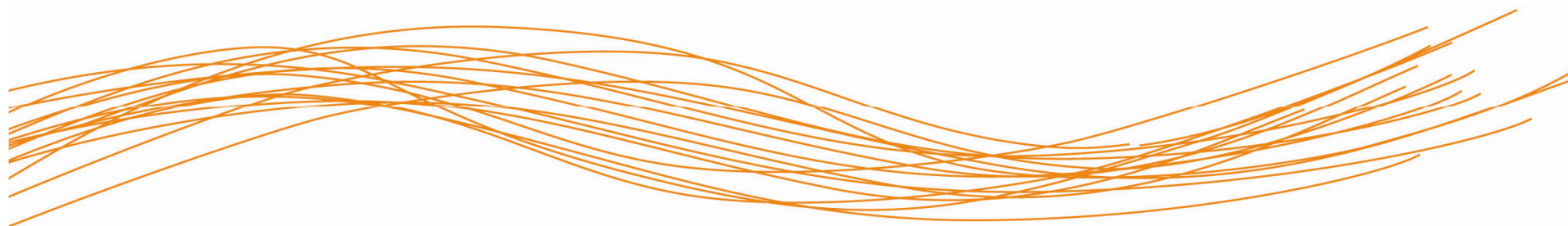




The EU support to research on the Knowledge-Based Bio-Economy



Leibniz Gemeinschaft Information Session
on Agricultural Research

Brussels, 28 November 2007

Timothy Hall

Directorate Biotechnologies, Agriculture and Food
Directorate-General for Research
European Commission



The Bio-Economy

The Bio-Economy: Includes all industries and economic sectors that produce, manage or otherwise make use of biological resources including bio-waste.

The European bio-economy has an approximate market size of over €1.5 trillion, employing more than 22 million people

Sector	Annual turn-over (billion €)	Employment (million)	Data source
Food	800	4.1	CIAA
Agriculture	210	15	COPA-COGECA
Paper/Pulp	400	0.3 direct (4 ind.)	CEPI
Forestry/Wood industry	150	2.7	CEI-BOIS
Industrial Biotech.	50 (est.)		McKinsey*
Total	1610	22.1	

* estimated to be 10% of sales within the chemical industry accounting for €125 million by 2010



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THE EUROPEAN KNOWLEDGE-BASED BIOECONOMY

QUALITY ASSURANCE STRATEGIES TRACEABILITY, CONSUMER SCIENCE

STABILITY - BIODEGRADABILITY FUNCTIONALITY (Chirality)

SOCIETAL NEEDS

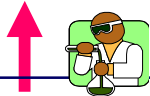


**“Fork to Farm”
Food, health and well-being**

Life sciences & biotechnology for sustainable non-food products + processes

ADVANCED FOOD TECHNOLOGIES, FOOD QUALITY DETERMINANTS, NUTRITION
LOW INPUT FARMING - BIODIVERSITY ANIMAL HEALTH - RURAL DEVT.

PROCESSING



**WHITE BIOTECH
CLEAN BIOPROCESSES
RAW MATERIALS/WASTE**
**GREEN/BLUE BIOTECH
OPTIMISED RAW MATERIALS**

PRODUCTION

Sustainable production and management of biological resources from land, forest, and aquatic environments



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Some major trends/challenges affecting the Bio-economy

1. Changing patterns in world trade:
 - globalisation
 - CAP reform
 - consumer-led production

2. Coping with climate change:
 - spread of plant diseases
 - new varieties/crops
 - coping with unpredictability
 - water issues
 - soil degradation

3. Feeding the increasing world population:
 - 6.5 bn in 2005 \Rightarrow 8.3 bn in 2030
 - increasing calorie consumption per capita
 - rising meat demand – up 70% by 2030

4. Increasing environmental considerations:
 - minimizing further agricultural land use
 - habitat protection
 - maintenance of biodiversity

5. Shifts in energy supply:
 - higher costs of fossil fuels/scarcity
 - security of supply
 - CO₂ reduction



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FP7 2007 – 2013

Specific Programmes

	€ M *
<i>Cooperation – Collaborative research</i>	32.365
<i>Ideas – Frontier Research</i>	7.460
<i>People – Human Potential</i>	4.728
<i>Capacities – Research Capacity</i>	4.217
+	
JRC (non-nuclear)	
JRC (nuclear)	
Euratom	

* Council's agreement of July 2006

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Cooperation – Collaborative research

