

Analysing agriculture and rural areas in Europe

A synthesis of research programmes in 20 countries



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Analysing agriculture and rural areas in Europe

A synthesis of research programmes in 20 countries

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LEI report 2011-052

October 2011

Project code 2272000192

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Analysing agriculture and rural areas in Europe; A synthesis of research programmes in 20 countries

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LEI report 2011-052

ISBN/EAN: 978-90-8615-532-3

Price € 19,25 (including 6% VAT)

83 p., tab., app.

Project BO-11-016-006, 'Participation in RURAGRI ERA-Net'

This research project has been financed by the European Commission and carried out within the Policy Supporting Research for the Ministry of Economic Affairs, Agriculture and Innovation, Theme: Rural policy/climate.



Photo cover: Shutterstock

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Preface

So far, few initiatives have been taken at a European or transnational level for co-operative research activities in the field of agriculture and rural development. Some research programmes address the agricultural and rural development challenges at a European scale. What was missing is a European platform for funders of research dealing with the new relationships between rural areas and agriculture in Europe and the challenge of sustainability. This gap is filled through the ERA-NET 'RURAGRI - Facing sustainability: new relationships between rural areas and agriculture in Europe'. RURAGRI aims to improve coordination between on-going and future European, national and regional research programmes. It includes a consortium of 23 partners from 20 countries.

RURAGRI targets at research programmes dealing with the new relationships between rural areas, agriculture in Europe and the challenge of sustainability. A survey was organised in 2010 to evaluate and analyse existing research programmes in the countries, participating in the consortium. It is aimed at better mutual understanding of how national programmes dealing with rural areas in a context of increasing urbanisation and changing rural-urban relationships, new challenges and opportunities for European agriculture, and/or policies and governance facing sustainability are structured, financed and managed. The key findings of the mapping of research programmes are presented in the report. The synthesis represents the research programmes in 2010 that are covered by the RURAGRI partners. The report is input in the RURAGRI Strategic Research Agenda.

The interaction with all partners in preparing this report is highly appreciated. The publication has been funded under the RURAGRI project, EU 7th Framework Programme, Theme 2 - Food, Agriculture and Fisheries, and Biotechnology, FP7-ERANET-2008-RTD. Additional funds for preparing the report were obtained from the Ministry of Economic Affairs, Agriculture and Innovation in the Netherlands (BO-11-016.006). Its content does not represent the official position of the European Commission and is entirely under the responsibility of the authors.



Prof. Dr R.B.M. Huirne
Managing Director LEI

Summary

S.1 Key findings

The existing research programmes in Europe dealing with the new relationships between rural areas, agriculture and sustainable development, cover a wide range of topics in the domains of ecology and economy (Table S.1). (See section 3.1)

Table S.1		Topics of the mapped programmes
Topic (number of countries that indicate the topic)	Response by countries	
<i>Ecological dimension</i>		
Landscape, biodiversity, nature (15)	Belgium, Cyprus, Denmark, France, Germany, Ireland, Israel, Italy, Poland, the Netherlands, Scotland, Slovenia, Spain, Switzerland, Turkey	
Management of natural resources, ecosystem services (17)	Austria, Belgium, Cyprus, Denmark, France, Germany, Hungary, Ireland, Israel, Italy, Lithuania, Poland, the Netherlands, Scotland, Spain, Switzerland, Turkey	
Climate change (mitigation, adaptation) (16)	Austria, Cyprus, Denmark, France, Germany, Hungary, Ireland, Israel, Italy, Lithuania, Poland, the Netherlands, Spain, Sweden, Switzerland, Turkey	
<i>Economic dimension</i>		
Farming practices (15)	Belgium, Cyprus, Denmark, Germany, Ireland, Israel, Italy, Lithuania, Poland, the Netherlands, Scotland, Spain, Sweden, Switzerland, Turkey	
Food security, safety, consumer behaviour (13)	Cyprus, France, Germany, Hungary, Ireland, Israel, Italy, Lithuania, Poland, Scotland, Spain, Sweden, Turkey	
Land management (19)	Austria, Belgium, Cyprus, Denmark, France, Germany, Hungary, Ireland, Israel, Italy, Latvia, Lithuania, Poland, the Netherlands, Scotland, Slovenia, Sweden, Switzerland, Turkey	

Table S.1 The topics of the mapped programmes (continued)	
Topic (number of countries that indicate the topic)	Response by countries
<i>Societal dimension</i>	
Rural and urban areas (13)	Austria, Belgium, Cyprus, Denmark, France, Italy, Lithuania, Poland, the Netherlands, Spain, Sweden, Switzerland, Turkey
Cultural and demographic trends (7)	Belgium, Germany, Italy, Poland, Slovenia, Sweden, Turkey
<i>Institutional dimension</i>	
Institutions and governance (8)	Belgium, Denmark, France, Germany, Italy, Lithuania, Poland, Switzerland

Quality of soil, water and air are important issues in the ecological domain of sustainable development. Ecosystem services and climate change are important topics as well. In the social domain the existing programmes put emphasis on the development of rural and urban areas and the institutional domain is focused on policy instruments, institutions and governance. The economic domain of sustainable development covers a broad range, including: (i) land use, (ii) land management, (iii) farming practices, and (iv) food security, safety and consumer behaviour. Finally, the ecological coverage of the research programmes include: (i) climate change (mitigation and adaptation), (ii) landscape, biodiversity and nature, (iii) management of natural resources, ecosystem services, and (iv) soil, water and air (quality/quantity).

S.2 Complementary findings

In addition to the mapping of existing research programmes and their focus, we also identified possible topics for future co-operation. This bottom-up approach, mapping research programmes in 20 countries, will also be input into the Strategic Research Agenda of RURAGRI. Main research needs and priorities of the member states participating in RURAGRI include: (i) ecosystems, public goods and the management of natural resources, (ii) land management and (iii) urban-rural relations. ([See Chapter 4](#)).

S.3 Methodology

The current report is a synthesis of national reports describing the knowledge infrastructure and research programmes in the field of agriculture and/or rural development in a context of sustainable development. National reports are prepared for each country participating in RURAGRI to summarise the knowledge infrastructure in the participating countries. ([See Chapter 1](#))

The survey includes three parts:

- Part 1 - General information. Identification of the main research topics and the funding mechanisms;
- Part 2 - Description of relevant research programmes;
- Part 3 - Future cooperation and topics for future co-operation are identified.

The survey has been organised to evaluate and analyse existing research, increase exchange of information about existing research programmes, funds and capacities in all countries participating in the consortium. It is aimed at better mutual understanding on how national programmes dealing with European rural areas in a context of increasing urbanisation and changing rural-urban relationships, new challenges and opportunities for European agriculture, and/or policies and governance facing sustainability are structured, financed and managed.

Samenvatting

S.1 Belangrijkste uitkomsten

De bestaande onderzoeksprogramma's in Europa houden zich bezig met de nieuwe relaties tussen plattelandsgebieden, landbouw en duurzame ontwikkeling en bestrijken een brede reeks onderwerpen op het vlak van ecologie en economie (Tabel S.1).

Tabel S.1 Onderwerpen van de in kaart gebrachte programma's	
Onderwerp (het aantal landen dat het onderwerp vermeldt)	Respons door landen
<i>Ecologische dimensie</i>	
Landschap, biodiversiteit, natuur (15)	België, Cyprus, Denemarken, Duitsland, Frankrijk, Ierland, Israël, Italië, Polen, Nederland, Schotland, Slovenië, Spanje, Turkije, Zwitserland
Beheer van natuurlijke bronnen, ecosysteemdiensten (17)	België, Cyprus, Denemarken, Duitsland, Frankrijk, Hongarije, Ierland, Israël, Italië, Litouwen, Nederland, Oostenrijk, Polen, Schotland, Spanje, Turkije, Zwitserland
Klimaatverandering (bestrijding, adaptatie) (16)	Cyprus, Denemarken, Duitsland, Frankrijk, Hongarije, Ierland, Israël, Italië, Litouwen, Nederland, Oostenrijk, Polen, Spanje, Turkije, Zweden, Zwitserland
<i>Economische dimensie</i>	
Landbouwpraktijken (15)	België, Cyprus, Denemarken, Duitsland, Ierland, Israël, Italië, Litouwen, Nederland, Polen, Schotland, Spanje, Turkije, Zweden, Zwitserland
Voedselveiligheid, veiligheid, consumentengedrag (13)	Cyprus, Duitsland, Frankrijk, Hongarije, Ierland, Israël, Italië, Litouwen, Polen, Schotland, Spanje, Turkije, Zweden
Landbeheer (19)	België, Cyprus, Denemarken, Duitsland, Frankrijk, Hongarije, Ierland, Israël, Italië, Letland, Litouwen, Nederland, Oostenrijk, Polen, Schotland, Slovenië, Turkije, Zweden, Zwitserland

Tabel S.1 De onderwerpen van de in kaart gebrachte programma's (vervolg)	
Onderwerp (het aantal landen dat het onderwerp vermeldt)	Respons door landen
<i>Maatschappelijke dimensie</i>	
Landelijke en stedelijke gebieden (13)	België, Cyprus, Denemarken, Frankrijk, Italië, Litouwen, Nederland, Oostenrijk, Polen, Spanje, Turkije, Zweden, Zwitserland
Culturele en demografische trends (7)	België, Duitsland, Italië, Polen, Slovenië, Turkije, Zweden
<i>Institutionele dimensie</i>	
Instanties en bestuur (8)	België, Denemarken, Duitsland, Frankrijk, Italië, Litouwen, Polen, Zwitserland

De kwaliteit van bodem, water en lucht speelt een belangrijke rol in het ecologische domein van duurzame ontwikkeling. Ecosysteemdiensten en klimaatverandering zijn tevens belangrijke onderwerpen. In het maatschappelijke domein leggen de bestaande programma's de nadruk op de ontwikkeling van stad en platteland en in het institutionele domein richt men zich op beleidsinstrumenten, instanties en bestuur. Het economische domein van duurzame ontwikkeling bestrijkt een brede reeks onderwerpen, zoals: (i) landgebruik, (ii) landbeheer, (iii) landbouwpraktijken en (iv) voedselveiligheid, veiligheid en consumentengedrag. Ten slotte omvat het ecologische domein van de onderzoeksprogramma's: (i) klimaatverandering (bestrijding en adaptatie), (ii) landschap, biodiversiteit en natuur, (iii) beheer van natuurlijke bronnen, ecosysteemdiensten en (iv) bodem, water en lucht (kwaliteit/kwantiteit).

S.2 Overige uitkomsten

Naast het in kaart brengen van bestaande onderzoeksprogramma's en hun focus hebben we tevens mogelijke onderwerpen voor toekomstige samenwerking vastgesteld. Deze bottom-up aanpak, waarmee onderzoeksprogramma's in 20 landen in kaart worden gebracht, wordt ook toegepast op de Strategische Onderzoeksagenda van RURAGRI. Tot de belangrijkste onderzoeksbehoeften en -prioriteiten van de lidstaten die aan het ERA-netwerk RURAGRI deelnemen, be-

horen: (i) ecosystemen, collectieve goederen en het beheer van natuurlijke bronnen, (ii) landbeheer en (iii) de relatie tussen stad en platteland.

S.3 Methode

Het huidige rapport is een synthese van nationale rapporten waarin de kennisinfrastructuur en onderzoeksprogramma's op het vlak van landbouw en/of plattelandontwikkeling worden beschreven in een context van duurzame ontwikkeling. In ieder land dat deelneemt in RURAGRI worden nationale rapporten voorbereid om de kennisinfrastructuur in de deelnemende landen samen te vatten.

Het onderzoek bestaat uit drie delen:

- Deel 1 - Algemene informatie. Vaststelling van de belangrijkste onderzoeksobjecten en de financieringsmechanismen;
- Deel 2 - Beschrijving van relevante onderzoeksprogramma's;
- Deel 3 - Vaststelling van toekomstige samenwerking en objecten voor toekomstige samenwerking.

Het onderzoek is georganiseerd om bestaande onderzoeksprogramma's te evalueren en te analyseren en meer informatie uit te wisselen over bestaande onderzoeksprogramma's, de financiering en capaciteiten in alle landen die deel uitmaken van het consortium. Het onderzoek is gericht op een beter wederzijds begrip van de structuur, financiering en het beheer van nationale programma's die zich bezighouden met Europese plattelandsgebieden in een context van groeiende verstedelijking en een veranderende relatie tussen stad en land, nieuwe uitdagingen en kansen voor de Europese landbouw en/of beleid en bestuur ten aanzien van duurzaamheid.

1 Introduction

A systematic overview of relevant research programmes in each country of the RURAGRI-Network (RURAGRI Partners listed in Table 1.1) establishes a basis for a future cooperation. It will enable the network to identify commonalities and differences as well as potentials and barriers. Further on, first ideas about forthcoming research calls have been collected. Much of the information on existing national and international research programmes has been compiled before (e.g. EU Agri Mapping project¹, the 'Survey on Research Infrastructures in Agri-Food Research' reported to the Standing Committee on Agricultural Research in February 2010²). Considering the broadness of these fields and the already existing information, the primary objectives of the mapping exercise in RURAGRI were therefore not only to provide a comprehensive picture of the research activities in these fields but also and foremost to understand:

- the principle funding mechanisms in the partner countries;
- the core expertise and the strengths of the partners involved in RURAGRI;
- the main interests in future joint activities and thematic topics of RURAGRI partners.

We believe that focusing the mapping exercise on these main issues and drawing conclusions from the national mapping reports in this synthesis report will help to further shape the course of the ERA-NET RURAGRI.

¹ <http://www.europartnersearch.net/eu-agri-mapping/index.php>

² http://ec.europa.eu/research/agriculture/scar/pdf/final_scar_survey_report_on_infrastructures_february_2010.pdf

Table 1.1 **RURAGRI partners**

1. *Austria* - Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW) (website: <http://www.dafne.at>).
2. *Belgium* - Flemish Ministry of Agriculture. Project partner: Institute of Agricultural and Fisheries Research (ILVO) (website: <http://www.ilvo.vlaanderen.be/>).
3. *Cyprus* - Research Promotion Foundation (RPF) (website: <http://www.research.gov.cy>). Project partner: Agricultural Research Institute (website: <http://www.ari.gov.cy>).
4. *Denmark* - funding is channelled through the Danish Research Councils (website: <http://www.fi.dk>). The Green Development and Demonstration Programme (GUDP) is a scheme under The Ministry of Food, Agriculture and Fisheries (website: <http://ferv.fvm.dk/GUDP>).
5. *France* - Ministry of Agriculture, Food, Fisheries, Rural Affairs and Town and Country Planning (Regional Development) (MAAPRAT) (website: <http://agriculture.gouv.fr/recherche-developpement>), Ministry of Higher Education and Research (MESR) (website: <http://www.enseignementsup-recherche.gouv.fr/>). National Research Agency (ANR) (website: <http://www.agence-nationale-recherche.fr/en>). Project partner: Institut National de la Recherche Agronomique (INRA) (website: <http://www.inra.fr/>).
6. *Germany* - Federal Ministry of Education and Research (BMBF) (website: <http://www.bmbf.de/en/>) as programme owner and Forschungszentrum Jülich GmbH/Project Management Jülich (FZJ) as programme manager (website: <http://www.ptj.de/>).
7. *Hungary* - Project partner: Hungarian Academy of Sciences, Institute of Economics (website: <http://mta.hu/english/>).
8. *Ireland* - Teagasc (Agriculture and Food Development Authority) (website: <http://www.teagasc.ie/>). Teagasc is funded through the Department of Agriculture, Fisheries and Food, DAFF (website: <http://www.agriculture.gov.ie/research/>).
9. *Israel* - Ministry of Agriculture and Rural Development (Agricultural Research Organization, ARO) (website: <http://www.moag.gov.il/agri/English>).
10. *Italy* - Ministry of Agricultural, Food and Forestry Policies (MIPAAF) (website: <http://www.politicheagricole.it/>).
11. *Latvia* - Ministry of Education and Science of Republic of Latvia (website: <http://izm.izm.gov.lv/science.html>). Project partner: Latvian Academy of Sciences (website: <http://www.lza.lv>).
12. *Lithuania* - Ministry of Agriculture (website: <http://www.zum.lt/en/>).
13. *Poland* - Ministry of Agriculture and Rural Development (website: <http://minrol.gov.pl>). Project partner: Research Institute of Horticulture, Skierniewice, Poland (website: <http://www.insad.pl>).

