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COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

Towards a coherent strategy for a European Agricultural Research Agenda

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1. A NEW CONTEXT FOR AGRICULTURAL RESEARCH IN EUROPE

1.1. The legal basis for EU action

Regulation (EEC) No. 1728/74 of the Council of 27 June 1974 stipulates in Article 11 that *"at regular intervals the Commission shall present to the European Parliament and to the Council a report on the coordination of agricultural research"*. The aim of this report is to provide an overall picture of developments in agricultural research within the Community and to identify strategic actions *"which would be desirable in agricultural research in the Member States and in the coordination of that research at Community level, with reference to the aims of the Common Agricultural Policy"*.

Article 7 of the abovementioned Regulation establishes a Standing Committee on Agricultural Research (SCAR), consisting of representatives of Member States (MS), who have a mandate to advise the Commission and the MS on the coordination of agricultural research in Europe.

The content of this Communication and the accompanying Commission Staff Working Document is based on the outcome of the various initiatives undertaken by the SCAR Committee over the past four years to identify trends and needs in this sector. It is also based on the results of a European Commission-funded "EU-AGRI-MAPPING" project, which has analysed the status of agricultural and food research in Europe[1].

1.2. New challenges for European agriculture

The farming demographic in the EU is changing, the number of farmers decreases while available land remains constant. The age of the farming labour force increases, and there is a lack of diversity away from production, yet the socio-economic and environmental importance of agriculture remains. The combined agri-food sector is still a key employer and generator of wealth (900 billion € turnover, 20 million employees) and agriculture is still the key land use mechanism and plays the central role in the social fabric of rural areas.

The implications of modern farming practices, particularly in EU 12 countries, could result in increased unemployment as farms go from small to large scale, and research should not ignore the resulting socio-economic challenges.

The process of reforming the Common Agricultural Policy (CAP) continues to drive change in farming. Since the first major reform in 1992, EU agriculture has been forced to meet the challenge of increasing competitiveness against the backdrop of the potential negative environmental impacts of modern production methods. Agriculture has also had to respond to the increase in consumer concerns about and awareness of food safety, quality and affordability and, more recently, to the growing demand for a healthier diet.

While availability of food supply at reasonable prices to the consumer is still crucial, the Agenda 2000 reforms introduced the link with sustainable development. The 2003 reform package broke the link between public support and production and the introduction of cross-compliance with EU legislation regarding farm production methods. The result of this has been to bring market orientation into line with environmental and other production standards, as key determinants for the sustainable future of the EU farm sector.

[1] www.agrifoodresearch.net/library

Moreover, the Second Pillar of the CAP has shifted the EU policy framework towards rural development. This has enabled it to provide more opportunities to target support to specific priorities of societal importance, such as the protection of the environment and the enhancement of quality of life in rural areas as well as a range of non-commodity outputs produced by agriculture such as access, recreation, conservation, amenity, heritage and tourism.

Throughout this reform process, external global drivers have also changed EU food and farming. We have seen the demand for food increasing due to a rising world population, increased efforts to reduce malnutrition, and a rise in livestock consumption linked to the growing wealth of third countries and increased international trade. The EU is now the largest global agricultural importer and exporter, and is by far the largest market for developing countries.

In addition, EU agriculture is facing a wide range of new future challenges, which include: further globalisation, tightening of energy supplies, climate change, unsustainable consumption of natural resources, and the recent rise in food prices[2].

1.3. Need for action at EU level towards a renewed Agricultural Research Agenda

In order to cope with these challenges, it is widely acknowledged[3] that there is a need for a strong agricultural research area within Europe. Agricultural research should provide the knowledge that is necessary for a thorough understanding of rural development, of the drivers and impediments for sustainability, and provide the new technologies and innovation needed for the development of the agricultural sector.

Scientific support to policy, using results and expertise originating from the research community, is playing an increasing role in the identification of the economic, environmental and social consequences of any possible policy intervention. This is in line with the Commission's commitment to delivering "Better Regulation" and, in particular, to providing high-quality impact assessments.

However, in response to these societal demands, and even though European agricultural research encompasses a broad spectrum of disciplines and stakeholders, research efforts often remain fragmented and poorly coordinated; there is underinvestment and a lack of critical mass. In many situations, no single Member State has the full resources or capacity to carry out the necessary research and policy developments alone.