10 Themes

€ M *

1.	Health	6.050
2.	Food, Agriculture, Fisheries and Biotechnology	1.935
3.	Information and Communication Technologies	9.110
4.	Nanosciences, Nanotechnologies, Materials and new Production Technologies	3.500
5.	Energy	2.300
6.	Environment (including Climate Change)	1.900
7.	Transport (including Aeronautics)	4.180
8.	Socio-Economic Sciences and the Humanities	610
9.	Space	1.430
10.	Security	1.350

* Council's agreement of July 2006

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SEVENTH FRAMEWORK
PROGRAMME



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Theme 2: Food, Agriculture, Fisheries and Biotechnology: Rationale (1)

- Build a European Knowledge-Based Bio-Economy (KBBE)
‘Bio-economy’: All industries and economical sectors that produce, utilize or manage biological resources
- Respond to environmental, social and economic challenges:
 - Food for an increasing world population (9 billion by 2050)
 - Consumers’ demands for high quality food and feed
 - Competitive AND sustainable farming (reduced environmental impact)
 - Adaptation of crops and agricultural management practices to emerging climate changes (biotic and abiotic stress)
 - Safeguard and boost biodiversity and multifunctionality of the rural landscape
 - Biomaterials and energy from renewable bio-resources





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Theme 2: Food, Agriculture, Fisheries and Biotechnology: Rationale (2)

- Involve all stakeholders in research (incl. industry) and link up with other important Community policies
- Respond quickly to emerging research needs through continuous updates of the Work Programme
- Increased focus on international collaboration
- Research activities: to provide important contributions to the areas of **plant breeding**, **improved crops** and **plant protection** as well as **advanced detection and monitoring technologies**

4 Fs: Food, Fibre, Fuel and Feed!



2. Food, Agriculture, Fisheries and Biotechnology

2.1.

Sustainable production and management of biological resources
from land, forest, and aquatic environments

2.2.

“Fork to farm”: Food (including sea-food), health and well being

2.3.

Life sciences, biotechnology and biochemistry for sustainable
non-food products and processes



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Activity 1:

Sustainable production and management of biological resources from land, forest and aquatic environments

Enabling research ('omics', converging technologies, bio-informatics, biodiversity) for micro-organism, plants and animals

Competitive, sustainable and multifunctional agriculture, forestry, fishery and aquaculture

Animal health production and welfare; animal diseases incl. zoonoses

Marine resources, fishery, aquaculture

Development of policy strategies for knowledge based bio-economy, agriculture, fishery as well as rural and coastal areas





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Activity 2:

“Fork to farm”- Food (including sea-food), health and well being

Consumer, societal, industrial and health aspects of food and feed; consumer perception and attitudes towards food, including traditional food, understanding societal and cultural trends

Nutrition, diet related diseases and disorders

Innovative food and feed processing

Improved quality and safety of food, beverage and feed

Total food chain concept





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Activity 3:

Life sciences, biotechnology and biochemistry for sustainable non-food products and processes

**Improved crops, feed-stocks,
marine products and biomass
for energy, environment, and
high added value industrial
products; novel farming
systems**

**Bio-catalysis; new bio-refinery
concepts and other
bioprocesses**

**Forestry and forest based
products and processes**

**Environmental remediation and
cleaner processing**





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Activity 1: Sustainable production and management of biological resources from land, forest and aquatic environments

Indicative Topics

Area 2.1.1 Enabling Research

Call FP7-KBBE-2008-2B

- Development of new tools and processes based upon genomic resources to support R&D in crop plants for breeding - SCP
- Regulation of environmental responses and developmental processes by epigenetics in crop plants - SCP



*Status: WP Draft from October 2007
subject to alterations*



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Activity 1: Sustainable production and management of biological resources from land, forest and aquatic environments

Indicative Topics

Area 2.1.2 Increased sustainability of all production systems (agriculture, forestry, fisheries and aquaculture); plant health and crop protection

Call FP7-KBBE-2008-2B

- Development of appropriate indicators of the relationship between organic/low-input farming and biodiversity - SCP
- New and converging technologies for Precision Livestock Farming in European animal production systems – CSA (coordinating)
- Assessment and mitigation of the impact of aquaculture on wild populations - SCP
- Microbial control for more sustainable aquaculture - SCP
- Improved agro-forestry systems for sustainable farming – SICA - SCP
- Forecasting forest diversity under the influence of climatic changes and the consequences for stability and productivity of forest ecosystems - SCP
- Forest energy – Short rotation forestry as a sustainable and co-efficient land use management system for fossil fuels substitution within CDM-projects – CSA (coordinating)
- Novel approaches for reducing nitrogen losses – CSA (supporting)