Table 1.1 **RURAGRI partners (continued)**

14. *Scotland* - Scottish Government's Rural & Environment Research & Analysis Directorate (RERAD) (website: <http://www.scotland.gov.uk/Topics/Research/About/EBAR>)
15. *Slovenia* - Ministry of Higher Education, Science and Technology (website: <http://www.mvzt.gov.si/en/>)
16. *Spain* - Ministry of the Environment and Rural and Marine Affairs (website: http://www.marm.es/index_en.htm) and Ministry of Science and Innovation (website: <http://www.micinn.es>). Project partner: National Institute for Agricultural and Food Research and Technology (INIA) (website: <http://www.inia.es/inia/>).
17. *Sweden* - Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (FORMAS) (website: <http://www.formas.se/>)
18. *Switzerland* - Federal Office for Agriculture (FOAG) (website: <http://www.blw.admin.ch/>).
19. *The Netherlands* - Ministerie van Economische Zaken, Landbouw en Innovatie (website: <http://www.rijksoverheid.nl/themas/landbouw-natuur-en-voedsel>).
20. *Turkey* - Ministry of Agriculture and Rural Affairs, General Directorate of Agricultural Research (website: <http://www.tagem.gov.tr/eng/anasayfa.htm>).

For the start of the mapping exercise some main questions were formulated:

- What are the programmes? Indicate the planning, implementation, structure and practices. Which R&D actors are involved? Is there bilateral or multilateral co-operation? What is the role of stakeholders?
- What are the research capacities, considering facilities, databases, technology platforms, national fellowships or grant schemes?

The national reports provide detailed responses to these questions and a selection of issues is covered in the synthesis report. The synthesis report is meant to guide next steps in RURAGRI. Several issues addressed in the report only provide a couple of responses, which are meant to identify major thematic priorities for future cooperation.

The synthesis report reflects the inventory undertaken in 2010. We are aware several countries are adjusting their research programmes to emerging topics. We were interested in programmes that currently are operational, as well as programmes that were completed after 2007 or that will start before 2012.

2 Science-policy interaction

A good interaction between science and policy is critical for sound decision making processes and essential to guide the research. Before we summarise the results of the research mapping, we list the policy context of the research, which is represented by the RURAGRI partners. Then we give an overview of the knowledge agenda, the priorities and the main focus of the research programmes across the partner countries. As part of the survey, the partners summarised the key elements of science-policy interaction.

- In *Austria*, BMLFUW is responsible for applied research - supporting the federal government - in the field of agriculture, forestry, environment and water management. Research is aimed at contributing to the policy targets in the field of agriculture, forestry, environment and water management.
- In *Belgium*, the Flemish Ministry of Agriculture funds research through universities and institutes, such as ILVO. ILVO is a research institute that receives its main funding from the Flemish Ministry of Agriculture. Yet, other institutes, e.g. universities can also apply for funds of the Flemish Ministry of Agriculture.
- In *Cyprus*, the research policy is guided by the Ministry of Agriculture, Natural Resources and Environment, and by the Agricultural Research Institute. Research is performed by the Agricultural Research Institute and by the Cyprus University of Technology. The role of the Research Promotion Foundation is to fund research calls in general. Some calls are dedicated to agriculture. However it does not implement policy nor does it implement research.
- In *Denmark*, research in agriculture and rural development is almost exclusively undertaken by public universities, the main funding bodies are the Ministry of Food, Agriculture and Fisheries (GUDP) and the Ministry of Science, Technology and Innovation.
- The advancement of scientific knowledge and the response to societal concerns motivates the science policy in *France*. Programme owners are the National Research Agency (ANR), INRA and the Ministry of Agriculture (MAAPRAT).
- Research related to agriculture, rural and sustainable development is varied in *Germany* both on the level of programme owners as well as on the level of public and private institutions performing the research. The Federal Ministry

of Education and Research (BMBF) mainly funds applied, inter- and trans-disciplinary research in the areas of rural and sustainable development.

- In *Hungary*, the national research programmes targeted at agriculture and rural development distinguish between two groups. First, specialised research programmes supported and controlled by the Ministry of Agriculture and Rural Development (MARD) through its affiliated research institutes. These programmes are not open to researchers, companies, enterprises of other organisations, they are exclusively managed by the MARD research institutes, using own personnel and own budget.¹ Second, there are two national research funding agencies: National Innovation Office (NIO) and Hungarian Scientific Research Fund (HSRF).
- In *Ireland*, Teagasc is the national body providing integrated research, advisory and training services to the agriculture and food industry and rural communities. The organisation is funded through the Department of Agriculture, Fisheries and Food.
- In *Israel*, the Ministry of Agriculture and Rural Development (MOAG) is concerned with solving current problems in agricultural production, introducing new products, processes and equipment, and conducting research investigations in order to achieve among the world's highest levels of agricultural output. The Agricultural Research Organisation (ARO) is the MOAG's research arm, and is tasked with planning, organising and implementing the majority of Israel's agricultural research. Most of the research on agriculture and rural development operates on a project basis. Since 2006, MOAG has been developing a rural development plan. The rural development plan's major goals are to empower the rural regions, villages and communities through regional and local planning, public participation, courses, agro-tourism and positioning the rural regions in the urban Israeli society.
- In *Italy*, the Ministry of Agricultural, Food and Forestry Policies (MIPAAF) is the main funding body for agricultural, agri-food, forestry and rural development issues. It is responsible for the definition of national research programmes in all these areas.
- In *Latvia*, research is funded through the Ministry of Education and Science, and aimed to promote the development of a knowledge-based society in Latvia. More specifically, the policy targets aim to: (i) renew and strengthen

¹ The annual budget of these MARD affiliated Institutes is an organic part of the MARD budget. It is consequently impossible to identify costs and budgets of individual research programmes hosted in these organisations.

the research capacity (human resources and infrastructure), (ii) ensure substantial growth of public investment in research, (iii) enhance the international competitiveness of Latvian research, and (iv) facilitate the transfer of knowledge and technology.

- In *Lithuania*, the Ministry of Agriculture funds applied research on a competitive basis, and also implements the national research programmes and the multidisciplinary research projects through the scientific community. Research aims to offer advice to government and recommendations to farmers and rural stakeholders. Research output focuses on technological innovations and scientific recommendations for consumers, farmers, SMEs, rural services and communities. Some research results are also used as recommendations for policy makers.
- In *Poland*, basic and applied research supervised and promoted by the Ministry of Agriculture and Rural Development, especially the research targeted to strengthening competitiveness of SMEs involved in agricultural sector and rural areas.
- In *Scotland*, the Scottish Government's Rural & Environment Research & Analysis Directorate (RERAD) commissions programmes of strategic research which aim to create a platform of knowledge that strengthens the way in which policies developed in the rural and environment areas contribute to the delivery of national outcomes.
- In *Slovenia*, the Slovenian Research Agency is in charge of promoting research and development, focusing on problem-oriented research and targeted towards improving the competitive capacity of the country.
- In *Spain*, the Ministry of the Environment and Rural and Marine Affairs (MARM) and the Ministry of Science and Innovation (MCI) support the knowledge infrastructure related to RURAGRI, through universities and institute (INIA).
- In *Sweden*, the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning promotes and supports research to help society at large towards ecologically sustainable growth and development.
- In *Switzerland*, the Federal Office for Agriculture is entitled to ensure that through sustainable, market-oriented production, agriculture will secure provision of food for the population, maintenance of the natural basic elements of life, conservation of the cultivated landscape and decentralised settlement of the land. As part of its agricultural policy, the Confederation pursues scientific research, training and information services and manages the agricultural research stations Agroscope.

- In *the Netherlands*, research supports short- and medium-term policy-making, aimed to improve the competitiveness of the European agricultural sector, improving sustainability and dovetailing production with public values.
- In *Turkey*, applied agricultural research is mainly managed by the General Directorate of Agricultural Research (GDAR) of the Ministry of Agriculture and Rural Affairs (MARA). Agricultural, veterinary, food technology and fisheries faculties are mainly engaged in basic research.

In conclusion, the majority of the research funded by the partners includes a mixture of policy support and knowledge development (Austria, Belgium, Cyprus, Denmark, France, Ireland, Latvia, Lithuania, Poland, Scotland, Slovenia, Spain, Switzerland, the Netherlands, and Turkey). Policy relevance is an important criterion, but most of the countries recognise that research of a strategic nature is necessary to develop the knowledge base which underpins policy formulation in the future. The focus is mainly placed on long-term knowledge development with the Swedish and German partners in RURAGRI (i.e. FORMAS, BMBF). In Israel and Italy, there is a focus on research supporting agricultural and rural development policies.

3 Mapping the existing research programmes

3.1 Topics in the research programmes

As part of the mapping of the research programmes, we grouped the issues of concern along the four dimensions of sustainable development, including ecology, economy, social and institutional (Table 3.1).

Table 3.1 The identification of topics and the detailed issues covered by the RURAGRI partners	
Topic	Issues covered
<i>Ecological dimension</i>	
Soil, water and air	Quality of soil, water and air, water quantity
Landscape, biodiversity and nature	Biodiversity, landscape, landscape ecology, genetic heritage of species, nature protection
Management of natural resources, ecosystem services	Management of natural resources, ecosystem services
Climate change (mitigation and adaptation)	Flood (prevention, protection), climate change, carbon sequestration, emission reduction
<i>Economic dimension</i>	
Land use	Land consumption, land use (agriculture, forestry, tourism, et cetera), bioenergy/biofuel, and biomass
Farming practices	Regional entrepreneurship, income, farming practices, animal welfare, product quality, diversification, peri-urban agriculture
Land management	Management
Food security, safety, consumer behaviour	Food security, food safety, animal genetics/physiology/health, production, nutrition and consumer behaviour, breeding, aquaculture and fishery, forestry, plant pests/diseases/physiology

Table 3.1 The identification of topics and the detailed issues covered by the RURAGRI partners (continued)	
Topic	Issues covered
<i>Societal dimension</i>	
Rural and urban areas	Rural area, urbanisation, spatial conflicts, rural-urban relationships, infrastructure, mobility
Cultural and demographic trends	Cultural heritage, demographic changes, health care and education system
<i>Institutional dimension</i>	
Institutions and governance	Administration, institutions and governance (actors, instruments and organisations)

'Soil, water and air' have a sectoral approach. Research into these topics is knowledge orientated, and typical research questions may focus on: What is the water quality like? Is the water quality changing and why? What is the nitrogen balance in a standard farm compared with a farm using precision farming? What is the erosion risk? How does the odour drift from a pig farm?

'Management of natural resources' still has a sectoral coverage (e.g. soil, water, biomass) but a larger focus is also on decision support to optimise the use of these resources. This then also includes the approach of different actors, and it may well include transdisciplinary aspects. Transdisciplinary research involves a team of scientists from different disciplines working together with user-groups. As part of this type of research, the development of common understanding and joint learning is important; it does not only exceed disciplines, but even expands to include non-academic parties in the research process. Some typical research questions: If I optimise my harvest by using the optimum amount of water for my crop, what does this mean for e.g. groundwater surplus, wetland areas? How can I optimise the use of this resource between different demands? Which ecosystem goods and services are delivered to society?

'Land use' addresses the main land use activities (e.g. agriculture, forestry or tourism) and again is mainly knowledge orientated. Typical questions are: What is happening on this specific piece of land? How do different systems of agriculture contribute to greenhouse gas emissions? How can I maintain a good soil fertility? The nature of research on this topic can already be interdisciplinary and often it will also be transdisciplinary.

'Land management' goes beyond these disciplinary approaches, and includes a complex field which acknowledges different requirements for land as well as for different resources. Land management takes the diversity of actors

and their different approaches towards 'land' into account. The drivers and challenges we are facing (climate change, food security, biodiversity loss, demographic change, urban sprawl just to name a few) change the demands of different actors for the limited resource land. Research in this field focuses on decision support to optimise the use of such limited resources, and it has both an interdisciplinary and transdisciplinary approach.

We observe the existing programmes are focused on the social and institutional domains of sustainable development, whereas they cover a wide range of topics in the domains of ecology and economy (Table 3.2). In the social domain the existing programmes emphasise the development of rural and urban areas and the institutional domain focuses on policy instruments, institutions and governance. The economic domain covers a broad range, including: (i) land use, (ii) land management, (iii) farming practices, and (iv) food security, safety and consumer behaviour. Finally, the ecological coverage of the research programmes include: (i) climate change (mitigation and adaptation), (ii) landscape, biodiversity and nature, (iii) management of natural resources, ecosystem services, and (iv) soil, water and air (quality/quantity).

Table 3.2 The topics of the mapped programmes	
Topic (number of countries that indicate the topic)	Response by countries
<i>Ecological dimension</i>	
Landscape, biodiversity, nature (15)	Belgium, Cyprus, Denmark, France, Germany, Ireland, Israel, Italy, Poland, the Netherlands, Scotland, Slovenia, Spain, Switzerland, Turkey
Management of natural resources, ecosystem services (17)	Austria, Belgium, Cyprus, Denmark, France, Germany, Hungary, Ireland, Israel, Italy, Lithuania, Poland, the Netherlands, Scotland, Spain, Switzerland, Turkey
Climate change (mitigation, adaptation) (16)	Austria, Cyprus, Denmark, France, Germany, Hungary, Ireland, Israel, Italy, Lithuania, Poland, the Netherlands, Spain, Sweden, Switzerland, Turkey
<i>Economic dimension</i>	
Farming practices (15)	Belgium, Cyprus, Denmark, Germany, Ireland, Israel, Italy, Lithuania, Poland, the Netherlands, Scotland, Spain, Sweden, Switzerland, Turkey
Food security, safety, consumer behaviour (13)	Cyprus, France, Germany, Hungary, Ireland, Israel, Italy, Lithuania, Poland, Scotland, Spain, Sweden, Turkey

Table 3.2 The topics of the mapped programmes (continued)	
Topic (number of countries that indicate the topic)	Response by countries
Land management (19)	Austria, Belgium, Cyprus, Denmark, France, Germany, Hungary, Ireland, Israel, Italy, Latvia, Lithuania, Poland, the Netherlands, Scotland, Slovenia, Sweden, Switzerland, Turkey
<i>Societal dimension</i>	
Rural and urban areas (13)	Austria, Belgium, Cyprus, Denmark, France, Italy, Lithuania, Poland, the Netherlands, Spain, Sweden, Switzerland, Turkey
Cultural and demographic trends (7)	Belgium, Germany, Italy, Poland, Slovenia, Sweden, Turkey
<i>Institutional dimension</i>	
Institutions and governance (8)	Belgium, Denmark, France, Germany, Italy, Lithuania, Poland, Switzerland

3.2 Role of stakeholders

For a long time, the research funding bodies and research organisations were the main stakeholders involved in the research programmes. Increasingly, there is awareness of the complexity of issues at the edge of agriculture, rural areas and sustainable development. The involvement of research funding bodies and research organisations is insufficient to cope with such public concerns, e.g. agriculture in compliance with the objectives of the Water Framework Directive requires the involvement of other parties also aiming to comply with this Directive (e.g. tourist sector and other non-agricultural activities in rural areas). The number of stakeholders involved in research programmes has been widened including other Ministries, regional authorities, NGOs, the agri-business sector, extension services, and industry).

A selection of stakeholders contributing to the research programmes is presented in the following.

- In *Belgium*, stakeholders are involved through focus groups, workshops, in-depth interviews. New insights are created in this way that are useful for parties involved. They also get the opportunity to express their expectations towards the research.