In Europe, several mechanisms are in place, particularly under the EU’s Framework Programme, which help to foster pan-European collaboration between researchers. Accordingly, increasing cooperation between national research programmes, especially at the level of national funding, is an intrinsic priority in the creation of a European Research Area

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2 "Strengthening agricultural research and related knowledge generation" is one of the actions considered by the Commission COM(2008) 321 final "Tackling the challenge of rising food prices - Directions for EU action"

3 Ref. SCAR Foresight; World Development Report 2008; Intergovernmental Panel on Climate Change (IPCC reports); Millennium Ecosystem System Assessment

(ERA). In this respect, the ERA-NET scheme[4] provides funding for the networking of national programmes, ministries or funding agencies across all scientific sectors.

Although several ERA-NETs of relevance to the area of agricultural research have been launched, the EU Council agreed (in November 2004) that collaboration in this area would benefit from a more structured approach, and that SCAR should investigate the issue further.

In this respect, the recently devised concept of Joint Programming[5] goes a step further than the ERA-NET scheme and elicits the direct cooperation of Member State public programmes in defining common visions, strategic research agendas, and the pooling of resources to tackle specific areas together. Some major societal problems in Europe that are linked, for example, to climate change, the energy crisis or food supplies would benefit in particular from a critical mass of public research efforts, as identified in the conclusions of the informal Competiveness Council meeting on 17-18 July 2008 in Versailles.

The SCAR Committee was mentioned as a good example of a possible network structure in any new Joint Programming process.

2. THE STEERING ROLE OF THE SCAR COMMITTEE

2.1. A renewed mandate

Following several dormant years, the Standing Committee on Agricultural Research (SCAR) was given in 2005 a renewed mandate by the Council of the EU to play a major role in the coordination of agricultural research efforts in Europe. The "new" SCAR is made up of the 27 EU Member States, with representatives from Candidate Countries and Associated Countries as observers.

It works to a wider and more up-to-date definition of the term 'agricultural research', looking beyond the narrow confines of research relating to production and embracing the so-called 'fork-to-farm' concept, emphasising research for sustainable agriculture, and including non-food uses, biodiversity, forestry and rural development. Adopting a holistic approach, SCAR will address major issues within the concept of a European Knowledge-Based Bio-Economy (KBBE)[6]. These would include animal health and welfare, zoonoses, consumer and health issues relating to the quality, safety[7] and security of food production and supply; issues of consumer confidence and consumer behaviour towards food, nutrition, retailing and markets, as these impact on agro-food research, and issues related to developments in non-traditional and non-food areas of agriculture activity.

Moreover, the informal Agriculture Council of Ministers (Krems, 28-30 May 2006)[8] recommended that "in the framework of the Lisbon Strategy, the SCAR Committee should invite EU MS to include questions of advisory services, education, training and innovation in

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4 Article 169 of the EC Treaty enables the Community to participate in research programmes undertaken jointly by several MS and is intended for topics of high political visibility and relevance

5 "Towards Joint Programming in Research" COM(2008) 468 final, 15.07.2008

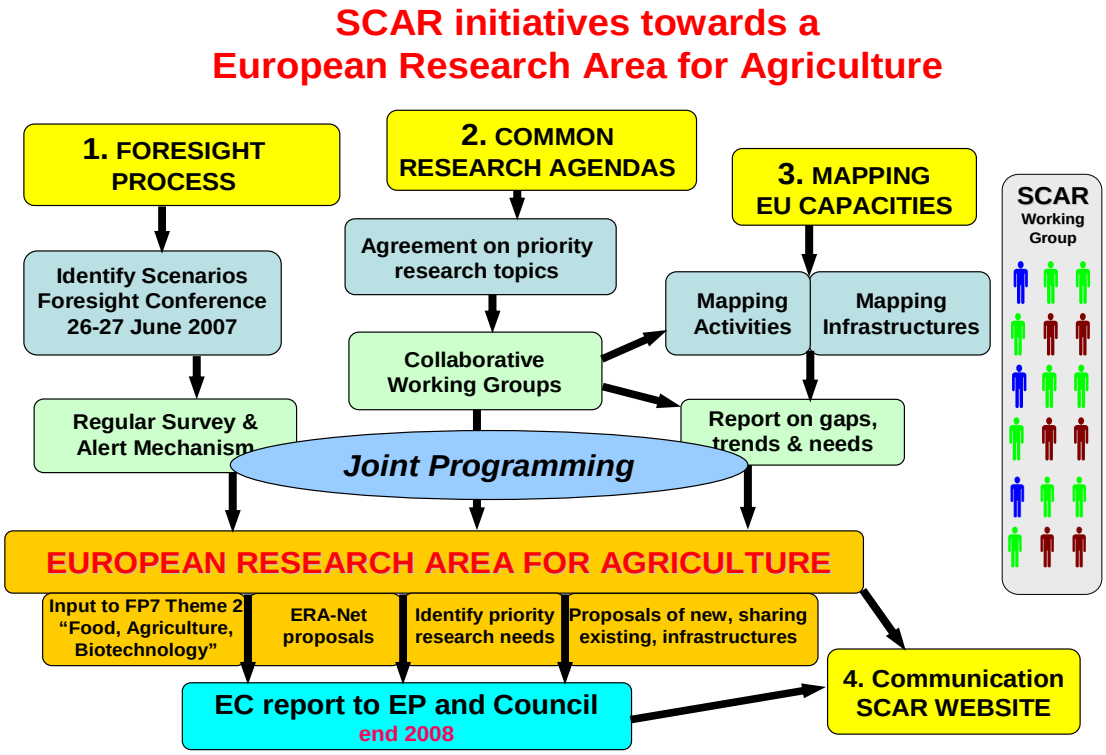
6 Fishery research is not included here because this sector has its own established coordination mechanisms at European and international scale