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Activity 1: Sustainable production and management of biological resources from land, forest and aquatic environments

Indicative Topics

Area 2.1.3 Optimised animal health, production and welfare across agriculture, fisheries and aquaculture

Call FP7-KBBE-2008-2B

- Improving production animal health and food safety through investigating the gut function of farm animals, the gastro-intestinal microflora and their interactions - SCP
- Foot-and-mouth disease: improve and / or develop vaccine, vaccination strategies and diagnostics assays for free and endemic settings – SICA - SCP
- Improve tools and strategies for the prevention and control of classical swine fever - SCP



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Activity 1: Sustainable production and management of biological resources from land, forest and aquatic environments

Indicative Topics

Area 2.1.4 Socio-economic research and support to policies

Call FP7-KBBE-2008-2B and Call FP7-ERANET-2008-RTD

- Development of new diagnostic methods in support of Plant Health policy - SCP
- Deep sea fisheries management - SCP
- Fisheries management approach based on 'maximum acceptable limits of negative impacts' - SCP
- Common Agricultural Policy – the spatial dimension in EU rural development programmes - SCP
- Macro-economic analysis of competitiveness, including non-tariff barriers - SCP
- Societal Impact of Organic Farming – CSA (supporting)
- Exploring the pros & cons and the public perception of GM animals CSA (supporting)
- Characterisation and valorisation of Andean soil microbial diversity to support sustainable crop production and agro-ecosystems – SICA (Latin America-Andean region) - SCP
- Quality Assurance Schemes – CSA (supporting)
- Agriculture and sustainable development in a rural development context - ERANET
- Coordinating the activities of KBBE relevant European Technology Platforms – CSA (supporting)



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Activity 2:

“Fork to farm”- Food (including sea-food), health and well being

Indicative Topics

Area 2.2.1 Consumers

[Call FP7-KBBE-2008-2B](#)

- Measures aimed at promoting healthy eating habits - SCP



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Activity 2:

“Fork to farm”- Food (including sea-food), health and well being

Indicative Topics

Area 2.2.2 Nutrition

[Call FP7-KBBE-2008-2B](#)

- Optimal human cell function and nutrition - SCP
- Bioactive compounds in traditional food products – SICA (Black Sea Region) - SCP
- Obesity prevention in the Mediterranean area – SICA (Mediterranean Partner Countries) - SCP



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Activity 2:

“Fork to farm”- Food (including sea-food), health and well being

Indicative Topics

Area 2.2.3 Food processing

[Call FP7-KBBE-2008-2B](#)

- Exploring the micro-structure of foods - SCP
- Alternatives to sulphites in foods - SCP
- Training and career development for future food scientists – CSA (supporting)



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Community research

Activity 2:

“Fork to farm”- Food (including sea-food), health and well being

Indicative Topics

Area 2.2.4 Food Quality and Safety

Call FP7-KBBE-2008-2B

- Perfluorinated organic compounds in food - SCP
- Biocides and antibiotic resistance - SCP



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Community research

Activity 2:

“Fork to farm”- Food (including sea-food), health and well being

Indicative Topics

Area 2.2.5 Environmental impacts and total food chain

Call FP7-KBBE-2008-2B

- Influence of food contaminants on early programming leading to obesity - SCP
- A lead market vision for food – CSA (supporting)
- Dissemination of research projects in the food sector – CSA (supporting)



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Activity 3:

Life sciences, biotechnology and biochemistry for sustainable non-food products and processes

Indicative Topics

Area 2.3.1 Improved biomass and plant based renewables

Call FP7-KBBE-2008-2B

- Plant natural products – Alternative sources for the synthesis of bioactive or industrial added value products - SCP
- Sweet sorghum – An alternative energy crop for biofuel production in semi-arid and temperate regions – SICA (Latin America, South Africa, India) - SCP
- European non-food crops and their industrial application – CSA (coordinating)
- Plant-produced vaccines – SICA (Russia) - SCP
- Development of fermentor-like applications and other plant-based containment systems for molecular farming - SCP



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Activity 3:

Life sciences, biotechnology and biochemistry for sustainable non- food products and processes