- In *France*, partnership at a regional level between regional authorities, universities and research institutes is considered particularly important (PSDR). A multi-stakeholder partnership approach is also carried out with technical institutes, research institutes and professional players such as farming co-operatives, inter-branch organisations (CAS-DAR).
- In *Germany* current research programmes of the German RURAGRI partners enhance transdisciplinary research with scientists and stakeholders being on par with each other since this accelerates the understanding of existing problems and the transfer of scientific findings into practice. Consequently, stakeholders (companies, often SMEs, public bodies, private organisations and others) are very often active partners in cooperative research projects.
- In *Ireland*, projects with demonstrated stakeholder participation receive a higher evaluation.
- In *Israel*, stakeholders are involved in major steps (e.g. goals, evaluation and financing).
- In *Italy*, the drafting of the National Research Programme (PNR) where the R&D strategic priorities are specified and the financial instruments are provided always occurs through a wide consultation among ministries and with stakeholders, regional governments, farmer and industrial associations, academia and public/private research institutions. Regarding agriculture in particular, the identification of agricultural research needs and the definition of strategic objectives and actions are made through permanent consultation groups with farmers, agro-industry associations, scientific community and regional governments under MIPAAF coordination.
- In *Latvia*, the Ministry of Agriculture and stakeholders together define the priorities of research and the development of corresponding State research programmes. Representatives of the Ministry of Agriculture and stakeholders participate in the Supervisory Board monitoring the implementation of the State Research programme. SMEs and farmers are the primary end-users of the research results achieved. In *Lithuania*, research can be initiated by the Ministry of Agriculture, sectoral research steering committees, farmers' organisations, extension services or public bodies.
- In *the Netherlands*, regional authorities are in charge of implementing national legislation. Environmental conservation and nature management groups contribute their expertise in the research.
- In *Poland*, other ministries (e.g. Ministry of Science and Higher Education, Ministry of Environment) and regional authorities (including extension services) responsible for implementation of research programmes.

- In *Scotland*, stakeholder involvement is crucial to the aim of the programmes, and the research includes innovative approaches to involving a wide range of users including land managers, government policy-makers, delivery agencies, industry, and local communities.
- In *Sweden*, stakeholders are regarded as actors who can put the research outcomes to use in society, including government, authorities, industry and civil society, as a contribution to achieving sustainable development.
- In *Switzerland*, the main research programmes are accompanied by stakeholder forums.
- In *Turkey*, researchers who respond to the calls in the research programs are encouraged by MARA/GDAR to collaborate with relevant stakeholders. This is also part of the general agricultural research policy in Turkey. High priority is given to this type of projects. A good example is the genetic resource conservation programme for farm animals, in which researcher and farmers work together on the conservation of animals in their natural habitat.

3.3 Type of research in the programmes

Agricultural research in the domain of RURAGRI is very complex and diverse and there is increasing focus on multi-disciplinary and/or interdisciplinary research. The role of stakeholders has been substantially broadened and we observe an increasing interest in transdisciplinary research. This type of research seems promising because the knowledge of stakeholders is used in exploring options to solve economic, ecological and societal problems. This research approach requires a considerable change in the attitude of the research community, since the expertise from a wide range of actors is incorporated into the research. A considerable share of the research programmes includes multidisciplinary and/or interdisciplinary research, combined with some transdisciplinary research as well (although often on a smaller scale) (Table 3.3).

Table 3.3**Use of multi-disciplinary and transdisciplinary research approaches in the mapped programmes**

Country	Multidisciplinary research	Transdisciplinary research
Austria	Yes, with multi-disciplinary teams (economic, social and natural sciences) expand the boundaries of their disciplines and aimed to generate synergy	Yes, aimed for joint learning between scientists from different disciplines working together with user-groups. Non-academic parties are included
Belgium	Yes	Yes
Cyprus	No	No
Denmark	Yes, it is encouraged. However, there are considerable difficulties in organising and successfully carrying out multidisciplinary research projects	Not explicit
France	Multidisciplinary research is stimulated	Transdisciplinary programmes (e.g. CAS-DAR, PSDR and Systerra) are implemented, to respond to the complexity of issues, through partnerships between researchers and stakeholders
Germany	Yes	Yes
Ireland	Yes, but depends on the project rather than on the programme	Yes, projects focused on complex human-environment interactions i.e. agricultural practice tend to be multi- and transdisciplinary in nature
Israel	Yes, most of the projects are multidisciplinary	Yes, it is encouraged, but it is not an obligatory condition
Italy	Yes	Yes
Latvia	Yes	Stakeholders (industry and farmers) are potential end-users of obtained knowledge and results. However, they are not funded from the State research programme
Lithuania	Yes	Yes
Scotland	Yes, in all activities	A small component, but considered relevant to increase the quality and relevance of science

Table 3.3 Use of multi-disciplinary and transdisciplinary research approaches in the mapped programmes (continued)		
Country	Multidisciplinary research	Transdisciplinary research
Slovenia	Yes	Yes
Spain	Encouraged in the evaluation process	Encouraged, but difficult to implement in practice
Sweden	Yes	Yes
Switzerland	Yes	Yes
The Netherlands	Yes	Yes, but it is rather limited
Turkey	Yes	Yes. Researchers are motivated to propose transdisciplinary research

3.4 Core expertise in the consortium

Understanding the expertise in the consortium is crucial for future activities of RURAGRI. It is a basis to learn from each other and a starting point for the implementation of a joint call and other means to collaborate. Based on open questions in the national survey, Table 3.4 summarises the expertise in the consortium.

Table 3.4 Expertise in the consortium, expressed by the partners	
Country	Expertise
Austria	Rural areas, with broad scope integrating agriculture and rural development (mountain regions)
Belgium	Soil quality, farming practices, land use, institutions
Cyprus	Plant protection, plant improvement, viticulture, animal production, agricultural economics, post-harvest physiology, rural development, ICT in agriculture, agro-biotechnology
Denmark	Rural innovation, farm management; bio-energy, multifunctional agriculture
France	Rural areas; integrated ecosystem approach; regional-local authorities; soil quality; climate change; farming system
Germany	Sustainable land management, rural-urban relationships, land consumption, climate change, land use, governance
Ireland	Rural economy, farm diversification, rural areas, rural populations

Table 3.4		Expertise in the consortium, expressed by the partners (continued)
Country	Expertise	
Israel	Sustainable regional & rural development – based on public participation, empowerment of peripheral rural regions and communities, growth of rural communities	
Italy	Sustainable production and farming system, management of natural resources, plant protection, plant and animal breeding, fruit production and post-harvest techniques (including viticulture and oliviculture), animal and dairy production, agricultural economics, quality for human nutrition, ICT in agriculture, climatic change, rural development	
Latvia	Sustainable management of natural resources, land use (agriculture, forestry), rural development, bioenergy, biofuel, biomass	
Lithuania	Soil quality, regional and rural development, food safety, animal breeding	
Scotland	Crop sciences; animal sciences ; land use; farming systems; soils; catchment management; biodiversity; climate change; rural development	
Sweden	Research for sustainable development, including organic production and rural development	
Switzerland	Soil quality, urban-rural relationships, multifunctionality of farming	
The Netherlands	Innovations in agriculture ; biodiversity and landscape; climate change; land use; quality of soil, water and air	
Turkey	Regional and rural development, biodiversity and ecosystems	

3.5 Procedures for the implementation of the research programmes

Examples are presented on the implementation of the research programmes for different steps of the funding mechanisms. We will present how the steps are performed by some RURAGRI partners.

3.5.1 Selection of topics

- In *Israel*, the objectives of a call for proposals are determined by MOARD and are based on national priorities and determined by consultation with experts from research institutes, industry and representatives of farmers' organisations.
- In *Turkey*, the priorities of agricultural research areas are determined by the integrated efforts of MARA/GDAR, universities, Scientific and Technological

Research Council of Turkey (TUBITAK), State Planning Organization, business sector and NGOs. Areas of research opportunities are considered through their: (i) potential benefits to Turkey, (ii) ability to capture such (economic, social or environmental) benefits, (iii) R&D potential, and (iv) R&D capacity.

3.5.2 Launch of call

- In *Turkey*, in the GDAR proposal submission system, there is no specific call for proposal. The Research Master Plan indicates the proposal submission and evaluation schedule. The system is open to the scientists from public and private research institutions, universities and private sector to some extent. Every year, more or less on the same date, project proposals are prepared by using a prescribed format and are then submitted to the Institute Research Committee to start the evaluation process. The work researchers set out in the proposal must correspond to one or more of the priorities topics indicated in Research Master Plan.

3.5.3 Selection of proposals

- In *Switzerland*, the criteria for the selection of proposals are:
 - (i) target conformity;
 - (ii) scientific quality and originality;
 - (iii) application and implementation;
 - (iv) interdisciplinarity and transdisciplinarity;
 - (v) cost-effectiveness and
 - (vi) personnel and infrastructure.
- In *France*, proposals are evaluated in two steps. First, through an evaluation committee (providing an evaluation report). Second, through two external experts. Criteria are: (i) relevance of the proposal and adequacy to the call, (ii) scientific and technical excellence, (iii) methodology, project implementation and management, (iv) impact of the project, (v) quality of the consortium, (vi) adequacy between project and means.
- In *Turkey*, at the beginning of every year, to determine research priority areas and research programmes, researchers from GDAR institutions prepare one or more project proposals. The project proposals are firstly evaluated by Institute Research Committee. Project leaders or coordinators of positively evaluated proposals are invited to represent them at a Programme Evaluation Meeting, in which directors and researchers from research institutes, scientists from universities and representatives from other related stake-

holders participate. Next, proposals are subjected to the evaluation and scoring procedures done by five Research Scientific Committees (Field Crops, Natural Resources, Food, Horticulture, Aquaculture and Livestock) with respect to:

- relevance of the proposal to the aim;
- co-operation level with universities, private sectors, farmer unions, et cetera;
- economic benefits;
- return to investment;
- originality;
- material and methods;
- competence of researchers;
- competence of institutes;
- experience of institutes.

As the final step, proposal and evaluations are reviewed by 'Agricultural Research Council' comprised of high level administrators of MARA, scientists from universities and representatives of other stakeholders. Considering the decisions of the Council, GDAR gives permission to the Research Institute to realise the work or to reject it.

3.5.4 Monitoring of research

- In *Italy*, projects are monitored by experts appointed by MIPAAF, according to a monitoring plan.
- In *Turkey*, in GDAR, Research Master Plan requires the Head of Departments of GDAR to monitor the implementation of the projects. Project monitoring (combination of data and document review and onsite visits of the projects) is executed by a monitoring group called 'working group'. After onsite visit the working group prepares a report and sends it to the Research Scientific Committee. On the other hand, project leaders have the responsibility to prepare a 'progress reports' and to send it to the Research Scientific Committee twice in a year.

3.5.5 Dissemination of results

- In *Germany*, project results are disseminated on various levels. Dissemination of project results may be scientific, as well as commercial or for the public. Beneficiaries need to hand in an exploitation plan as early as with the project application. The exploitation plan comprises both scientific as well as

economic perspectives of the project results. Publication of project results in journals is a precondition.

- In *Italy*, the transfer of knowledge is ensured by publications (scientific and popular), workshops and meetings not only addressed to the scientific community, but also to public administrations (national, regional or local), technical officers, stakeholders. The transfer of innovations to farmers is under the jurisdiction of Regions and local authorities. This task is carried out in cooperation with farmers and producers' organisations, under specific regional regulations.
- In *Turkey*, research results are disseminated through formal channels and mass media. As an electronic media, web sites have been effectively used by GDAR and research institutes recently. The Ministry publications are the most important channel for disseminating research results to different users located throughout Turkey. Special publications such as leaflets, brochures, books, progress report of the research activities and their results are employed. In addition, The General Directorate of Organization and Support (TEDGEM) and its Department of Agricultural Extension are primarily responsible for the planning and managing of agricultural extension activities throughout Turkey on behalf of the Ministry.

3.6 Relevant European research programmes and network activities

The survey mainly covers the national research programmes. However, the Framework Programmes are established in consultation with Member States and many partners in RURAGRI often contribute to this process. At least in part the research priorities in the Framework Programmes of the EC contribute to the objectives of the Member States. The research community also seeks to match opportunities for funding through the Framework Programmes with the research agenda in the Member States. We therefore developed a brief and selective inventory of the existing research themes in FP7 (Themes 2 and 6) in the area of agriculture - rural areas - sustainable development.

The objective of Theme 2 (Food, agriculture and fisheries, and biotechnology) is to support the development of a European Knowledge Based Bio-Economy. Activities that are relevant for RURAGRI include: Activity 2.1 (Sustainable production and management of biological resources from land, forest and aquatic environment) and Activity 2.2 (Fork to Farm: Food, health and well-being). Activity 2.1 includes areas focusing on:

- (i) increased sustainability of all production systems, plant health and crop protection;
- (ii) optimised animal health, production and welfare across agriculture and;
- (iii) socio-economic research and support to policies (quotation from Work Programme 2011, Cooperation Theme 2).

The strategic objectives of Theme 6 (Environment, including climate change), are to promote sustainable management of the natural and human environment and its resources [...] knowledge on the interactions between the biosphere, ecosystems and human activities [...] Activity 6.2 (Sustainable management of resources and more specifically sub-activity 6.2.1 (Conservation and sustainable management of natural and man-made resources and biodiversity) will contribute to the strategic objectives by focusing research activities on the need to generate [...] models and tools needed for: (i) the sustainable management of resources, (ii) the protection and sustainable use of ecosystems [...] Research [...] contributing to the development of ecosystem-based management approaches, which requires multidisciplinary and cross-cutting vision towards the natural resources, in particular soils, water and biodiversity (quotation from Work Programme 2011, Cooperation Theme 6). Research in Activity 6.3 (Environmental technologies) and more specifically sub-activity 6.3.1 (Environmental technologies for observation, simulation, prevention, mitigation, adaptation, remediation and restoration of the natural and man-made environment) will help contribute to the decoupling of economic growth from resource depletion and environmental pollution leading to improved eco-efficiency in comparison to traditional technologies (quotation from Work Programme 2011, Cooperation Theme 6).

The Trade and Agriculture Directorate of OECD includes a unit on sustainable agriculture, working on: (i) agri-environmental indicators and policies, (ii) research programme on biological resources in agriculture. Indicators are used to analyse and measure the effects on the environment of agricultural and agri-environmental policies. More information about publications and statistics is provided on the website of the Trade and Agriculture Directorate in OECD (<http://www.oecd.org>).

The Research Programme on Biological Resources in Agriculture awards research fellowships and sponsors conferences in the field of: (i) the natural resource challenge, (ii) sustainability in practice and (iii) the food chain. The multidisciplinary agri-food research aims to strengthen the scientific base of policy. See also the website : www.oecd.org/agriculture/crp.

There are many initiatives for Networks and actions in the field of rural areas and sustainable development (e.g. the partnership for rural Europe, PREPARE, website: <http://preparenetwork.org>).

A European Network for Rural Development (EN RD) was established in 2008. This Network is aimed to support the efficient implementation of rural development programmes (website: <http://enrd.ec.Europe.eu/>). EN RD is an integral part of the LEADER Program.

The European LEADER Association for rural development (ELARD, website: <http://elard.eu>) is a Network sharing experiences and ideas to implement the LEADER programme in Europe.

We have observed some examples of bilateral cooperation between research organisations in Europe supported by national Ministries of Agriculture (e.g. the Polish programme for international cooperation can be found at the website: <http://www.nauka.gov.pl/ministry/international-cooperation/>). However, some countries reduced bilateral cooperation in the recent past (France, Poland, and the Netherlands). A major argument might have been an availability of European funding through the research programmes of the European Commission, reducing the need to promote bilateral cooperation.

4 Main topics for future cooperation

The survey mainly maps existing research programmes. This of course is meant to be a basis for exploring joint calls. However, we considered it essential to also identify possible topics for future cooperation at this stage of RURAGRI. This bottom-up approach will also be the input for further activities of RURAGRI (Table 4.1).

