds value on several levels – to research funded by the Commission, their own commercial development and, last but not least, to the European industry as a whole.



"The European Commission had a tendency to react strongly to public opinion in shaping FP5 when, in many cases, it would have been wiser in the long term to provide independent leadership. The EAG was critical in ensuring that agricultural forest and fisheries research objectives addressed actual needs; these may not have been as high profile as topics in the public eye but they serve the long-term development of agriculture, food production and environmental protection."

● Dr Ernst Rasche



Conclusion

Key Action 5 – a success for European agriculture, forestry and fishery research?

Did Key Action 5 deliver value for money and will Europe as a whole benefit from that research?

○ **Plant research** – Key Action 5 recognised the importance of biotechnology in crop research, using it as a tool to improve a plant's innate health and own defence mechanisms in the fight against disease.

The EAG considered carefully the plant biotechnology projects and the public perceptions of such work. Having weighed all the evidence, the group was keen to see plant biotechnology put to greater use, particularly in work on transgenic crops. It was aware that if the EC bows to the media-fuelled opinion on the matter, consumers in Europe will never have the opportunity to judge such technology on a fully informed basis. This must be placed in the wider context of the European Commission's long-term strategy to develop Europe's life sciences and biotechnology industries¹ and the Commission's application of the precautionary principle² – which states that even in cases where scientific uncertainty exists but the best available evidence shows there are potential risks to the environment, human, animal or plant health, even if the risk is not proved, action must be taken to prevent it.

The EAG considered that there was mostly an adequate balance between the various types of crop research work although a little too much emphasis was placed on organic systems at the expense of science-based low input systems. The EAG felt that these are more feasible and appropriate low-input systems, which offer sustainability alongside improved food production and economically viable farms.

EAG concludes that the Key Action 5 was a step in the right direction for crop research. The Commission did not shy away from addressing controversial issues and sought to improve technologies underlying crop health and production.

○ **Animal research** – The focus was on fighting disease and improving animal health by applying cutting-edge science – for example, in the use of the relatively new area of genomics – and by improving animal welfare strategies. This twin-track approach brought success that will result in animal health improvements throughout the food chain. The lessons learned will also be valuable to the Sixth Framework Programme's food quality and safety priority action which specifically aims to stimulate scientific-led improvements to the entire food production chain.

○ **Non-food research** – Although a broad spread of applications for alternative uses of land was encouraged, the EAG felt that the level of innovation in non-food research was low with few genuinely novel projects being submitted or funded. This highlights a broader problem across Europe concerning a fear of new technologies. Key Action 5 provided valuable input by highlighting what needs to be done in this area.

A higher profile for non-food use of agricultural resources is a major requirement, encouraging researchers to invest in more innovative projects while, just as importantly, making this sector economically attractive for commercial investment. A potentially lucrative market exists here and Europe needs to capitalise on the research skills and entrepreneurial drive it has within its borders.

¹ 'Life sciences and biotechnology – a strategy for Europe' (COM 2002 27) http://europa.eu.int/eur-lex/en/com/cnc/2002/com2002_0027en01.pdf

² Communication on the Precautionary Principle, etc. http://europa.eu.int/comm/dgs/health_consumer/library/pub/pubo7_en.pdf



Key Action 5 was committed to bringing commercial success to non-food research activities, and many scientists have made the transfer of results to industry a priority in their work. However, as Key Action 5 has only just finished it is too early to say what the long-term impact will be.

- **Forestry** – Key Action 5 continued the investment in forestry development seen in previous Framework Programmes although, in the opinion of some EAG members, it placed too much emphasis on high-tech solutions when the industry should be taking a step back and looking at wider community and environmental issues in the sector. The fear was that the reduced levels of funding for such critical areas of research would lead to the perception of lower scientific value of such work. The lack of funding to demonstrate research applications within Key Action 5 was also a problem, resulting in less industrial participation and not enough transfer of research into practice.

- **Fisheries and aquaculture** – Unlike forestry, the EAG wanted to see more biotechnology applications in fisheries research, recognising that politicians have woken up to the consequences of the fishing crisis and that the EU must move rapidly, using all the tools at its disposal to restore and preserve fish stocks in order to achieve sustainable exploitation. Overall, KA5 was felt to have used its funding wisely, concentrating hard to improve sustainability and fish stocks and developing aquaculture as an industry that fits within local ecosystems. The only real area of weakness was the lack of attention to the gaps between fisheries research, and the needs of fishermen and the general public. All parties must be involved in research if the

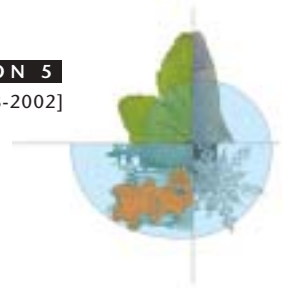
future of fisheries as an industry, and as an ecosystem, is to be secured.