Indicative Topics

Area 2.3.2 Bioprocesses

Call FP7-KBBE-2008-2B

- Molecular modelling for rational design of industrial enzymes – SICA (Russia) - SCP
- Industrial bioprocesses for fine and speciality chemicals – CSA (coordinating)
- Nanobiotechnology based biosensors for optimised bioprocesses - SCP
- Novel nanobiotechnology (bio to nano) processes and products – CSA (supporting)
- Life cycle analysis and socioeconomic assessment of integrated biorefineries – CSA (coordinating)
- Development of high performance composites based on flax and hemp – CSA (coordinating)
- Industrially relevant products and processes from marine biotechnology - SCP



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Activity 3:

Life sciences, biotechnology and biochemistry for sustainable non-food products and processes

Indicative Topics

Area 2.3.3 Environmental biotechnologies; use of waste and by-products

Call FP7-KBBE-2008-2B

- Upgrading of wood, wood-related residues and humic-origin substances to value-added chemicals and materials: from biological understanding to innovative applications – SICA (Russia) - SCP
- Aquatic anaerobic bioremediation - SCP



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Theme 2-specific requirements and some general aspects of importance

- Specific participation rule for Specific International Co-operation Actions (SICAs):
2 + 2 (or more if specified – may also target countries or regions)
- Funding thresholds (to be regarded as an eligibility criterion !):
small Collaborative Projects: up to 3 M€
Coordination and Support Actions: up to 1 M€
- One project per topic is funded
- Participation of international organisations and participants from third countries possible (and encouraged) in addition to minima



The launch of the “new” SCAR

- **1974:** Council Regulation N° 1728/74 establishing SCAR
- **July 2004:** SCAR management transferred from DG AGRI to DG RTD
- **22 November 2004:** Dutch Presidency report calling for a high-level decision platform: a new role for SCAR
- **End November 2004:** MS to nominate two high-level representatives
- **2-3 February 2005:** First “new” SCAR meeting
 - *New mandate*
 - *Establishment of a standing oversight working group*
 - *Nomination of Observers*
- **9-10 June 2005:** 2nd plenary meeting
- **1-2 December 2005:** 3rd Third plenary meeting
- **15-16 June 2006:** 4th plenary meeting
- **4-5 December 2006:** 5th plenary meeting
- **25-26 June 2006:** 6th plenary meeting
- **3-4 December 2007:** 7th plenary meeting



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SCAR tasks

Main role for SCAR:

Support the Commission and MS towards better coordination of agricultural research across the ERA

This will involve:

Strategic discussions on the agricultural research agenda in Europe in the long term (FP7 and beyond)

Enhanced cooperation between MS (joint research programmes, common infrastructures)

Research agenda in scientific support to the CAP

Exchange of information with complementary mechanisms under EU Framework Programmes