Table 4.1 The indicated topics for future cooperation of RURAGRI partners	
Topic (number of responses)	Response by countries
<i>Ecological dimension</i>	
Landscape, biodiversity, nature (10)	Austria, Belgium, Denmark, France, Israel, Italy, Poland, the Netherlands, Sweden, Turkey
Management of natural resources, ecosystem services (15)	Austria, Belgium, Cyprus, Denmark, France, Germany, Hungary, Israel, Poland, the Netherlands, Scotland, Spain, Sweden, Switzerland, Turkey
Climate change (mitigation, adaptation) (10)	Denmark, Germany, Hungary, Ireland, Israel, Italy, Latvia, the Netherlands, Scotland, Turkey
<i>Economic dimension</i>	
Farming practices (8)	Italy, Latvia, Lithuania, Poland, the Netherlands, Scotland, Spain
Food security, safety, consumer behaviour (10)	Austria, Cyprus, Hungary, Ireland, Italy, Latvia, Lithuania, Poland, Spain, Turkey
Land management (12)	Belgium, France, Germany, Hungary, Ireland, Israel, Lithuania, Poland, the Netherlands, Slovenia, Sweden, Switzerland
<i>Societal dimension</i>	
Rural and urban areas (11)	Austria, Belgium, Cyprus, Denmark, France, Germany, Italy, Lithuania, Scotland, Slovenia, Switzerland
Cultural and demographic trends (6)	Austria, Germany, Slovenia, Sweden, Switzerland, Turkey
<i>Institutional dimension</i>	
Institutions and governance (4)	Belgium, France, Germany, Ireland

5 Conclusions

5.1 Main topics of the research programmes

The research capacity has a long tradition to better understand linkages between agriculture and sustainable development. We observed strong positions in the current national research programmes on topics such as: (i) soil, water and air, (ii) landscape, biodiversity and nature, (iii) farming practices, (iv) land management. More recently the research capacity at the interplay between agriculture and rural areas has been strengthened in the topics such as climate change, rural and urban areas and institutions and rural governance. The topics considered relevant for future cooperation by the RURAGRI partners (e.g. ecosystem services, consumer behaviour, and rural and urban linkages) are largely at the intersection of agriculture, rural areas and sustainable development.

Different approaches have been used for the identification of topics in the existing research programmes and the topics proposed for future cooperation in RURAGRI. A considerable number of research programmes has been reviewed and a set of key topics in running projects has been selected. The 5 most important topics were selected by the partners. In addition, all partners were invited to propose 5 topics for future cooperation. This was based on interviews and several of the partners only partly responded to this question. More responses were received for the current research programmes than for future cooperation topics.

The highest scores in the existing programmes were on the topics of climate change (16), land management (16), landscape and biodiversity (15), farming practices (15) and land use (15). These are topics that have a high policy profile and major scientific challenges for agriculture in the broader context of rural development. The highest scores in the topics proposed for future cooperation are management of natural resources and ecosystem services (11), rural and urban areas (11), landscape, biodiversity and nature (10), food safety and consumer behaviour (10).

These topics seem far more complex than the topics in the existing research programmes, with a broad coverage in the fields of agriculture, rural areas and sustainable development. This seems to be in line with the demand for hands-on solutions to societal problems. It also seems to indicate the current programmes hardly cover these complex aims.

The synthesis report covered the available research capacities, facilities, databases, technology platforms and both national and international funding opportunities for collaboration. This is explored in the national surveys and we recommend taking this into account when planning research initiatives or joint calls.

5.2 Next steps – from research programmes towards a research Call

The mapping of the national research programmes was input for the Expert Meeting that was held 21-22 March 2011. This meeting provided an important step towards the Strategic Research Agenda (SRA) which is due for the end of 2011. The SRA will put national research programmes into a European perspective.

The results of the mapping exercise will be input into a common Strategic Research Agenda that will be taken forward by means of jointly funded programmes. RURAGRI will elaborate a European research agenda on the stakes of sustainability and the new challenges faced by agriculture in a changing rural context. Two research priorities relate to (i) scarcity of resources, ecosystem goods and services and the increasing competition among them, and (ii) the socio-economic activities in rural areas and the valorisations of the resources. Other research priorities deal with the interrelationship and management of the resources and the management of land. The SRA is due for the end of 2011.

The countries participating in RURAGRI have identified research needs and priorities, and three main thematic areas are identified:

1. Ecosystems and public goods
2. Rural socio-economic issues
3. Land use management

Within each of these thematic areas, a range of research topics have been identified. The Call is scheduled for 2012.

Appendix

Country profiles of the research programmes

Austria

In addition to the general research activities of the Federal Ministry of Science and Research (BWF) the Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW) has specific responsibility for applied research supporting the federal government in the field of agriculture, forestry, environment and water management. The research priorities are expressed in the Research Programme of the Ministry under the term 'PFEIL10' (2006-2010), which supports precompetitive research projects mainly through multidisciplinary research questions, and in interaction with rural stakeholders or local communities (www.dafne.at). As the rural areas are of extraordinary relevance in Austria, rural development issues are of particular concern. The high national relevance of these issues can be exemplified by the share of the population living in rural areas (about 78% of the total national population) and its significant function for settlement, economic activities, recreation and use of natural resources, and environmental concern. Research in this field is relevant to the application of the Rural Development Programme, which shows a particularly high national priority and a comparably high funding intensity, and support for various economic and spatially oriented regional policy schemes carried out within the Austrian provinces. Consequently there is also a funding line within PFEIL10 that is carried out in cooperation with regional governments, the so-called 'Bundesländer', which is financed through the research cooperation of the federal state with the regional governments.

The aims of the national programme PFEIL10 focuses on a wide range of research activities, reflecting the large scale of tasks of the Ministry. Rural development and sustainable use of resources is a strategically important part of it that has gained in relevance in the last two research programme periods. The current programme PFEIL 10 focuses especially on: (i) the improvement of the information base and the analysis of developments in rural areas, (ii) issues of rural development programmes application and respective contribution to land use planning, including integrative processes and spatial inter-relations, (iii) economic, ecological and social assessment and evaluation of rural development programmes and the provision of public services, (iv) securing the readiness for

production of the soil and networking agriculture and nature conservation, (v) assessment of international framework conditions (Natura 2000, CBD, Alpine Convention) on rural areas, and (vi) information and creation of awareness among the agricultural and non-agricultural population.

The research strategies are focused on the national specific situation of rural areas. As Austria is one of the European countries with the highest share of mountainous regions (70% of the national territory) research addresses the analysis of social and economic conditions in structurally disadvantaged regions and models for integrating economic activities, while securing ecological diversity at the same time. This last item is particularly important for the sensitive environmental zones (of the mountain areas) and strengthened by climate change impacts. Research on implementation strategies therefore includes the elaboration of environmentally compatible and close-to-nature forms of production and management, the elaboration of adapted production and processing methods for farm management in mountain areas giving special attention to quality improvement, and measures for securing grassland management as well as mountain pasture and pasture management.

The main issues of concern in the research programme include the various dimensions of agricultural management within a perspective of sustainable development and taking account of rural development potential. As such the programme targets a multidisciplinary and trans-disciplinary approach in its application. Specific priorities in the ecological dimension are flood prevention and protection measures and climate change aspects; in the economic dimension, the focus is on land use issues for agriculture, forestry, tourism development and inter-linkages of these, as well as economic development of forest management, and in the social dimension a spatial view on the opportunities of rural areas.

BMLFUW, the Austrian responsible institution for applied research for the relevant research, has specific priorities with regard to RURAGRI tasks. The research programme PFEIL10 complements research that is carried out by research institutes belonging to the Ministry (BLMLFUW) and by several research institutes with a basic support by the Ministry. The research activities of these research institutions comprise the assessment of rural development issues, farm management aspects and environmental performance of land management and forest development. Although the interest for rural development aspects has increased and respective research priorities were strengthened, there are a number of research questions that cannot be covered by a small country's research programme. Joint research programming hence is an opportunity to address these. They include in particular: Rural development policy assessment,

regional governance and impact analysis, agricultural structures interrelation with rural economies, the increasing geographical and economic scope of production chains, linkages to job creation and regional innovation.

A number of important research questions cannot be covered by a small country's research programme. Joint research programming hence is an opportunity to address these. They include in particular: Rural development policy assessment, regional governance and impact analysis, agricultural structures interrelation with rural economies, the increasing geographical and economic scope of production chains, linkages to job creation and regional innovation. The approach in trans-disciplinary research will also be seen as a research topic in itself. Issues not covered at the national level include changes of food consumption patterns, health prevention in relation to food development, and global aspects of agricultural production and trade, as well as global influences on rural development issues.

A series of topics can be seen as interesting issues for joint research, including a balanced selection of activities and interrelated structure of programmes taking account of all three dimensions of sustainability. The Austrian context suggests activities in several spheres which sometimes cannot be related to just one of the following items: a) studies to secure the agricultural production in 'disadvantaged' areas (such as mountain areas), including its impact on cultural landscapes; (b) the small-scale provision of goods and a high quality production of regional products; and (c) analysis of different development approaches, including scenarios, indicating the effects on different levels (global vs. regional/local level). Best-practice from existing transnational cooperation is an important source for these issues.

Belgium

The Institute for Agricultural and Fisheries Research (ILVO), which is the partner of RURAGRI, is a large agricultural research institute that is part of the Flemish department of Agriculture. Besides at this institute, agricultural research is done at several other research institutes and universities.

The Flemish Ministry of Agriculture is the main funding body of ILVO. The main aim of the funding body is to collect data as a result of applied research in a way that it should lead directly to policy advice. As main funding body, the Flemish Ministry of Agriculture benefits the most from the research. Additionally other policy domains such as spatial planning, environments, local govern-

ments, provinces, ... also have a direct benefit from the research results. It is a strategy of the Ministry of Agriculture to biannually design the main research programmes for ILVO, in cooperation with ILVO. To follow-up the research results, reports are exchanged between the researchers and the Ministry on a regular basis. The planned actions in the area of RURAGRI can be framed within 2 of ILVO's major research programmes. These programmes are called '*Agriculture in a natural environment*' and '*Agriculture in a dynamic countryside*', and they are part of a broader vision on future research within ILVO with a time-horizon until 2020 ('ILVO2020'). The contents and objectives of these research programmes were developed by a bottom-up approach in which all involved researchers could participate. Within these research programmes, the projects that are directed at policy support are reviewed on a biannual basis by two major commissions. The Ministry of Agriculture evaluates the policy relevance, and a group of scientists evaluates the scientific value of the projects.

The research topics within the ILVO2020 programmes that have an obvious relation with the RURAGRI topic are:

- For programme 6: '*Agriculture in a natural environment*':
 - Soil quality;
 - Genetic heritage of species;
 - Biodiversity;
 - Farming Practices;
- For programme 8: '*Agriculture in a dynamic countryside*':
 - Land use (agriculture, forestry, tourism, ...);
 - Spatial conflicts;
 - Rural area;
 - Administration, institutions and governance (actors, instruments and organisation);
 - Ecosystem services.

ILVO itself has a 'double' nature. First of all, ILVO is a major research institute that receives funding from the Flemish government (particularly from the Flemish Ministry of Agriculture) and other funding bodies such as the Belgian Science Policy (BELSPO) and Institute for the Promotion of Innovation by Science and Technology in Flanders (IWT). The funding by the Flemish Ministry of Agriculture is a combination of two sorts of payment. Annually, a lump sum provides the wages for about the half of the total number of researchers. There is frequent interaction between the Flemish Ministry of Agriculture and ILVO to determine and evaluate the research that is performed with this funding. Biannually the main research programmes are designed in cooperation with the Ministry.

For on-going research, reports are given and contact is kept between the researchers and the Ministry on a regular basis. Next to this lump sum, specific projects are regularly commissioned by the Ministry of Agriculture. In this case an 'open call' is launched and ILVO has to compete with other research institutes (mainly universities such as Ghent University and Leuven University). Funding from the other governments or funding bodies is also assigned through open calls, where ILVO has to compete with other research institutes.

Secondly, ILVO has its own resources by doing consultancy, licence incomes and a national re-allocation of specific research funds from employment programmes. This enables the institute to develop research strategies and to fund research itself. ILVO has chosen to fund its own research by means of a system of PhD grants.

The research programmes of the PhD's are topic-specific, and the priority setting is based on the mapping of research needs in the framework of 'ILVO2020'. Every year, the procedure for PhD grants is launched by a project call. The application procedure is open, with full competition, for competent researchers. Candidates need to fulfil some criteria: they need to have the necessary and relevant diplomas, they must have the European nationality, they cannot be an employee by ILVO (except for temporary employees for less than one year), they must have an attest of irreproachable behaviour and they must show the willingness and commitment to write a PhD. Candidates have to write a project proposal for the selected topic. The proposed project must have a total duration of 2 times 2 years. Candidates and their projects are evaluated by an external evaluation committee. Programmes of selected candidates are evaluated after 2 years. A positive evaluation is mandatory for acceptance of the last 2 years of the project to be financed. After 4 years, the research should result in a PhD which is defended in front of a scientific jury at a university. It is also encouraged to publish the results in scientific journals and in relevant popular media. Co-financing of the project with European universities or other research institutions is also encouraged. For example, 2 year financing from the ILVO-PhD programme and 2 years co-financing from a university.

Concerning the main objectives of the research, 3 major pillars can be distinguished within ILVO. First of all there is research that should lead directly to policy advice, secondly there is research with a more fundamental nature, and thirdly, there are consultancy activities and advice directly to farmers and industry. Because most of the research is done with a focus on policy advice, the majority of the research is applied research. Beside this, there are also funds for fundamental research. As ILVO groups a very diverse set of scientists it is multidisciplinary in its very nature. Since a considerable effort is being done to in-

involve stakeholders in the research as much as possible, ILVO goes beyond this organisational setting and also stimulates interdisciplinary research.

Next to the funds that go directly to ILVO, the Flemish Ministry of Agriculture also funds other research. The topics to be investigated are specified in the calls of the Flemish Ministry, but this is not embedded in standardised research programmes. Most of the national research programmes are competitive funds that are very broad and not restricted to specific topics such as agriculture and/or rural development in a context of sustainable development. Consequently, all national research programmes may cover all proposed RURAGRI research topics and no indication of relevant RURAGRI research topics per research programme can be given.

Cyprus

In Cyprus, the research policy is guided by the Ministry of Agriculture, Natural Resources and Environment, and by the Agricultural Research Institute. Following EU accession, agriculture in Cyprus is facing unique challenges and opportunities. The most important challenge for policy makers is to secure a competitive agricultural sector in a viable, sustainable and prosperous countryside. In this respect, the goal of the agricultural policy, both in the short as well as in the long-term, is to ensure stable conditions in the production process and to promote further agricultural growth.

The Research Promotion Foundation's core objective is the promotion of scientific and technological research and innovation in Cyprus. The specific objectives and priorities are as follows:

- To monitor and coordinate the scientific and technological research and innovation in Cyprus;
- To identify appropriate thematic areas for conducting demand-driven research, taking into consideration the developmental needs of Cyprus;
- To provide funding for the implementation of research and technological development projects and innovation activities;
- To promote the participation of Cypriot research organisations in European research programmes;
- To evaluate the potential of organisations or individual researchers for carrying out research;
- To advise the government on research issues;
- To upgrade the infrastructure for research activities;

- To promote awareness of the Cypriot public for the importance of research in contemporary societies.

The Agricultural Research Institute (ARI) conducts applied and basic research, with the objective to increase yield and improve quality of agricultural production by methods that are environmentally and socially acceptable. Its main activities include research in new crop varieties, trials for adaptation of imported varieties to the local environment. It is also involved in research on integrated organic agriculture, entomology, plant pathology, nematology, weed control, insect toxicology, soil fertility, plant nutrition and water requirements. As the scientists employed by this institute are all highly qualified and experienced, it is ideally capable in acting as a research policy advisor on agricultural topics and in fact it is advising the Government and the agricultural community on related issues.

The current research priorities of ARI are: climate change, food security and food safety, animal welfare, CAP reform, rural development and the multifunctionality of Agriculture.

Denmark

The main objectives of the Danish research in agriculture and rural development are manifold and include government advice, advice to farmers and other rural stakeholders and advice to the industry. By tradition, the farmer-owned national advisory service translates research results into applicable advice to farmers. It is meant to strengthen the research areas and to stimulate a higher degree of multidisciplinary research. Likewise, there are a range of research programmes (described below) that encourage multidisciplinary research. However, in the actual research practice there are considerable difficulties in organising and successfully carrying out multidisciplinary research projects.

The Danish Research Policy Council believes this to be a positive development, but recommends the full implementation of the synergy of capacities expected following the mergers, and stipulates the importance of a coherent strategic approach within the 'farm-to-fork' perspective (DFR, 2010). In general, the universities receive a lump sum of money from the Ministry of Science, but this basic funding has gradually declined over the past decades in favour of competition-based research programmes offered by both the Ministry of Science and by the Ministry of Food, Agriculture and Fisheries.

For all Danish research institutions, funding for specific research programmes is, as a rule, being channelled through the Danish Research Councils (see www.fi.dk), which reviews applications for funding. However, for some programmes, funding can be found from other sources, such as private funding from foundations or corporations. Other examples of alternative funding is private-public partnerships such as found in industrial PhD fellow projects, where funding is partly private, partly public.