7 Taking fully into account the mandate of other bodies such as the European Food Standards Agency and its own committees

8 Presidency Conclusions, 16 June 2006

their discussions", in line with the requirement to ensure that the effective use of the research results are consistent with the needs of a changing CAP.

In that context, the SCAR Committee has taken coordination actions forward on a number of fronts to provide vital inputs into all research areas of the KBBE and to build a European Research Area for agriculture.



2.2. Towards common research agendas

Building on a survey of agricultural research coordination at European level carried out under the Netherlands' Presidency in 2004[9], SCAR adopted a structured approach to the prioritisation of research topics for further collaboration, through the establishment of a number of Member/Associated State Collaborative Working Groups (CWGs).

The establishment of CWGs is a more flexible and less formal alternative mechanism to the ERA-NET scheme, but shares the same objective: to stimulate and ultimately increase research collaboration between funders and programme managers on key-research areas. Since 2005, fourteen CWGs have been set up by European countries engaging voluntarily and on a variable-geometry basis in the definition, development and implementation of common research agendas based on a common vision of how to address major challenges in the field of agricultural research.

9 "Towards cooperation between research funders and programme managers in the domain of Agriculture, Food, Rural Development and Fisheries in the European Union" - Report written for The Netherlands Ministry of Agriculture, Nature and Food Quality

CWGs work in a similar way to ERA-NETs, in that they follow the same step-by-step approach – focussing on information exchange during the early stages, identifying gaps in research and priority areas for collaboration and, where applicable, launching joint activities and/or common research calls.

It was the dynamism and commitment of several CWGs that paved the way for participation in the FP7 ERA-NET scheme, with five CWGs declaring their intention to submit proposals in the first calls for proposals (as illustrated in the table below).

CWG Title	Coordinator	SCAR countries
ICT and Robotics in Agro-Food Industries => ERA-NET PROPOSAL "ICT-AGRI"	Denmark	11
Renewable Raw Materials and their Applications in Non-Food Industry	Germany	18
Sustainable Livestock Production from Grasslands	Ireland	21
Relevant Issues for Mediterranean Agriculture => BECAME AN ERA-NET "ARIMNet"	Italy/France	13
Agriculture and Sustainable Development => ERA-NET PROPOSAL "RURAGRI"	France	11
Animal Health => BECAME AN ERA-NET "EMIDA" Animal Welfare started as a CWG	UK	21
Advanced Technologies for Climatic Control of Greenhouses and Livestock Housing	Israel	14
Adaptation of Human Nutrition to Environment Evolution	France	10
Ecology for Ecosystems & Natural Resources Sustainable Management	France	8
Development of Sustainable Agriculture in the Baltic Sea Region	Poland	8
Common research agenda for EU rural policy => ERA-NET PROPOSAL "RURAGRI"	Sweden/Netherlands	7
Climate Change and Agriculture	Spain	22
Agriculture and Energy	Germany	21
Shared Infrastructures in the field of Agricultural Research	France	15

2.3. A foresight process

The SCAR has initiated a foresight exercise to formulate possible scenarios for European agriculture over the next 20 years on which to base the prioritisation of agriculture-related research in Europe in the medium-to-long term. This process was strongly encouraged by the informal Council of Agriculture Ministers (Krems, 28-30 May 2006).