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Main SCAR initiatives

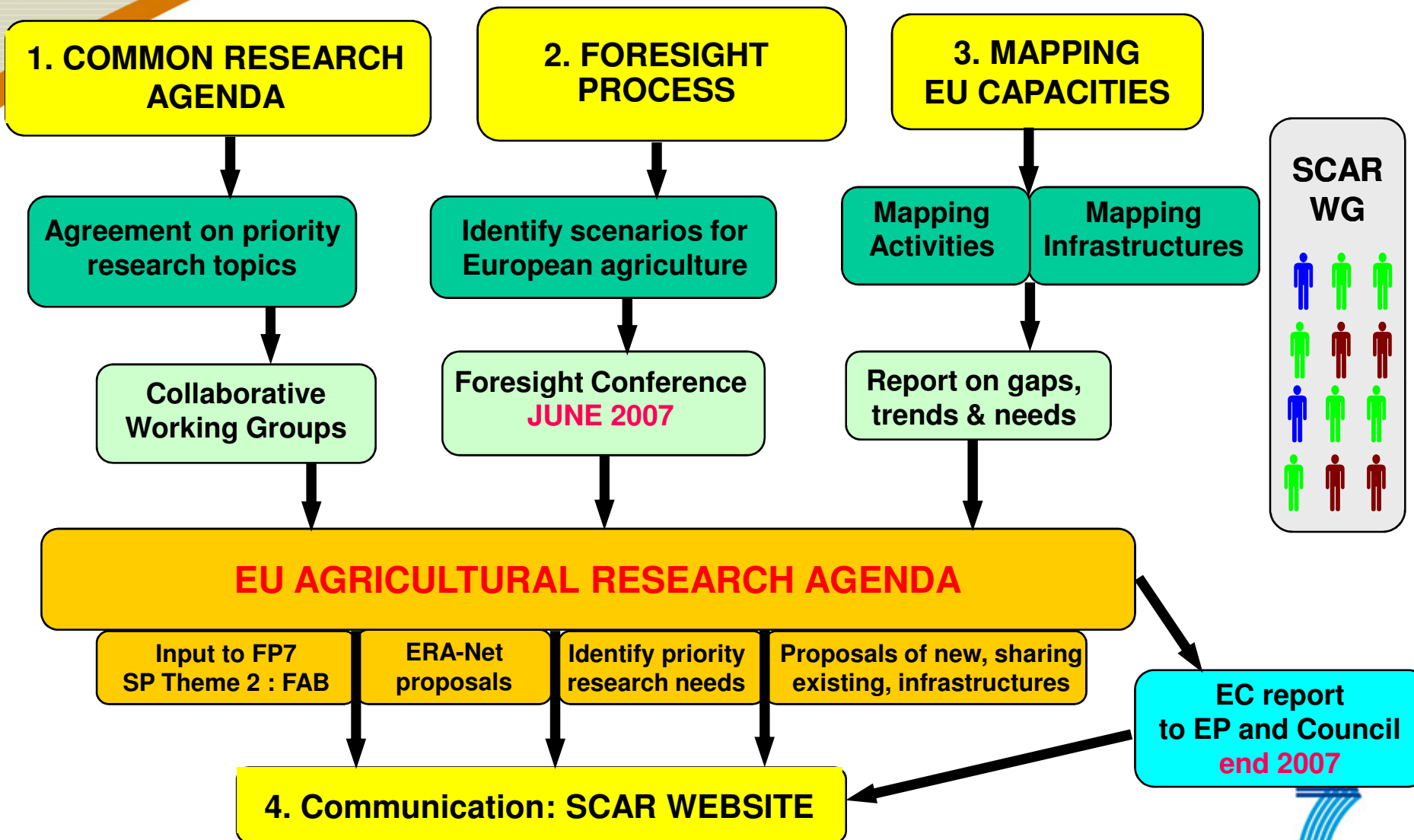
1. Priority topics for a Common Research Agenda
2. Foresight activities – EU outlook agriculture 2020
3. Mapping infrastructures / institutions / activities



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Towards an Agricultural research agenda at European level





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1. Towards a Common Research Agenda

Agreement on priority topics

- Strategic discussions on the agricultural research agenda in Europe based on existing and possible future coordination fora (e.g. ERA-Nets, Technology Platforms, Networks of Excellence)
- Identified areas for possible cooperation between Member States

Establishment of collaborative working groups (CWGs)

- Report on national programmes, capacities and infrastructures (mapping activity)
- Identification of research gaps
- Identify priorities for collaborative research activities between Member States
- Proposals for ERA-NETs

Input to FP7 Specific Programme Theme 2 “*Food, Agriculture, Biotechnology*”

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1. Towards a Common Research Agenda Collaborative Working Groups on 12 themes

Title	Coordinator	Number of countries	Title	Coordinator	Number of countries
ICT and Robotics in Agriculture	Denmark	11	Advanced Technologies for Climatic Control of Greenhouses and livestock housing	Israel	14
Renewable Raw Materials and their Applications in Non-Food Industry	Germany	18	Adaptation of Human Nutrition to Environment Evolution	France	10
Sustainable Livestock Production from Grasslands	Ireland	21	Ecology for Ecosystems & Natural Resources Sustainable Management	France	8
Relevant Issues for Mediterranean Agriculture ERA-NET PRPOSAL !	Italy/France	11	Development of Sustainable Agriculture in the Baltic Sea Region	Poland	8
Agriculture and Sustainable Development	France	11	Common/coordinated research agenda for EU rural policy	Sweden Netherlands	7
Animal Health ERA-NET PRPOSAL !	UK	21	Ecological Networks and Corridors including Defragmentation and Natura 2000	The Netherlands	13



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2. Foresight process Overview

Overall objective

To analyse possible **scenarios** for European agriculture in a 20-year perspective, allowing the identification of **specific research needs** for the medium and long term

Methodology and timetable

Foresight exercise:

1. The appointment of a Foresight Expert Group, *June-December 2006*

Research priority setting exercise:

2. Involvement of stakeholders, *January-June 2007*

3. Conference “*Towards Future Challenges of Agricultural Research in Europe*”, Brussels, *26-27 June 2007*

4. SCAR initiatives on the way forward, *4 December 2007*

5. Commission report to EP and Council, *autumn 2008*



2. Foresight process

The Foresight Expert Group

1. A set of foresight papers on major driving forces:

- Science and technology
- Rural economy
- Health
- Societal changes
- Economy and trade
- Environment
- Climate change
- Bioproducts