'The Green Development and Demonstration Programme' (GUDP) under The Danish Ministry of Food, Agriculture and Fisheries, DFIA, is established as one of the initiatives of the government's Green Growth strategy. GUDP is directed to the agriculture and food industry aiming to bring more coherence between research, development and demonstration of knowledge on food, agriculture, fisheries and aquaculture. Denmark has so far worked with research and innovation in a way, where each link in the chain from research to implementation of new knowledge and technologies are treated fairly isolated. The GUDP will, however, ensure holistic solutions that incorporate the entire chain from research to development of new knowledge.

The government has identified six key challenges for the food, which GUDP shall help to solve:

- A more sustainable crop production;
- A more sustainable livestock production with improved animal welfare;
- A more CO₂-neutral energy production in agriculture;
- A more market-driven organic production;
- A higher productivity and increased value creation;
- A more sustainable fisheries and aquaculture production.

The overall research priority of RURAGRI is framed by Green growth strategy, that at the one hand facilitates a sustainable development of a high productive and intensive Danish agriculture, combined with rural entrepreneurship and rural development. Besides the priorities of environmental friendly agriculture, water protection, biodiversity, et cetera new topics as high value products such as TERROIR and Nordic cuisine. New curses of income based on multifunctional agriculture and experiences economy. Exploring new sources of synergy effect in e.g. multifunctional biomass production and rural entrepreneurship, cooperation between enterprises in developing new models of complex mixed farming systems.

The research topics presented have a strong position in the Danish research programmes are linked to water quality both in relation to the biodiversity of aquatic environments and not least to drinking quality of our ground water resources. Another primary area is climate gas emission and biomass production and utilisation. A third general topic is rural development, nature conservation and entrepreneurship; these elements are closely interwoven in a Danish context while more than 60% of Danish area is agricultural land.

France

From now on, in RURAGRI, France is interested in developing a joint call that would be co-financed by: (i) INRA, in the continuity of the 'PSDR programme', (ii) Ministry of Agriculture, through the 'CAS-DAR programme', and (iii) ANR, through 'AgroBiosphère programme', the follow-up to 'Systema programme'.

Current research programmes

Initially, RURAGRI research themes have been analysed through a research programme named 'Agriculture and Sustainable Development' ADD (2005-2010).

Two main questions were explored:

- What is the role of agriculture in sustainable development?
- What research needs can shed light and open new opportunities in a sustainable development context?

These questions initiated 3 current French research programmes in the scope of RURAGRI: PSDR, CAS-DAR and Systema. At a French level, three other EU activities (ARIM-NET, BIODIVERSA and CORE-ORGANIC) are structured around the same themes. One challenge will be to identify the core specificity of RURAGRI with regard to on-going research.

1. *PSDR 3. Pour et Sur le Développement Régional (2007-2011)*. For and Over Regional development. *INRA*.

During the past ten years, orientation partnerships at regional level have become more important in France. PSDR involves researchers, agricultural and non-agricultural partners. This programme is focused on local development issues in 6 French 'regions'. PSDR is an interdisciplinary research programme on

French regional development. This programme analyses territorial dynamics and the role played by agriculture and rural lands. The *4 main research themes* are: (i) technical and structural changes of agriculture, forestry and rural activities; (ii) general transformations of the organisation of agri-food activities; (iii) rural and peri-urban land use changes and adaptation of the population; and (iv) environmental resources management and sustainable development.

2. *CAS-DAR. Appel à projets de développement agricole et rural d'innovation et de partenariat (2009-2013)*. Joint calls on agricultural and rural development and partnerships. *Ministry of Agriculture*.

The aim of CAS-DAR programme is to foster innovation to meet the challenges of performance and competitiveness of agriculture compatible with the principles of sustainable agricultural practices. The call shall allow to: (i) encourage innovation, (ii) create conditions conducive to the development of innovation processes, and (iii) improve the efficiency of the agricultural and rural development. In 2010, there are 3 priorities: (i) Input efficiency and adaptation of production systems to reduce impacts on the environment and biodiversity, (ii) Dissemination of new approaches valuing farms using production methods particularly environmentally friendly, and (iii) Adaptation of quality products to markets and improving trade efficiency by supply chains organisation.

3. *Systema - Programme Ecosystèmes, Territoires, Ressources Vivantes et Agricultures (2010)*. Ecosystems, Territories, Living resources and agriculture. Agrobiopshère (2011-2013). *Agence Nationale de la Recherche*.

The programme promotes integrated approaches of ecosystem functioning, service users in France and in the South. Three objectives: (i) Improve systems of resource management. Create a new integrated management of multifunctional ecosystem technologies. Develop decision-making procedures, collective governance and public policies instruments to encourage broader participation; (ii) Respect stakeholder's diversity. Stakeholders group should be involved in ecosystem management strategies. The stake of research is to address issues globally concerning agriculture, forestry, aquaculture, fishery, North-South, urban-rural cleavages; and (iii) Integrate many action levels, related to processes from different spatial and temporal scales. Four thematic axes: (i) The ecological intensification of production systems; (ii) Ecological engineering of landscapes and 'territories'; (iii) New types of management and governance; and (iv) The development of new paradigms and new methodologies.

With regard to the international research strategy, this French proposal towards RURAGRI is in keeping with the general pattern of the JPI FACCE¹. The Scientific Research Agenda of the JPI describes five core research themes, and this proposal is deeply linked to two of them:

- Environmentally sustainable growth and intensification of agricultural systems under current and future climate and resource availability;
- Assessing and reducing trade-offs between food production, biodiversity and ecosystem services;

With regard to the French research strategy, this proposal is based on the relevant work realised by the French Alliance for the Environment, AllEnvi. This alliance created in 2010, gathers the twelve main organisations, including INRA, in this field. AllEnvi was appointed by the Ministry of Research (MESR) to re-structure French Research. AllEnvi's main objective is to identify research priorities.

AllEnvi is divided into 14 thematic groups. To write this proposal, principally we have used the contribution of two of them: 'Territoires et ressources naturelles', and 'Agroécologie et sol'. These 2 thematic groups have pointed out some scientific challenges, the disciplines and the research communities to target, and future research infrastructure needs.

Interesting topic for joint research in RURAGRI

Keywords: Rural development and natural resources; ecosystem services; management and evaluation of agro-ecosystems; rural-urban relationships; governance and regional-local authorities.

France is interested in the combination of these 2 topics for joint research at a European level.

a. Territories and natural resources

In France, every day, 160 hectares of valuable greenfield sites are converted into housing, factories, and traffic areas - this is equivalent to 200 football pitches. Furthermore, natural resources including water, biodiversity, ecosystem services, soil, and mineral resources have been deteriorating over the last few

¹ Joint Programming Initiative Agriculture, Food security & Climate Change (FACCE, <http://www.faccejpi.com/>)

decades. So, France seems relevant to examine the parallel between land consumption and the evolution of natural resources. In this context, 3 fields of research, at the crossing of local economic and social development and natural resources, are worth being analysed at a European level:

- *The interrelationship between rural development and natural resources*

In a context of unequal distribution of population and human activities, our objective is to identify how distinct European rural areas behave towards natural resources (local or extra-local). At the same time, studies on the evolution of natural resources should be realised at the scale of these particular rural areas.

- *Public/private actors and the uses of natural resources*

Because of the mobility of people, goods, information and lifestyles, rural areas are experiencing profound mutations. Residential demand is growing as the attractiveness of farming as a career is decreasing. Europe faces land use conflicts between local and extra-local actors for the use of local natural resources. Competing land uses, and sustainable development are closely interrelated. This field gathers several aspects such as: local competition, conflicts, local knowledge, social practices and uses of resources, identification of the value of the resources, resource management tools ...

- *Local uses and pressure on natural resources*

One key element is to monitor natural resources and their uses simultaneously. These data will help to identify and to quantify the services provided by the environment and their effects on the regional development. Another key element would be to analyse the adaptive ability of natural resources in view of external pressures. This field of research is situated at the interface between economic/social local development and local evolution of natural resources. One challenge would be to connect the different scientific communities spread across Europe. Another challenge would be to gather data from different sources (local observation posts, satellite, sociological survey ...).

b. Agroecology

As ecosystems are being deteriorated, Research is highly solicited to set up environmentally efficient and operational actions. It is admitted that agriculture can contribute to the sustainable management of ecosystem services. Some ecosystem services affect directly the agricultural production, whereas others are

related to the sustainability of agriculture, and other services have no direct and identified link with the agriculture.

Integrating agronomy with ecology concepts will allow us to understand the interrelationship between agriculture and ecosystem services. France promotes transdisciplinary research in agro-ecology, the convergence of agronomy and ecology. The principal objective is to develop region-related researches to adapt agro-ecosystems, in a way that is both productive and natural resource conserving. There are 3 domains:

- *Ecological services and the production of agro-ecosystems*

Firstly, this field includes the analysis of the biogeochemical cycles and their relationships with the agro-ecosystem productivity. Secondly, knowledge on ecological processes should be integrated in a landscape mosaic.

- *The conception, the management and the evaluation of agro-ecosystems*

We aim to develop multi-criteria models of agro-ecosystems to make agriculture more sustainable in a region. How can we conciliate agriculture and sustainable resource management? Some aspects are important such as: the evaluation of ecosystem services, natural resources regulation, waste regulation, ecological engineering, and rural innovation systems. Technologies related to agriculture should evolve towards ecological intensification.

- *Actors, practices and organisations*

Our aim is to work in synergy with regional and local authorities on an integrated ecosystem approach for the management of land resources. Research should offer new interdisciplinary ways, including legal framework conditions, to face the problem of agro-ecosystems sustainability. For instance, we should tackle: collective actions dealing with agro-ecological practices at a local scale, land use policies, and public policy tools in favour of ecosystem services.

From a scientific perspective, RURAGRI is a good opportunity to open a new field of research on the diversity of ecosystem services and rural areas, in Europe. Achieving critical mass of transnational research efforts at a global European level, France is convinced of the scientific added-value to cooperate within the fields of agriculture, rural areas and sustainability. To develop key scientific orientations, France expects a constant dialogue between social sciences, agronomy and ecology. Research is necessary in each of these 3 disciplines, but also trans-disciplinary innovations are requested.

Germany

This summary report outlines the funding activities of BMBF (Federal Ministry of Education and Research, represented by its 'Resources and Sustainability', RURAGRI partner no 6) and JUELICH (Projekträger Jülich (PTJ), Forschungszentrum Jülich GmbH (FZJ); RURAGRI partner no 7).

It is essential to note that the description of German research project funding activities in the scope of this report focuses on those funding activities which: a) are in the responsibility of the German partners as either being the programme owner (BMBF) or the programme manager (JUELICH) and b) are of interest in the scope of RURAGRI activities. Consequently, it is important to note that far more research activities are performed in Germany which, regarding their research topics, are related to RURAGRI activities. A complete description of these funding activities would exceed the scope of this report. However, the national report offers links to other research activities (programmes, programme owners, research institution).

Three funding activities being in the responsibility of the German partners have been identified that are relevant within the scope of RURAGRI. These funding activities are: a) 'Sustainable Land management - Module B: Innovative system solutions for sustainable land management', b) 'REFINA - Research for the Reduction of Land Consumption and for Sustainable Land Management' and c) 'Sustainable Forestry' including ERA-NET WoodWisdom-NET. While b) and c) are terminating funding activities, a) has just started and will run until approx. 2015. Altogether, these funding activities span over a period of more than 10 years. The overall funding of these three activities is more than €100 m.

The main research topics of these funding activities in the last five years and in the near future are (list without any weighting of relevance): (i) land consumption, (ii) climate change (mitigation, adaptation), (iii) natural resource management, (iv) land use (agriculture, forestry, tourism, et cetera), (v) product quality, (vi) economic instruments, (vii) biomass, (viii) forestry, (ix) spatial conflicts, (x) rural-urban-relationships, (xi) administration, institutions and governance (actors, instruments and organisation).

The funding activity 'Sustainable Land Management' and the underlying framework programme 'Research for Sustainable Development' will both be valid until 2015 and will thus be relevant during the life span of RURAGRI. The framework programme contributes to the target to strengthen the sustainable management of resources, consequently also supporting the high-tech strategy of the Federal Government. The framework programme aims at innovative

solutions from industry and science in order to cope with global challenges such as climate change, increasing world population, globalisation of the economic system, demographic changes, migration, agricultural and energy markets, et cetera. Global change results in different, often conflicting, and increasing demands on land use and therefore increases competition in the use of limited land resources. Holistic concepts are required which take into account ecological, economical and socially relevant issues. The funding activity 'Sustainable Land Management' is therefore defined as a cross-sectional issue.

The framework programme emphasises the importance of regions for being in the focus of research due to various reasons:

- a) The region as a level of integration. Ecological, economical and socio-cultural effects of global change converge concretely (e.g. limitation of water availability, increased cultivation of cash crops, changing life styles and consumption patterns) and thus enable the integrative consideration of the factors;
- b) The region as the central level of action. Decisions on land use are taken at the local/regional level, so it is here, where the final decision on the viability of a solution is made;
- c) The region as a level of participation. The consideration of regional stakeholders into research serves two purposes: (i) practical knowledge is made available for research and (ii) acceptance of research results is crucially increased. Both aspects support the need for transdisciplinary research.

The framework programme 'Research for Sustainable Development' has a national and international dimension. Both, the national and the international dimension are already covered by the funding activities through the call 'Sustainable Land Management'. Although the European dimension is already inherent, RURAGRI is seen as a chance to improve research activities and implementation in the European dimension.

Regarding joint activities and joint research within RURAGRI the main points of interest are the identification of new research questions that tackle aspects of the impact of global change for rural areas in a European dimension. Research questions need to be identified for cutting edges of different land use demands and different rural development aspects.

Referring to the topics for future cooperation the main points of interest of the German partners are: (i) rural-urban-relationships, (ii) land consumption, (iii) climate change (mitigation, adaptation), (iv) Land use (agriculture, forestry, tourism, et cetera), and (v) Administration, institutions and governance (actors, instruments and organisation).

It is expected that, on the one side, a better understanding of developments on the European scale by joining forces of the RURAGRI partners can be achieved. On the other side, flexible solutions which are viable for the future can be developed. By comparing different developments in different regions a deeper understanding of the relevant factors causing different rural developments can be developed. This in-depth understanding is a crucial basis to reduce spatial conflicts and to modify current regional developments caused by global change. A trans-sectoral approach, including rural-urban relationships, is therefore a precondition for outlining pathways to sustainable rural development. This is considered as a major point to handle upcoming challenges in the future. Reference for this consideration is taken from the 'Territorial Agenda of the European Union', which was agreed upon by ministers responsible for spatial development in the EU Member States in May 2007.

The identification of sustainable solutions to cope with upcoming challenges should be in the focus of RURAGRI. Since there is urgent need for action, processes and structures need to be established in order to transfer and implement research results quickly and efficiently into practice.

Hungary

In Hungary, there is a two tier research funding mechanism, complementing each other. First there are research programmes run in specific specialised research institutes under the governance of the appropriate Ministry, and second, (generally more modest) research programmes published, selected and funded by two general research funding organisations. It is important to mention, that Ministry affiliated research institutes are also eligible to submit proposals to the general research funding organisations.

Traditionally, agricultural research in Hungary is being coordinated by the Ministry of Agriculture and Rural Development (MARD). In 2007 MARD declared: 'Agricultural research in Hungary is currently undergoing an organisational restructuring and stabilisation with the coordination of MARD. The objective is to create an efficient agricultural research and development structure that would guarantee coordination between the agricultural research teams working under various organisational frameworks'. A key element pursued by MARD, based on the mid-term Scientific, Technological and Innovation Strategy of the Government, was to enhance the competitiveness by strengthening the relationship between the members of the economy and the R&D sector. In order to ensure

competitiveness of agricultural research & development and its application in practice, the Minister without portfolio responsible for research & development, head of the National Office for Research and Technology (NKTH) and MARD were intended to cooperate within the framework of a joint working group to establish the professional background required for agricultural R&D funding programmes. The following national programmes were supported through the above mentioned cooperation:

National Technology Programme

'The objective of the Programme is to help creating and maintaining a competitive agricultural sector, regarding the promotion of the development and application of products, processes and technologies according to the needs of the national economy and the World market'.