Accordingly, the European Commission established a Foresight Expert Group (FEG) to gather and analyse foresight information available in national, regional and international studies with respect to eight major drivers[10], to use this information in formulating future

[10] Climate change, environment, economy and trade, energy, societal changes, science and technology, rural economy and health

scenarios[11] and to carry out an initial assessment of the implications for the RTD requirements of European agriculture.

The reports from the FEG were disseminated among relevant stakeholders and discussed, together with other foresight exercises, at the Workshop, *"Foresight to Set Long-Term European Agricultural Research Priorities"*, which was held in Stockholm on 29-30 March 2007 and which brought together high-level experts and stakeholders to reflect on the research needs arising from the foresight analysis.

The views expressed and the conclusions drawn at the workshop were used, together with the FEG reports and further stakeholder consultation, as a basis for a major international Conference *"Towards future challenges of Agricultural research in Europe" (26-27 June 2007)*[12]. This marked a major success in establishing a platform for the discussion of foresight in relation to long-term European agriculture research needs.

The conclusions of the Conference on possible actions towards a coherent European Agricultural Research Agenda were taken into account to a large extent in the drafting of the present Communication (chapter 3).

2.4. Mapping EU capacities

The SCAR Committee is also involved in the mapping of EU agricultural research capacity through the European Commission-funded "EU-AGRI-MAPPING" project, which has analysed the status of agricultural and food research in Europe and identified trends and needs in this field. By providing key numbers/statistics on the national organisation of agricultural research and an overall picture of developments in agricultural research within the EU, the project has contributed to the assessment of desirable developments in agricultural research in the Member/Associated States and in the mechanisms needed for better coordination at EU level.

The issue of research infrastructures was considered to be a priority in the framework of SCAR's strategic discussions. In 2005, SCAR sent a note to ESFRI (European Strategy Forum for Research Infrastructures) on the issue of very large infrastructures of relevance to agriculture[13]. This was an attempt to raise the profile of agriculture research infrastructures in the ESFRI discussions, and to provide examples[14] of the large research facilities that might be needed in this area.

In addition to the large-scale infrastructures for research, SCAR has highlighted the strong demand for networking of distributed facilities and clusters of expertise, and for their effective management. In this respect, a new CWG in the area of "shared infrastructures for European agro-food research" is being set up to identify future needs, and to design new governance models for sharing infrastructures efficiently on a European scale.

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11 Disruption scenarios: Climate Shock, Energy Crisis, Food Crisis, Co-operation with Nature

12 http://ec.europa.eu/research/conferences/2007/scar/report_en.htm

13 SCAR note to ESFRI, "Research infrastructures required in the field of agricultural research", 31 August 2005

14 Genetic and biological resource centres including collections for plant and animal diseases - Agriculture, Forestry and environment observatories - Human nutrition research centres - Advanced, integrated experimental facilities for infectious diseases

Lastly, a dedicated website provides a complete and regularly updated picture of the national agricultural research systems in all SCAR countries[15].

3. KEY ACTIONS TOWARDS A COHERENT EUROPEAN AGRICULTURAL RESEARCH AGENDA

3.1. Towards a more sustainable agriculture in the global context

While the Commission's Communication did not specifically identify areas of research for Joint Programming, the aspect of food security and production was used as an example at the Versailles informal meeting. This is because it is becoming increasingly evident that the sustainable management and use of biological resources is a major societal issue and one that involves a range of inter-linked challenges, including climate change, environmental degradation, consumer demand, and global stability.

Before long we will be at risk of passing critical thresholds, with far-reaching consequences for all ecosystems and hence for agriculture and food security. Accordingly, the International Panel on Climate Change (IPCC) expects agricultural production in Africa to fall by half in 2030, with serious consequences not just for food security and the vulnerability of fragile regions, but also for global security. Rising fossil fuel prices in the long term may drive up food prices, as all phases of production, processing and distribution are highly oil-dependent. Crops grown for fuel and other industrial commodities, and the corresponding shifts in production, could have serious implications. In addition, population growth and changing diets in the emerging economies will require more food production, but with the corresponding risk of environmental impacts if unsustainable systems are deployed.

There is thus a corresponding and urgent need to acquire a much better understanding of the driving forces underlying these processes in order to reduce adverse impacts of climate change and safeguard the dwindling resource base of soil, water, and biodiversity. Such an approach will require the necessary research capacity, technology transfer, and multidisciplinary skills from a wide-ranging sector of economic, social and ecological interest.