Fisheries research in Key Action 5 was heading in the right direction but would be enhanced through the involvement of a broader spectrum of parties influencing and administering fish stocks in European waters.

- **Support for policy** – It was agreed that Key Action 5 had enormous potential to produce research and results that could influence policy. The breadth and depth of research ensured that policy-makers would not lack solid science to underpin agricultural policy. However, this may fail to reach policy-makers' ears and the European Commission should strive to make researchers more aware of the value of their work in underpinning policy, ensuring that an open channel exists between researchers and policy-makers at a national and European level.

Key Action 5 had all the ingredients to provide policy-makers with excellent advice and the Commission must make the most of such a valuable commodity.

- **Rural development** – Such a broad and complex topic was never going to be addressed by research carried out within the agricultural sector alone. While Key Action 5 funded some worthy projects, it was never truly multidisciplinary enough to have a significant impact on rural economies and policies. Future research in this area must, according to the EAG, look to a wider combination of research sectors if it is to be of benefit to both rural society and industry.



Looking to the future

FP5 finished in 2002 and the Sixth Framework Programme for research is now under way. So what impact did research in Key Action 5 have on the research priorities selected under FP6? Perhaps the most obvious difference between the two programmes is that in the latter, agriculture, forestry, fisheries and aquaculture no longer exist as distinct scientific areas. Instead, the European Commission is addressing specific agricultural issues that have a significant impact on consumer health and the economy. For example, where FP5 covered food safety and agricultural production in two entirely separate Key Actions, FP6 takes a wider view and recognises that food safety is a 'fork-to-farm' matter – with good agricultural practice at all stages of production influencing food quality.

With this new approach, the Commission is addressing public anxiety about the quality and safety of food production in the wake of problems such as BSE, salmonella and dioxin entering the food chain. The food quality and safety thematic priority will provide a scientific basis for developing an environmentally friendly production chain of healthier, safer and more varied foods for Europe's consumers. The fork-to-farm approach will harness the new FP6 instruments (Integrated Projects and Networks of Excellence) to develop multi-partner research projects. Potential areas of study include: the epidemiology of food-related diseases and allergies; how food affects people's health; improving food traceability; analysis and detection of contaminants; and the impact of animal feed on human health.

Fons Werrij believes the new approach has merit in terms of using advances in science. "If you look at FP6 you can see some aspects of agricultural research are well covered, such as food safety, genomics and biotechnologies," he said. However, Professor Werrij believes that the process of agricultural research development – which provides the scientific community with a growing knowledge base linking issues such as food production, landscapes, conservation, and rural/urban interactions – is somewhat missing from the new approach. "The employment of modern technologies to adopt food quality to the wishes of the consumer is fine, but I would like to see more linkage with social sciences. Key Action 5 was a good attempt to connect social and cultural development in society with scientific innovation, but the FP6 approach does not have this coherence."

The European Commission will continue to take on board this kind of independent scientific opinion during FP6. An 'Advisory Group' has been set up to guide the Commission on the overall strategy to be followed in carrying out the food quality and safety thematic priority. The Group has 26 new members and is chaired by Professor Tiina Mattila-Sandholm from VTT Technical Research Centre in Finland. It will work in much the same way as the FP5 EAG and will advise the Commission on all aspects of funded research. It will also be instrumental in helping the Commission to revise its annual work programme in order to make sure the overall food quality and safety research objectives set out in FP6 are successfully achieved. The Advisory Group's reports will be accessible on the Commission's Research Directorate-General's website.



For further information

For European Union-funded agricultural research see the EU Agrinet website:

http://europa.eu.int/comm/research/agriculture/index_en.html

The above site offers a facility for obtaining publications related to EU-led research on the following page:

http://europa.eu.int/comm/research/agriculture/useful_publications/publications.html

For an overview of the European Commission's research activities, log on to:

http://europa.eu.int/comm/dgs/research/index_en.html

Details about research into food quality and safety in the Sixth Framework Programme can be found under this link:

http://europa.eu.int/comm/research/fp6/p5/index_en.html

The Directorate-General for Agriculture is available at:

http://europa.eu.int/comm/agriculture/index_en.htm

General information about the role of External Advisory Groups in FP5 is available at:

<http://www.cordis.lu/fp5/src/eag.htm>

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