National Technological Platforms

'A Platform is a voluntary cooperation of public and private companies, research sites and other organisations in a given field with the objective of elaborating a joint strategic research plan in order to mobilise a critical mass of national, private and Community resources'.

Economy-oriented Agricultural Research

'The third call for the funding programme supporting economy-oriented and strategically important agricultural research & development is necessary in order to promote the competitiveness and sustainable development of the Hungarian agricultural sector and to ensure the application of the information and knowledge lately obtained'.

Young researchers' generation-change motivation programme

'Making researchers' career and profession more attractive by establishing a strong, internationally competitive Hungarian expert base is of outstanding importance and also means the key to success'.

At present, with a new Government elected in spring 2010, there are major restructuring in all fields of Hungarian Public Administration, including MARD. The new Research Department of the Ministry is still in process of being organised; therefore all MARD conducted research programmes except those run by the affiliated research institutes (discussed below) have been halted.

Ireland

Teagasc - the Agriculture and Food Development Authority - is the national body providing integrated research, advisory and training services to the agriculture and food industry and rural communities in Ireland. The organisation is primarily funded by State Grant-in-Aid through the Department of Agriculture, Fisheries and Food. As a consequence of this arrangement Teagasc research is aligned with a variety of policy initiatives.

National Policy Aspects to Teagasc' Research Programme

The funding allocated to Teagasc from the Department of Agriculture, Fisheries and Food to undertake research is not specifically allocated to particular research areas. Notwithstanding this, both researchers and research managers in Teagasc are keenly aware of current policy issues with the result that Teagasc is in a strong position to provide evidence based policy support to the Department of Agriculture, Fisheries and Food if requested to do so.

Funding provided through the STIMULUS and STRIVE programmes is more directly linked to both national and EU policy issues. The nature of these programmes, which provide funding over 18-36 months, enables policy makers specify key topics where they require additional research.

Aims and Strategies of Funding Agencies

The Department of Agriculture, Fisheries and Food is responsible for: providing policy advice on all areas of Departmental responsibility; to represent the State's position in international, especially EU, and national negotiations; to support the development and implementation of national and EU schemes in support of Agriculture, Food, Fisheries, Forestry and Rural Environment; to monitor and control aspects of Food Safety; to control and audit public expenditure allocated in to Agriculture, Food, Fisheries, Forestry and Rural Environment. The Department is also responsible for regulation of the agriculture, fisheries, and food industries through national and EU legislation; monitoring and controlling animal and plant health and animal welfare; monitoring and direction of State Bodies engaged in the following areas - research training and advice - market development and promotion- industry regulation and development- commercial activities; and directing provision of support services to Agriculture, Fisheries, Food and Forestry.

The Environment Protection Agency (EPA) is responsible for:

The provision of environmental licensing, enforcement of environmental law, environmental planning, education and guidance, monitoring, analysing and reporting on the environment, regulating Ireland's greenhouse gas emissions, environmental research development, strategic environmental assessment and regulation of waste management.

Agriculture, Rural Areas and Sustainability: National Visions and Strategies

The primary national strategy in place shaping the national and regional research programmes dealing with the new relationships between rural areas and agriculture in Europe and the challenge of sustainability is the Food Harvest 2020. <http://www.agriculture.gov.ie/media/migration/agri-foodindustry/agri-foodindustrypublications/2020Foodharvest190710.pdf>

This document sets out the vision that has been agreed by agricultural policy stakeholders. The vision foresees the development of a sustainable agricultural production system that supports increased productivity and profitability whilst simultaneously sustaining the rural environment and communities.

Teagasc's Research Priorities (2007-2013)

Over this period the focus will be on the implementation of the research vision programme with the establishment of the four centres of excellence. In conjunction with the advisory service an expanded technology evaluation and transfer programme utilising colleges and commercial farms will be implemented. The technology platform concept will be applied in the grassland area.

Livestock and Animal Bioscience Research

The major development here will be the establishment of the new Animal Bioscience Centre at Grange that will allow for the building of core competencies and critical mass in the scientific disciplines of animal metabolism, growth physiology, immunology, cellular physiology, and genomics and proteomics areas. This sub-programme will integrate closely with other sub programmes such as Genetic Improvement of Livestock, Animal Growth & Physiology, Animal Well-Being and Reproduction to exploit the potential that biotechnology and genetics now offers.

Crop Science

The period 2007-2013 will see the development of a bio-energy centre with increased research into the potential use of arable crops as raw materials for a non-food use such as novel chemicals, pharmaceuticals, energy and bio-fuels and biodegradable plastics. Research in plant molecular biology / biotechnology will focus on using molecular technologies such as gene mapping, gene markers and transformation to enhance the on-going Teagasc programmes in plant breeding, disease, and pest and weed control. Priority will be given to improving the productivity of perennial ryegrass, disease and pest resistance in potatoes, diagnosis of diseases and pests, and determining the agronomic performance of genetically modified crops and their possible impact on the environment.

Environmental Science

The period 2007-2013 will focus on the development of centre of excellence in soils and environmental research. This will involve the completion of the soil maps of Ireland and the development of new laboratories and the development of 'zero footprint farming systems'. The current research programme will undergo a full peer review in June / July 2008 and changes to the focus of the programme will be enacted thereafter.

Rural Economics

Over the next five years the research programme will focus on new agricultural activities such as biomass, bio-technology and agri-tourism, along with the interaction of the sector with the wider economy. An economic analysis of environmental issues will also be developed to support the organisation's environmental research programme.

Work on the analysis of trends and characteristics of macro agricultural commodity markets, industrial economics analysis of competitiveness and other issues in food and processing sectors and rural infrastructural assessment will be strengthened.

In the policy analysis area it is planned to link the RERC-FAPRI and RERC-SMILE models so that the impact of changes in agricultural and other markets can be examined in terms of the quality of life of rural households. It is also planned to expand the area of forecasts from purely agricultural to more broadly based rural economy issues.

Israel

The Ministry of Agriculture and Rural Development

Agricultural research in Israel is carried out by the public and the private sectors and is primarily funded by the public sector (85%), of which the Ministry of Agriculture and Rural Development (MOARD; www.moag.gov.il) provides the major share (approximately €50 million in 2009, the major part of it associated with plant science research). Other sources of funding include national, bi-national and international funds. The farming sector funds research through the production and marketing boards, and the Farmers Organization. The private sector funds the other 15% of the agricultural research, which is carried out mainly by manufacturers of agriculturally related products (e.g. fertilisers, seeds, irrigation equipment, pesticides, et cetera) and is partially supported by the Office of the Chief Scientist (OCS) of the Ministry of Industry and Trade.

MOARD Chief Scientist's major goals are to identify agricultural problems in which knowledge gaps exist, to determine research goals aimed to bridge such gaps, to fund such research activity and to monitor research performance.

Financial support is given for research programmes within ministry units as well as to universities and other research centres.

The major subjects that are currently supported and controlled by MOARD Chief Scientist are:

- Agricultural biotechnology and its regulation;
- Animal and Aquaculture production;
- Coping with foreseen agricultural threats arising from possible future climate changes;
- Economical, marketing and rural development policy;
- Food safety and quality;
- Horticulture and ornamental molecular and conventional breeding and production of new varieties for exportation;
- Irrigation and water management (potable; brackish; recycled; desalinated);
- Marketing driven R&D for new agricultural products;
- Organic farming;
- Pest management aimed at reducing the use of pesticides and herbicides;
- Post-harvest improvement of shelf-life and surface transportation of exported fresh agricultural products;
- Reducing man-power needs by improved and innovative technologies;
- Sustainable agriculture.

Rural development is one of the research subjects supported by the Chief Scientist of Agriculture, together with research in the field of Agricultural Economics and Marketing. The number of research projects funded in these fields is relatively small, about two to three per year. Research priorities in recent years focused on socio-demographic and institutional changes in rural settlements and agritourism.

Italy

The Ministry of Agricultural Food and Forestry Policies (MIPAAF) is the main funding body for agricultural, agri-food, forestry and rural development issues. It is responsible for the definition of national research programmes in all these areas, under the provision of the general long-term law for Agriculture (no 499, year 1999) and other following laws aimed at reinforcing and improving the sector in a broad sense (among others, the broad law on agriculture n°38/2003). To identify agricultural research needs and define strategic objectives and actions, permanent consultation groups with farmers, agro-industry associations, scientific community and regional governments are always in force.

The amount of the resources for the agriculture sector including agricultural research, is yearly defined in the financial law.

It is the duty of MIPAAF general Direction of the Competitiveness for the Rural development (COSVIR) with its 'Research and experimentation' Office (COSVIR IV) to promote and fund national research programmes and projects with duration of several years, investigating problems related to all aspects of a specific production chain (cereals, fruits, vegetables, industrial crops, et cetera) including food quality, cross-cutting issues (soil-water-energy management, plant nutrition, plant pathology, mechanisation, product transformation technologies, rural economy), forestry.

The users of these funds are CRA (Research Council for Agriculture), Universities and any other public or private (non-profit) research body, having in its constitution act the research as institutional activity. In particular part of the funds are devoted to support CRA in the ordinary activity and for the permanent staff salaries.

In the recent years other financial instruments devoted to different agricultural sectors have been used to support agriculture research considering that research is a key point to improve the competitiveness of each sector, e.g. funds devoted to the young farmers (to improve the connection between re-

search and the innovation need), funds for flowers and ornamental plants production in connection with research, funds for organic farming and food.

MIPAAF also contributes to scientific education and research training financing fellowships, grants and contracts for young researchers using also additional resources to the projects' budgets. MIPAAF can also fund PhD grants under an agreement with University (defined case by case). The main objective of the research is to increase the competitiveness of the sector addressing the results as far as possible to the end users (farmers and consumers); it is mainly applied and multidisciplinary research. In some case financial resources devoted to increase the competitiveness of a specific sector can be used to finance research, enforcing the link between the stakeholder and the research system.

Latvia

Cabinet of Ministers of Republic of Latvia has accepted the 'Guidelines for Development of Science and Technology for 2009-2013' (further - Guidelines) to determine the policy targets in this field and to promote the development of knowledge-based society in Latvia. To reach the policy targets, the Guidelines include the following tasks:

- to promote the renewal and capacity of human resources and infrastructure by the development of universities as competitive research and technology centres and by strengthening of other research institutions in country;
- to ensure substantial growth of public investment in research and development by achieving that the mechanism for funding ensures increase in the attraction of private investment;
- to enhance the competitiveness of Latvian research in the international level by promoting the collaboration in research and technology development,
- to facilitate the knowledge and technology transfer by the development of institutional environment and support activities to promote public and private partnership.

To ensure the human resources in the research and development Latvia has improved the system of doctoral grants and scholarships and has established the postdoctoral research support system co-funded by EU Structural funds. An essential part of EU Structural funds have been used for the modernisation of infrastructure in research institutions that will stimulate the returning of researchers to their laboratories from abroad, too.

One of the tasks is the regular determination (once every 4 years) of priorities in research. Such approach was started in 2002. The current 5 priorities in research have been determined for the period 2010-2013 and corresponding State research programmes in applied research have been funded.

Implementation of State research programmes provide integrated solution of complex and current economic problems, involvement of experts in various branches of science and efficient application of material and technical resources of scientific institutions. State research programmes represent government commissioned scientific research in particular fields defined as national priorities, with the aim to facilitate development of this specific field. Ministry of Education and Science promotes competitiveness of science and fosters implementation of targeted applied research by financing of these State research programmes. All programmes are targeted to the solution of actual socio-economic issues.

One of the State research programmes is targeted to the 'Investigation and sustainable use of local resources (mineral deposits of the earth, technologies for the acquirement of forest resources, technologies for the food production, transportation). The main objective of this State Research programme is to ensure the sustainable use of local natural resources'. This programme includes the investigation and elaboration of new products and technologies for their production. The studied resources are the entrails of the earth of Latvia, the resources of the forests, raw materials from local plants and animals. Besides the elaboration of proposals for the long-term development of transportation system has been planned. The programme unites the leading research and educational institutions in Latvia working in the fields of investigations of the entrails of the earth, forest, food and transportation.

There are 4 on-going projects in the mentioned State Research programme:

1. Elaboration of new technologies for innovative products from mineral deposits of earth;
2. New products and innovative management of forest, technologies for the production of wood products with added value, using the forest resources;
3. Sustainable use of local resources for the production of food with high nutritional value;
4. Development of safe and sustainable infrastructure of transport.

Projects 1-3 are relevant for the collaboration in RURAGRI ERA-Net project.

Lithuania

The knowledge based society and competitive economy is recognised as one of the most important priorities of sustainable development in Lithuania. These priorities associate with the agriculture and rural development strategy, which is particularly oriented toward increasing competitiveness of the sector, ensure safety and quality of production in coherence with sustainable development of rural areas and balanced management and protection of natural resources, quality of life in rural areas and encouraging diversification of economic activities.

In Lithuania the policy of research on agriculture and rural development is based on knowledge creation for competitive agriculture and food sector and rural development. Cooperation of scientific potential and financial resources for R&D activities gives significant input to this range. Main objectives of research are focused on creating of new technologies, modelling processes on different levels (from cell to individual unit; bio and social population), social and economic interaction and extension.

Ministry of Agriculture implements Agriculture, food and fisheries R&D 2007-2013 programme and Programme of social and economic research for agricultural and rural development policy implementation.

The aim of the Programme of agriculture, food and fisheries R&D 2007-2013 is oriented to promote a coherent system of agricultural, food and rural development R&D. The programme is implemented under four main areas:

- land, water and other natural resources for sustainable use, biodiversity conservation and landscape studies;
- energy and environment-friendly agriculture and food technology development, methods and processes search and adaptation, development of higher value-added agriculture and food products;
- renewable energy sources, technology development and rational use; and
- modelling of agricultural business and rural economic and social processes.

Programme output is focused on technological novelty, innovations and scientific recommendations for the main consumers - farmers, SME, rural services and community, some research results are used as recommendations for policy makers.

Main research topics which have strong position at the Programme relate to land consumption, climate change (adaptation), land use, product quality, food safety, bio-energy, animal genetics, physiology and health, plant pests and diseases, farming practices and management.

The objective of the Programme of social and economic research for agricultural and rural development policy implementation is oriented to analyses of micro and macroeconomic processes in agriculture and rural areas, preparation of forecasts and scientific recommendations on economic and social dimension. Scientific recommendation, analysis, forecasts, statistical data are used in all levels of agricultural, rural development and fisheries policy implementation.

Main research topics of the Programme are focused on agriculture management, economic instruments, farmers' incomes, primary production, diversification of activities in rural areas, social processes in rural areas, rural - urban relationship and demographic changes.

Depends on tasks research projects have national or regional scale. Regional scale often is realised through recommendation and scientific decisions at national or in some cases local level.

Ministry of Agriculture of Lithuania sees a need to encourage an interdisciplinary and trans-disciplinary research. These activities started at national level, but process isn't explicated sufficiently. Ministry of Agriculture together with the Ministry of Science and Education and Lithuanian Science Council prepared national research programme 'Safe and Healthy Food', in which interdisciplinary research will be encouraged.

Ministry of Agriculture of Lithuania sees a need to prepare common research agenda for long and short term research on regional and EU level, to encourage national research for international cooperation and coordination, to stimulate networking of research infrastructures in EU scale and to promote exchanging of resources, methodologies and good practices in research through RURAGRI project activities.

Poland

The national policy dimension of the research programmes

The national policy of research and development programmes covers a wide range of interests. At present, the main funding bodies for research are: National Centre for Research and Development, Ministry of Agriculture and Rural Development. The beneficiaries of the financial resources managed by the ministries are specialised research institutes overseen by the individual ministries, the institutes of the Polish Academy of Sciences, institutions of higher education and other units. Some of the resources are coming from national and international funds. The Ministry of Agriculture and Rural Development has a big impact on research activities in the area of rural development. What are the aims and strategies of the funding bodies and the national policies? Priority areas of research include long-term goals, implementation of a long-term state policy aimed at granting, research, economic and social characteristics and correlated sustainable development. It is established by the Minister of Science and Higher Education, after consulting the Committee of Science Policy and Scientific and Technological Research Council, in regard to the Polish learning needs of the economy and the amount of funding.