2. A synthesis report on 4 disruption scenarios:

- Climate Shock
- Energy Crisis
- Food Crisis
- Cooperation with nature

3. Dissemination to the stakeholders

- *31 December 2006*: foresight papers + synthesis report
- *January 2006*: dissemination of the foresight documents
- *29-30 March 2007*: stakeholders workshop in Stockholm
- **26-27 June 2007**: Conference “Towards Future Challenges of Agricultural Research in Europe”



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2. Foresight process

Conference “Towards Future Challenges of Agricultural Research in Europe”, Brussels, 26-27 June 2007

KEY MESSAGES FROM THE CONFERENCE

- The need for a renewed AR system in Europe
- Priority to education and dissemination
- Thematic issues on top of the future AR agenda (e.g. climate change, agriculture and energy)
- Developing a multidisciplinary approach
- Continued assessment of foresight developments

PROPOSED ACTIONS

- A foresight monitoring mechanism
- New temporary Collaborative Working Groups (CWGs)
 - *Climate change and agriculture under the perspectives of adaptation and mitigation*
 - *Agriculture and energy and the specific research needs resulting from their mutual interaction*
- Workshop on the reform of agricultural knowledge systems in several European countries and its impact on the European agricultural research system

MILESTONE: a Commission report to the EP and the Council (autumn 2008)



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2. Foresight process Webpage of the conference

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

The poster features a blue header with the European Union flag and the word "RESEARCH" in yellow. Below this, the text "CONFERENCE CHARLEMAGNE- BRUSSELS 26-27 JUNE 2007" is displayed in white. The main title, "Towards future challenges of agricultural research in Europe", is written in large yellow letters over a green landscape background. On the left side, there is a logo for "Food, Agriculture and Fisheries, and Biotechnology Knowledge Based Bio-Economy" and a green box with "SCAR" in white. Below that is the "SEVENTH FRAMEWORK PROGRAMME" logo, which consists of a blue arrow pointing right.

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3. Mapping of EU agriculture research capacity

Infrastructures

- Identification of key-agriculture infrastructures of EU relevance
- Sharing existing infrastructures among MS research teams
- Proposals for critical large scale infrastructures:
 - Genetic and biological resource centres
 - Agriculture, forestry and environment observatories
 - Human nutrition research centres
 - Advanced experimental facilities for infectious diseases
- Links with ESFRI

Activities & Institutions

- Building on *EU AGRI MAPPING* project (SSP4): “Mapping and foresight of the European agricultural & food research capacity”
 - Coverage: 33 SCAR countries
 - Database on research establishments
 - Mapping report identifying the main players
 - Consolidated report on the trends and the needs
 - Recommendations towards the development of the research potential



SCAR plenary meeting – draft agenda 3-4 December 2007

1. **Opening of meeting**
2. **Adoption of the draft agenda**
3. **Adoption of the draft minutes from the meeting 25-26 June 2007**
4. **Agricultural research structures and perspectives in SCAR countries** (Contribution from BE, DK, NL and SI delegations)
5. **Foresight activities – EU outlook agriculture 2020**
 - Draft SCAR position paper on the follow-up of the Conference*
 - Proposals for implementing initiatives*
6. **Agricultural Research for Development**
 - Outcome of ERA-ARD Conference - 28-29 June 2007, Brussels*
 - Follow-up initiatives*
7. **Possible initiatives on Infrastructures** (Proposal from FR delegation)
8. **Update on on-going activities**
 - Update on the "health check" of the CAP Reform*
 - Update on collaborative working groups (CWGs) and new ERA-Nets*
 - Towards a Commission report on the coordination of agricultural research in Europe*
 - The EU AGRI MAPPING project, outlook from the coordinator*
9. **Green Paper "The European Research Area: New Perspectives"** (Information and comments)
10. **AOB**



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SCAR website

linking with relevant MS/institution

http://europa.eu.int/comm/research/fp6/scar/index_en.cfm

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Further Information

FP7 on CORDIS:

<http://cordis.europa.eu/en/home.html>

**Research and Innovation
on the Europa server:**

http://europa.eu/pol/rd/index_en.htm

DG Research:

http://ec.europa.eu/research/index_en.cfm

Biosociety Website:

http://ec.europa.eu/research/biosociety/index_en.htm