3.2. New priority areas for the future Agricultural Research Agenda

New emerging challenges require targeted responses from appropriate priority research areas for the future Agricultural Research Agenda.

The foresight process initiated by SCAR and the conclusions from the June 2007 Conference highlighted the importance of a number of topics, such as biodiversity, organic farming, food safety, global food security, integration of environmental technologies, biotechnology, emerging animal diseases, as well as emerging plant pests and diseases. In addition, it was remarked that the interface between agriculture, climate change and energy constituted a major societal challenge that deserved to occupy a more prominent place on any future research agenda.

This trend was strongly endorsed by the European Council of 20 June 2008[16] which stated that "*there is a need to pursue innovation, research and development of agricultural*

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15 http://ec.europa.eu/research/agriculture/scar/index_en.cfm

16 Presidency Conclusion n° 28 of the European Council, 20 June 2008

production, notably to enhance its energy efficiency, productivity growth and ability to adapt to climate change."

- ***Climate change*** is one of the main threats to sustainable development, and represents one of the greatest environmental challenges, adversely affecting the global economy, health and social welfare. Climate change can affect crop yields, livestock management and the location of production. It can also have important consequences for farm income, land use and rural economies in certain parts of Europe. The risks of climate change are being actively addressed by the "Health Check" of the CAP, and it has also become an issue for European national research programmes, which are looking into improved agricultural practices that will help the agricultural sector to adapt and mitigate the impacts of farming on the climate. In this context, it has also underlined the complexity and importance which continued research into soil management practices can have in maintaining or increasing soil organic matter levels across the EU. Soil organic matter plays a crucial role not only in the carbon cycle, but also in supporting soil fertility, improving soil structure, and increasing water retention, thus providing resilience to climatic stresses. The Commission's Green Paper *"Adapting to climate change in Europe – options for EU action"* indicated that adaptation policies are emerging in nearly all MS, and that it is essential to share experiences from early adaptation actions and research results .

- ***Energy*** There is a growing global demand for food and for alternative energy sources from biomass in a world where water and land resources are in short supply, while increasing soil degradation and rising temperatures are impairing the productivity of the land. This challenge requires development of agricultural technologies and adjustment of energy and agriculture policies, underpinned by appropriate research support measures at the agriculture-energy interface. Particular attention should be paid to the effects of biofuel and biomass production on water quality, soil organic matter and biodiversity.

Climate change and energy issues in relation to agriculture were actually identified as priority areas by the SCAR foresight activity and recognised as a significant gap in the coordination of research at European level. Two new CWGs on these issues are currently being launched, each involving more than 20 European countries. The first will consider how climate change affects agriculture, and how agriculture can suitably adapt to and mitigate these effects. The second will address the interface between agriculture and energy in a broad holistic sense, ranging from the scientific-technological challenges for biomass and bio-energy production to the industrial, ecological, socio-economic and rural dimension impact.

3.3. Strengthening the production and sharing of agricultural knowledge in Europe

The mounting challenges facing the agri-food and rural sectors in Europe calls for a review of the links between knowledge production and its use to foster innovation, as clearly indicated by the key messages from the foresight process and the June 2007 Conference.

Research could play a stronger role if different actors (farmers, researchers, advisory services, consumers, private sector, civil society, policy makers) were better integrated in actual agenda setting and became part of the research process through actions such as innovation networks. At the same time, agricultural research needs to become more innovative, and it needs to find ways to attract the "best" science and technology personnel into the sector.

The workshop *"Strengthening the links between knowledge and innovation in Europe"* on 6-7th October 2008 in Angers provided an opportunity to identify the key features of a European

agricultural knowledge system. The workshop reviewed how the links between knowledge and innovation are organised in Europe, analysed the motives and arguments for such an organisation, and how shared experience from important reforms in several European countries can lead to potential "best practices".

The Commission intends to make use of SCAR to identify agricultural knowledge structures in each Member State, with a view to eventually creating a corresponding CWG.

In this context, the European Network for Rural Development, as laid down by Article 67 of Council Regulation (EC) No 1698/2005, is a suitable forum to address technology transfer, as part of the improved implementation of rural development programmes. The Commission is currently assessing the possible ways to feed “Research and innovation” into the agenda of the network, notably in a 2009 seminar looking at innovation for the new environmental challenges.