The priority research areas were placed in the following research topics:

- Society in a safe, accelerated and sustainable socio-economic development;
- Health;
- Energy and Infrastructure;
- Modern technologies for the economy;
- Environment and agriculture.

The above stated priorities are listed in the National Programme of Scientific Research and Development Work (published in 2008).

The national visions, strategies and planned actions

Research area includes assessment of status, risks and use/utilisation of natural resources and biodiversity in Poland, possibilities of their more efficient utilisation for national economy and society while maintaining the environment in a condition which helps to restore it in a natural way. In the non-renewable resources area the most important issue is to use non- or small-waste technologies of their take-off and processing. In the area of agriculture and environment there are expected findings about:

- Rational water management for sustainable country development;

- Innovative products with high nutritional and pro-health values;
- Relationship between different groups of organisms;
- Relationship between organisms and their environment;
- Food quality and its impact on human health.

The main points of interest: increase in the quality of Polish research and technological development, solving important societal and economic problems, establishment of good research infrastructure, development of novel products and novel technologies to increase innovation and competition in the area of agriculture, sustainable development and rural development

Poland foresees a need to encourage multi-/interdisciplinary and trans-disciplinary research through: providing appropriate financial and organisational measures at national and European levels. Topics considered to be of European importance: management of natural resources, food security and safety, human nutrition and consumer health and well-being, plant breeding and biotechnology, climate change, economic, social and political aspects of sustainable rural development, engineering and mechanisation in rural areas, plant production and protection, environment protection, animal production and husbandry, animal health and welfare, aquaculture and fisheries, forestry and landscaping, horizontal issues. The most interesting areas for joint research:

- Making a better use of the natural soil, water, and air resources for the protection of the natural environment;
- Modernisation of agriculture and diversification of enterprises in accordance with the priorities and agricultural policies of the European Union;
- Increasing the creativity and competitiveness of agricultural enterprises;
- Promoting cooperation between Polish and foreign enterprises in the field of agriculture, sustainable development and rural development;
- Implementation and exchange of knowledge, new technologies, and bio-products between Poland and other countries.

The research priorities of the RURAGRI partner

Agricultural research in Poland is mainly based on governmental programmes and funded by state budget through subsidies for statutory activities and competitive grant programmes. A review of the situation in Poland highlights several national and international RTD programmes and projects, which were adopted by the Ministry of Science and Higher Education, Ministry of Health, Ministry of Agriculture and Rural Development. The following topics are especially interesting for the funding bodies in Poland to be executed in a European context: development and improvement of societal conditions in rural areas, sustainable

development, organic agriculture, protection of the environment, mitigation of climate change, management of water resources, agricultural infrastructure, food quality and safety, nutrition and consumer's health.

The Ministry of Agriculture and Rural Development supports the multi-annual programmes related to the development of rural areas, especially topics concerning biological progress in food production and sustainable utilisation of some natural resources:

- Biological, environmental and technological determinants of the development of livestock production;
- Multi-annual programme 'Protection of animal health and public health';
- Multi-annual programme 'Improving plants for sustainable agro ecosystems, high quality food and crop production for non-food purposes';
- Multi-annual programme 'Development of sustainable methods of horticultural production to ensure high nutritional, and biological quality of horticultural products, and to maintain biodiversity, of horticultural environments and protection of their resources';
- Multi-annual programme, 'Management of the Polish agricultural environment and sustainable development of agricultural production';
- Multi-annual programme 'Protection of crop plants with emphasis on food safety and reduction in yield loss and risk to human health, domestic animals and the environment'.
- Multi-annual programme 'Economic and social determinants of the development of Polish food economy after Poland's accession to the European Union'.

Another source of support for research is the Ministry of Science and Higher Education. The Minister of Science and Higher Education is responsible for planning and providing funding to scientific institutions, universities and other entities as budgeting officer of Science and Higher Education and intermediary in the three operational programmes: Innovative Economy, Human Capital, and Infrastructure and Environment.

Funding of research activities is carried out in accordance with the Act of 8 October 2004 concerning the principles of financing science. The major areas of funding include:

- Strategic research and development activities managed by the National Centre for Research and Development and other tasks carried out by the Centre;
- Research projects, development projects and targeted projects funded by the Minister;

- Statutory activities of scientific institutions, including their own research and the maintenance of specialised test equipment;
- Investment for research and development work;
- Scientific cooperation with foreign countries;
- Research support activities (tasks for the development, promotion and practical application of science);
- Programmes or projects determined by the Minister (including the programmes 'PATENT PLUS - support for patenting inventions,' 'Creator of innovation' to support innovative academic enterprise', 'Support for international mobility of researchers'.

Scotland

The Scottish Government (Rural & Environment Research & Analysis Directorate) funds a wide range of agricultural, biological and environmental research. The main programme of research amounts to approximately £45 million each year and is managed on behalf of the Scottish Government by the Rural and Environment Research and Analysis Directorate (RERAD). The research funded is mainly strategic and applied work.

The largest part of the research effort takes place through 5-year Programmes of Research. The current programme runs from April 2006 to March 2011, and the new programme will run from April 2011 to March 2016 - we are therefore now in the period of transition from the current to the new programmes. RERAD-funded research is conducted primarily through its Main Research Providers (MRPs): Biomathematics and Statistics Scotland (BioSS); Macaulay Land Use Research Institute; Moredun Research Institute; Rowett Institute of Nutrition and Health (University of Aberdeen); Royal Botanic Garden Edinburgh; Scottish Agricultural College; and Scottish Crop Research Institute. The MRPs also compete for funding from other sources in the public and private sectors.

Research programmes 2006-2011

A Programme Approach to funding research was adopted, focusing on areas of policy priority and the needs of end users. The overall objectives for the strategic research programmes for 2006-2011 were set out as:

- To procure scientific research that is of high quality and strategically relevant to Scottish Ministers' policy, legislative and enforcement functions;
- To improve knowledge and technology transfer from, and public awareness of, the research and its outputs;
- To ensure that those parts of the research base funded by RERAD are effective and efficient.

The research consists of four main research Programmes, the first three of which are particularly relevant to the scope of RURAGRI:

- Programme 1: Profitable and Sustainable Agriculture - Plants;
- Programme 2: Profitable and Sustainable Agriculture - Animals;
- Programme 3: Environment - Land Use and Rural Stewardship;
- Programme 4: Impacts on Human Health.

The programmes of research have three overarching, cross-cutting themes (CCTs) which provide the strategic context for the overall research effort: these are Climate Change, Biodiversity, and Sustainability.

Research programmes 2011-2016

Advances in science and the Scottish Government's focus on a Single Purpose ('to create a more successful country with opportunities for all of Scotland to flourish, through increasing sustainable economic growth'), presented both an opportunity and a need to consider a change in emphasis for the content of the research to be commissioned in the strategic research for 2011-2016.

After initial discussions with an independent panel, extensive consultation took place with policy makers, academics, industry representatives and the Main Research Providers. The Programme Research for 2011-2016 will be structured into eight research Themes, brigaded into two programmes:

Environmental Change (Local Responses to Global Change)

- Theme 1: Ecosystem Services
- Theme 2: Strong and resilient sources and supply chains for water and energy (Water and Renewable Energy)
- Theme 3: Technologies and management tools to deliver greater benefits from rural land use and increased resilience to change (Land Use)
- Theme 4: A rural economy resilient to global and local change (Economic Adaptation)

Food, Land and People (Optimising the Potential of Scotland's natural assets)

- Theme 5: Efficient and resilient supply chains for food (Food)
- Theme 6: Animal/plant health and disease and animal welfare (Health and Welfare)
- Theme 7: Healthy safe diets (Diet and Health)
- Theme 8: Vibrant rural communities (Rural Communities)

Further details of the specification for RERAD's new strategic research programmes (2011-16) are available on the following web-pages:
<http://www.scotland.gov.uk/Topics/Research/About/EBAR/StrategicResearch/future-research-strategy>

Slovenia

Rural and sustainable development is of Slovenia's utmost importance. This is why a holistic as well as a multidisciplinary policy concerning research in the field of rural/sustainable development is being lead that comprehends several ministries and agencies. Research that is funded is therefore serving as guidance for future governmental decisions as well as the industry and rural communities them self.

Directorate for Science under the Ministry for Higher Education, Science and Technology defines the expert bases for the adoption of political documents in the field of research policy. It drafts laws and implementing regulations on research activities. It establishes and enhances the system of comprehensive analyses and monitoring of the situation and development in research, develops new tools for attaining research policy goals, and plans the required financial resources for research.

The Government of the Republic of Slovenia also established the Slovenian Research Agency. The Agency performs professional, development and executive tasks relating to the National Research and Development Programme at every level, as well as other work to promote research and development activities. The Agency carries out its legally determined duties in the public interest, providing permanent, professional and independent decision-making on the selection of programmes and projects financed from the state budget and other financial sources. The Agency is an indirect user of the state budget in terms of the legal provisions that govern public finances and public agencies.

Research on rural and sustainable development in Slovenia is mostly funded through various European frameworks and the Target research programme Slovenian Competitiveness 2006-2013.

Target research programmes represent a system created in 2001 for inter-sectoral cooperation in planning and implementing networked R&D projects for specific areas of public interest. They represent a special form of scientific and research programme with which the Ministry for Higher Education, Science and Technology intends to contribute to setting and implementing strategic development objectives for Slovenia in cooperation with other ministries and other interested users, in order to improve Slovenia's competitive capacity.

Research within a targeted research programme is problem-oriented and targeted towards improving Slovenia's competitive capacity, which should form the basis for successful development and an increase in the standard of living of its inhabitants. It takes into account the basic guidelines from the Slovenian Economic Development Strategy on the sustainable development of Slovenia and the interconnection and dependence of economic, social and environmental dimensions of development.

This means that a target research programme must be understood and used as one of a set of tools that directly implements the Slovenian Development Strategy and other development programmes in Slovenia.

The main research institutions in Slovenia are public institutes as well as universities which do not function under an umbrella and are internal but independent. In the recent years more and more effort is also being put in to incorporation of the industry in the research process thru several initiatives and frameworks such as ERA-NET, EUREKA/EUROSTARS, ARTEMIS and Centres of Excellence.

Such approach results in a more balanced ratio between fundamental and applied research as well as it stimulates multidisciplinary endeavour.

Spain

The Spanish knowledge infrastructure on agriculture, rural development and food research is financed by Spanish Ministry of the Environment and Rural and Marine Affairs (MARM) and the Ministry of Science and Innovation (MCI) and carried out by three main public institutions: the universities, the *Higher Council for Scientific Research* (CSIC) and the National Institute for Agricultural and Food Research and Technology (INIA). The first two institutions focus mainly on fun-

damental research, whereas INIA orientates most of its activity toward applied research via the Agricultural Resources and Technologies sub-programme (RTA), as part of the National Research Program, elaborated by the MIC. There are annual national calls where institutes or researchers, through the institute they belong to submit a research project proposal for one research sub-programme. These proposals are evaluated by the National Assessment and Planning Agency (ANEP) to rank their scientific quality.

Public Research Institutions

In Spain, the knowledge infrastructure on agriculture and rural development is developed by the Spanish Ministry of the Environment and Rural and Marine Affairs and the Ministry of Science and Innovation. The former coordinates the National Programme of Rural Development 2007-2013 with the regional governments of Spain. The latter coordinates the National Scientific Research, Development and Technological Innovation Plan 2008-2011, which includes the agricultural and food research of the country and it.

INIA is public research institute based on public funds. Within the National Scientific Research, Development and Technological Innovation Plan 2008-2011 INIA coordinate various sub-programmes related to agricultural and food research, being the two most important, in terms of funds: (a) the Fundamental Research Projects Subprogram, orientated to Agricultural Resources and Technologies (RTA); (b) the Technological and Scientific Infrastructures. It has a two-fold role: as research institute and as a coordinator of the research projects (as INRA) implemented by regional agricultural research institutes. These institutes (IFAPA, IRTA, IVIA, IMIA, et cetera) are public too.

Annually, the Ministry of Science and Innovation determines the budget allocated to the sub-programmes coordinated by INIA, being the RTA sub-programme the most important. In relation with the RTA Sub-program, which focuses on agriculture and food, the research priorities are indicated in the national call. The research priorities include: (a) the improvement of the agricultural and agro-industrial production; (b) the provision of safe, healthy and quality food; (c) the promotion of sustainable agricultural production and the territorial cohesion.

Evaluation of Research Proposals for each Sub-program

The research project proposals are evaluated in a two-stage procedure:

1. *The National Assessment and Planning Agency (ANEP)*

The scientific evaluations submitted by the Agency are performed by anonymous experts, fundamentally based on the peer review system. These

evaluations are intended to be used by management bodies to help them make funding and other financial support decisions. Since its creation the ANEP has provided one of the two components necessary for the selection of activities for funding, namely scientific/technical evaluation.

2. *Institution Committee*

The other component, a report on the appropriateness of the funding and the project's match with science policy objectives, is the competence of the funding bodies themselves.

The fact that the evaluation is carried out by an independent institution separate from the funding institution, which is responsible for the final decision as to whether to fund the action or not, adds an additional mechanism guaranteeing the quality of the evaluation. Hence, the ANEP's role does not include funding of activities or the design of science policy.

Once the proposal is approved, a, generally, three years research project is monitored annually and a final report is issued about the main findings. On a random basis, a number of projects are selected to be presented to a group of experts to explain the current progress of the project and adequacy of the activities implemented.

The dissemination methods are included in the proposals. There are also specific units, in INIA and the regional research institutes, to disseminate the main results of the projects through their websites and the organisation of events.

Research sub-programmes

RTA is the most important National Sub-programme orientated to agriculture and food technology in Spain and is coordinated by INIA. The objective of the programme is to support applied research actions addressed to improve agricultural production efficiency and sustainability, agriculture in relation with consumption and rural development as well as agri-food industry and taking into account the regional interests and coordination.

INIA is in charge of launching the call (every year). The Evaluation in two-step procedure: first step by National Agency for Evaluation and Foresight (ANEP) and second step by institution Evaluation Commission). The final funding decision corresponds to the Coordination Commission, which includes INIA and the Regional Agricultural Research Centres. Annual and final monitoring and financial control are carried out by INIA (SGPCP: Foresight and Programme Coordination Unit).

Sweden

The mission of the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas) is to promote eminent research for sustainable development. For instance, it supports young researchers by funding postgraduate students in projects or within the framework of research schools. Formas also finances assistant professors, postdoctoral fellowships, and fixed-term 'special researcher' appointments. Further, the Council is responsible for ensuring ready to access information on research and research findings. It works to create platforms for dialogue between research and practice, and it supports the obligations of higher education institutions to collaborate with society. Formas promotes international contacts. One of its major tasks is to safeguard Swedish interest as regards national presence in EU research programmes.

Only research of the highest scientific quality and social relevance is funded. The results of the research are published in international scientific journals with peer review. Formas annual budget for financing research is almost 100 MEURO, almost half of this is directed to the agricultural sector. In order to find the best project proposals, incoming applications are reviewed by prominent Swedish and international researchers (peers) as well as potential users (from companies, public authorities and organisations) Formas evaluates the effects of the research support. The evaluations are performed by international experts, particularly with regard to scientific quality. Publication and citation analysis are used to an increasing extent. Formas also works to ensure that the results of the evaluations are made known and put to use

The main part of the research funded by Formas is induced by a bottom-up process. Researchers submit ideas and proposals for research and expert panels at Formas choose the proposals with the highest scientific competence and societal relevance to be funded. Also, the main part of the research performed in Sweden is performed at universities and higher education institutions (HEIs). For RURAGRI there are a few relevant institutes; JTI - Swedish Institute of Agricultural and Environmental Engineering and The Forestry Research Institute of Sweden. However, one of the universities of Sweden; The Swedish University of Agricultural Sciences (SLU) is a 'profile university' with its strengths in the areas of Animal and human health, Genetic resources and biotechnology, Sustainable production and natural resources, Climate and ecosystem change, Quality in the food chain and Community planning. Researchers at SLU receive the major part of Formas yearly funding budget. Roughly 90% of the research in this area is

undertaken by Swedish universities. The institute sector is rather weak in Sweden. For RURAGRI there are a few relevant institutes; JTI - Swedish Institute of Agricultural and Environmental Engineering and The Forestry Research Institute of Sweden.