Furthermore, since advisory and extension services are likely to play a significant role in the development of any future European agricultural knowledge system, the Commission intends to take into account the findings of SCAR in its report on the Farm Advisory System, which has to be submitted to Council by 2010.

3.4. Consolidating joint research programming for better governance of the European agro-food system

In the light of the ERA-NET scheme, MS have started to rethink previously isolated national approaches towards new cross-border challenges in all research fields. In addition, the Commission's Communication *"Towards Joint Programming in Research"* foresees a new impetus towards a more strategic approach to coordination and collaboration in the programming of public research within the ERA.

The Council is currently reflecting on this new approach and will decide on the process for identifying the research sectors that are suitable for future Joint Programming Initiatives. In this respect, the informal meeting of the Competiveness Council, held on 17 July 2008 in Versailles, cited food and agriculture as one of four main challenges facing society today.

The SCAR Committee, which has proved to be the *de facto* reference framework for a more coordinated approach to programming of public research in agriculture, was also mentioned as having an important role in any new related Joint Programming process.

The development of effective and coordinated long-term programming in agricultural research should be based on a coherent strategy and organisational framework that will allow a regular consultation of all research actors as part of the wider Ljubljana process for governance of the ERA.

Accordingly, the strategic role of SCAR could be further strengthened so that it can become the strategic oversight body supervising the various agriculture-related efforts carried out by all European public research bodies. It could also facilitate dialogue with related stakeholders in Technology Platforms who are involved in defining common visions and strategic agendas in similar research fields.

3.5. Developing a mechanism for foresight monitoring

Long-term research agendas based on common visions and shared objectives must be developed through a strategic combination of analytical tools such as foresight studies, collective expertise, and mapping of research capacities, and should deliver evidence-based results to guide agricultural research policy.

The experience gained through the SCAR foresight process has shown the importance of and need for an early warning system that allows policy makers and researchers to clearly anticipate the challenges and problems that we may face in the years to come, and to suggest ways of tackling them.

The design of this mechanism is currently being further developed to verify the adequacy and validity of previous and emerging foresight studies, and will provide a systematic approach for identifying potential threats, opportunities and likely major future developments and their implications for the ERA agenda. It will also highlight the possible implications of such developments for the future orientation of research policy at European and Member State levels.

The mechanism is currently in an experimental set-up phase, following the formation of an expert group of consultants tasked with updating the first foresight study and defining indicators and criteria that may form the basis for the review, at regular intervals, of the long-term challenges and objectives.

3.6. Europe's responsibilities in a globalised world

In a world whose population is forecast to reach around 9 billion by 2050 and which is increasingly economically integrated and affected by climate change and environmental degradation, agricultural sustainability is becoming an issue that will have both a direct effect (e.g. through food prices) and an indirect effect (e.g. through migration) in the EU, as well as on all regions of the world. Future agricultural sustainability in Europe and in the Developing & Emerging Economy Countries (DEEC) largely depends upon the stability of key resources such as farmland, water and functioning ecosystems. European research has the capacities and the obligation to contribute to advancing the understanding of the complex interplay of factors at stake.

Moreover, another major driver of the increasing degree of convergence of agricultural research in both DEEC and European Countries is the growing importance of research domains where there is no longer any scientifically valid distinction between North and South. It is on this basis that a better integrated European agricultural research policy involving international cooperation needs to be built and to be promoted by the Commission.

Therefore, in line with the new Commission Communication on the Strategic European Framework for International S&T[17], policy synergies in the area of agricultural research within and outside Europe must be strengthened. In particular, there is a need to enhance synergies between EU and Member States' research policies, on the one hand, and external policies such as development aid and neighbourhood policies on the other. In addition, Europe should take a leading role in helping to define a global agricultural R&D agenda, in collaboration with international organisations (UN agencies, World Bank, OECD, G8) and

[17] COM(2008) 588 final, 24.09.2008

multilateral organisations (African Union, ASEAN, Mercosur), together with bodies involved in global agricultural research, such as GFAR[18] and CGIAR[19].

In this context, the international mandate and leading role of SCAR could be further strengthened with contributions from the European Initiative on Agricultural Research for Development[20] (EIARD), which should reinforce its coordinating role of Commission and MS supports to agricultural research targeting the needs of DEEC, and from ongoing ERA-NETs such as *ERA-ARD*.

[18] Global Forum on Agricultural Research

[19] Consultative Group on International Agricultural Research

[20] COM(97)126 "The European Initiative for Agricultural Research for Development (EIARD)"