As previously noted, the main part (roughly 90%) of the research in this area, is undertaken by Swedish universities. The institutes involved in agricultural research are semi-public and they are external and independent of the funding bodies. There is a limited interaction between Formas and the research institutes, the institutes receives a small (10%) public basic funding from the state and industry. The main part of the funding is per project

At the moment, there are three on-going research programmes at Formas within the RURAGRI area. They are named '*Organic production*', '*Rural development*' and '*Formas yearly open call for proposals*' (where proposals within all Formas areas of responsibility are included):

- http://www.formas.se/formas_templates/Page___5996.aspx
- http://www.formas.se/formas_templates/Page___4640.aspx
- http://www.formas.se/formas_templates/Page___5846.aspx

Researchers apply for grants in an open call within the area of interest (dependent on the topic of the programme). The applications are submitted online. The proposals are individually evaluated by at least 8 prominent researchers and users in society before they are discussed and ranked at a panel meeting.

In Formas view, the main opportunities with joint research programmes are to make it possible for excellent researchers in different countries to work together, hopefully making a quicker progress on difficult research issues. The threats might be the regulations and rules with common pots and that 'small but important' research areas are not funded. The added-value of implementing a national programme in a European context is that several countries battle with the same problems/research questions and that research groups in different countries are specialists at different areas. By using the strengths of different parties, and cooperating with different users in society of several countries, much more can be achieved.

Joint research programmes increase cooperation and internationalisation of the research, which is of great value. Since the main load of research is performed at universities in Sweden, it is also important to interact with users in society of different countries.

Formas encourages both multi/interdisciplinary and trans-disciplinary research. For instance has Formas had calls for 'Strong Research Environments' where only trans-disciplinary projects could be funded.

Formas does not expect budget cuts in the near future, giving a positive view of the future.

Formas see that topics within the European Commission, Council, European Parliament, civil society e.g. biodiversity, trade, CAP reform, food security and climate change are very important. Also, demographic studies will be an important area of research in Sweden in the future. Emerging research topics that currently not are covered in any research programme but that Formas would like to see is for instance: rural development, social environmental research and urban development. Formas would suggest some of these five very interesting topics for joint research: the ecological dimension of land consumption or natural resource management, the economic dimension of land use (agriculture, forestry, tourism, et cetera) and renewable bio-fuel and bioenergy. Also, the social dimension of demographic changes is very important.

Switzerland

The thematic focus of RURAGRI is of high importance in Switzerland. Many activities within the frame of federal strategic decisions, political programmes and action plans have been tackled. These are - among others - the Strategy Sustainable Development, Biomass Strategy Switzerland, Sustainable Development of Rural Areas Switzerland, Programme Natural Resources and Programme Projects for Regional Development. These initiatives are administrated by different Federal Offices which belong to different Federal Departments. This reflects the broad interest in these themes and the challenges when it comes to find appropriate measures.

The Swiss partner of RURAGRI the Federal Office for Agriculture (FOAG) is one of the key players in the cross-sectional area of sustainable development, rural areas and agriculture. The FOAG is responsible to ensure - under the Federal Law on Agriculture - that through sustainable, market-oriented production, agriculture makes an essential contribution to secure provision of food for the population, maintenance of the natural basic elements of life, conservation of the cultivated landscape and decentralised settlement of the land.

One of the very important topics for Switzerland is the loss of soil, in respect to both quality and quantity. In the field of quality, Switzerland might already have a broad knowledge but the exchange with other countries should be increased since climate change will confront several countries with new challenges where maybe others are already experienced with. Concerning loss of

surface in the most productive areas, Switzerland has implemented several measures. An international exchange in this issue is welcomed.

Concerning the direct payments, Switzerland could offer brought knowledge to other countries and to the reform process of the European policy in agriculture. Other issues such as food security, biodiversity, landscape conservation, sustainable use of natural resources, et cetera could be discussed under that framework and explain the importance of public support for the future agriculture. Furthermore, Switzerland could offer knowledge in issues connected with the multifunctionality of agriculture, the loss of farmland to urban and forest uses, the competitiveness of rural businesses and rural infrastructure.

Especially interesting for the FOAG to be executed in an European context are public goods provided by agriculture, multifunctionality of agriculture, the future of mountain agriculture, food security, sustainable rural economy, sustainable use of natural resources, challenges for agriculture under climate change and adaptation. Emerging research topics which are currently not covered in the research programmes are the economics of food safety, active landscape management, the (social dimension of) sustainable development in rural areas. Hence, interesting issues for joint research are natural resources management, food security (land consumption), diversification, spatial conflicts and the competitiveness and potential of rural economies.

The Swiss National Science Foundation (SNSF) is the most important Swiss agency promoting scientific research. It supports, as mandated by the Swiss Federal Government, all disciplines. SNSF supports targeted research in the form of two large research programmes: the National Research Programmes (NRP) and the National Centres of Competence in Research (NCCR). Both programmes provide funding for co-ordinated research with clearly defined goals for a limited time. The major objectives are collaboration with non-academic partners, knowledge and know-how transfer in education and practical work as well as the application of research results. Funded research topics are in general not considered for funding in the following years. Due to their size NRPs are rather suitable for the upcoming Joint Programming Initiatives than for ERA-NETs. 'Landscapes and Habitats of the Alps', 'Sustainable Development of the Built Environment' and 'Sustainable Water Management' are three of the latest NRPs within the context of RURAGRI.

For RURAGRI interesting national research programmes are bottom-up initiated programmes and programmes from research institutions. These programmes are more flexible and better suited for joint activities with RURAGRI. AgriMontana is an 'umbrella' programme of the research station Agroscope which belong to the FOAG. The programme coordinates different projects inside

and outside of Agroscope. The aim of the programme is to devise and implement development strategies for agriculture and for the sectors upstream and downstream of it in the mountain area. AgriMontana's overriding aim consists in the compilation of bases for action (best practices) and policy measures (best policies), as well as decision-making aids based on these for regional players and the policy for ensuring the sustainable use and shaping of mountain areas. In terms of policy consulting, the programme thereby makes a contribution towards a coordinated regional and sectoral policy.

A strong bottom-up programme is AlpFUTUR - The future of summer mountain grazing in Switzerland. It consists of 17 coordinated research projects and has been initiated by scientists from Agroscope and the Federal Research Station for Forest, Landscape and Snow WSL. Another programme owned by Agroscope, WSL and AGRIDEA was the now closed programme PASTO. It aimed at testing and developing a new set of farming practices based on Hérens suckler cows with two main objectives: optimising beef production and up keeping mountain landscapes. Main issues of concern in the research programmes AgriMontana, AlpFUTUR and PASTO are biodiversity, landscape, natural resource management, land use, regional entrepreneurship, farming practices, incomes, rural areas societal demands and expectations.

The main responsible institutions of agricultural research and education in Switzerland are the ETH (Swiss Federal Institute of Technology), Agroscope (the entity of Swiss Federal Research Stations), FiBL (Research Institute of Organic Agriculture, Foundation) and the Swiss College of Agriculture. Furthermore, some departments of universities and universities of applied sciences are involved in agriculture related research. The universities and the ETH cover basic research areas. Agroscope and FiBL are strong in applied research and extension work. The research of the Swiss College of Agriculture is close to the needs of farmers and SMEs and is also important in the context of research education.

Agroscope develops scientific knowledge and basic technical principles for agricultural and environmental policy decisions and their legal implementation and provides the basic information for policy consultation. The research stations link applied science, policy implementation (propositions of agricultural measures) and policy evaluation (controlling) in order to have a complete vision of Swiss agriculture and to be able to advise the FOAG.

The Netherlands

Research concerning agriculture, sustainable development and rural development in the Netherlands is mainly financed by the Ministry of Agriculture, Nature and Food quality (ANF) (Ministry of Economic Affairs, Agriculture & Innovation, from October 2010). The research is carried out particularly by Wageningen University and Research centre (Wageningen UR) which is formed by the Wageningen University and specialised research institutes. Besides under the authority of the Ministry of ANF, Wageningen UR also carries out research for other principals. The main policy themes for 2010 for the Ministry of ANF are: Sustainable enterprise; Knowledge and Innovation; Nature, Landscape and the Rural Area; Food, Animal Health and Consumer Policy.¹ In the area of agriculture, sustainable development and rural development important themes are: Sustainable production (e.g. improved energy efficiency in glasshouse production, increased land under organic agriculture, decreased phosphate, nitrogen, and pesticide use); Encouragement of the agricultural sector (for 2009 and 2010, the Government has made €50 million available to allow the sector to invest in measures that encourage the economy and create jobs); Biodiversity (as a signatory to the Biodiversity Convention, the Netherlands aims to achieve a major reduction in biodiversity loss by 2010); Natura 2000 (the Netherlands has 162 nature reserves which by December 2010 must have all been officially designated as Natura 2000 sites. For many of them a management plan must then be in place, setting out the targets and the way in which they will be realised with the right balance between ecological and economic interests); A living countryside (in its rural development policy the Government aims to address all socio-economic sectors in the rural area to create a living countryside. In 2010 extra funds has been earmarked for the Rural Investment Budget to strengthen facilities and small-scale enterprise); Sustainable food (the government together with trade and industry and civil society will seek ways to create a system with which food can be produced with respect for people, animals and the environment).

The vision of the Ministry concerning the future of the Dutch agricultural sector is improvement of the competitiveness of the European agri- and horticulture, in combination with improving the sustainability of agricultural production, and

¹ Based on the policy agenda for 2010 of the Ministry of Agriculture, Nature Management and Food Quality as it was announced on Budget Day, Tuesday 15 September 2009.

dovetailing production with public values.¹ Furthermore the Dutch government stated that corporate social responsibility is important because economic growth needs to take place in consideration of the impact on the environment and social circumstances. Therefore, the Dutch government stated that every enterprise should integrate social responsibility (or sustainability) in his core activities.²

The aim of the Ministry of ANF as funding body for the research programmes is to develop scientific knowledge to support short and medium term policy-making concerning agriculture, sustainable development and rural development.

The planned research programmes in the area of agriculture, sustainable development and rural development are:

1. The Arrangement and Use of Green-blue areas. The objective of this research programme is the development of new scientific insights, concepts and methods for the physical adaptation of regions and the related decision making mechanisms, and targeted towards the sustainable use of the green and blue areas.
2. Climate change. The objective of this research programme is firstly to explore the expected developments of climate change, and its effects, and of increasing climate variability in the green-blue areas. And secondly to develop scientific knowledge that can serve as input for formulating mitigation and adaptation measures with relation to the climate policy.
3. Sustainable Agriculture. The objective of the programme is to obtain knowledge on the interactions that are the basis for the sustainable performance of agro-production systems and the functionalities of these systems.
4. Nature, landscape and rural area. This research programme focuses on social functions of spatial usage with the physical state of ground, water and climate. Furthermore, there is a focus on ecological biodiversity, spatial ecological coherence and species protection on both green and blue ecosystems.

The international context of the research programme Arrangement and Use of Green-blue Areas is particularly set by the policy concerning sustainable development as stated in the Treaty of Lisbon (2007) and the Millennium Assessment (2001-2005). Also the Agenda Landscape (2008) and the CAP Reform

¹ Based on a vision paper by the Ministry of ANF called Houtskoolschets, published in 2008.

² Government Vision on Corporate Social Responsibility 2008-2011 (presented in 2007).

both with a focus on the growth in multi-functionality in the rural area, has influenced the research agenda of the programme. Furthermore the Policy programme Biodiversity (2008) is relevant as its main objective is to reduce the damage to biodiversity and stimulate sustainable use of biodiversity and ecosystem services, to protect the vulnerable and valuable biodiversity and to improve management of marine ecosystems.

Relevant for the research programme Climate change is the decision in 2005 of the Dutch Cabinet to commit oneself to the so called '2 degrees target' as proposed by the EU. That demands for an emission reduction policy of -30% CO₂ equivalents in 2020 and -60 till -80% in 2050. Also the objective of the Dutch as well as the European policy is to generate 20% of the energy by means of sustainable energy in 2020. Therefore the Dutch cabinet financially promotes the development of a so called bio-based economy. Furthermore the National Programme for Spatial Adaptation to Climate Change (ARK) started in 2007. That programme is based on the shared belief that spatial adaptation to the effects of climate change is essential and a top administrative priority. Knowledge for Climate is the scientific research programme that supports ARK and is aimed at knowledge development for a local, regional, national and international climate adaptation strategy.

The national context for Sustainable agriculture is formed by the Policy document Sustainable Food (2009). The objective of the Sustainable Food policy is to stimulate sustainable innovations in the Dutch agribusiness, to seduce Dutch consumers to sustainable (and healthy) food consumption and to create space for a sustainable Dutch agro food chain. Also relevant for sustainable agriculture is the Social Innovation Agenda Sustainable Agro and Fisheries chains (2009). The purpose of that Social Innovation Agenda is to develop solutions for societal problems related to present agro and fisheries chain by means of new ways of thoughts and insights securing the future demand for food and commodities.

The policy document Agenda for a Vital Countryside (2004) and the National Spatial Plan (2005) are two leading policy documents concerning the rural area in the Netherlands. The main objective is to adjust social functions (spatial usage) to the physical condition of the soil, water, and climate on a sustainable way.

According to the Coalition Agreement 2007-2011 the goal of the Dutch cabinet is to mutual adapt different spatial claims and to realise them in regional processes. Therefore farmers, citizens and country people are being more involved and giving more responsibility (ANF Policy agenda 2008).

The research topics that have a strong position in the concerned research programmes are biodiversity, climate change, ecosystem services, land use and biomass. Concerning future co-operation, the main opportunities for joint research programmes identified are:

- The development of joint methodology which each participating country can apply;
- Future perspective and integrated models and scenarios, monitoring;
- Global and European issues (e.g. food crises and competing claims);
- Making better comparison between countries (lessons to be learned from other countries) given a comparable European context;
- Knowledge exchange between research organisations;
- Formulate recommendations for better cohesion in (cross border) spatial policy;
- Transdisciplinary research.

Main points of interest of a joint research programme from the point of view of the funding body are: (i) the reform of the CAP of which the health check is the most recent development, but also the scheduled CAP reform in 2013 and 2020, and (ii) the fact that the topics concerned (environment, nature, water, et cetera) is crossing state borders.

Turkey

The General Directorate of Agricultural Research (GDAR) represents Ministry of Agriculture and Rural Affairs which is the main funding body of agricultural researches in Turkey.

The main objective of this survey report is to provide general information about agricultural research system, research programmes and funding mechanism of MARA/GDAR, for making contribution to realisation of the RURAGRI project objectives. This report has been built on available information sources of Turkey, particularly MARA/GDAR.

Decree-Law No. 441 establishes functions of the MARA. These functions are: to improve agriculture, animal husbandry and fishery products; to accomplish research, plans, programmes and projects for production, input needs and development of natural resources such as land, water, plant, et cetera. MARA coordinates and implements the agricultural R&D activities through GDAR with its 58 research institutes. GDAR has an 84-year experience in funding and coor-

minating research programmes in the field of agriculture, food, natural resources and rural development.

Research plays an important role in Turkey's general policy agenda. It has been an integral part of the development plans for around five decades. Turkey's five year development plans have included environmental strategies and sustainable developments. One of the five development axes in the Ninth Development Plan, covers the period of 2007-2013, is regional development. For sustainable agricultural land and water use, new laws and institutional regulations have been put into force, which combine environmental concerns and agricultural policies. Agriculture Law was enacted in 2006 in which one of the article under the title of 'biodiversity, genetic resources and biosafety states that the Ministry does research or to have it done in the field of conservation and development of biodiversity, genetic resources and ecosystems. In the other article of the Agriculture Law under the title of 'rural development', it is stated that the Ministry takes measurements to increase employment, to raise level of the entrepreneurship and education of the women and young people and to increase and diversification of income for agricultural and non-agricultural sectors in the rural areas.

The mission of GDAR in the context of Turkey's agricultural research policy is to provide benefit to the country in respect of socially, economically and environmentally by concluding agricultural, food, and rural development researches with high quality and in response of the country's needs.

During perform its duties; GDAR follows basic strategies as outlined below:

- delivers its sources on Areas of Research Opportunity which has high-priority that provide maximum benefits to Turkey in respect of socially, economically and environmentally and also GDAR focuses on developing research programmes in these areas;
- takes into account the demands of market and target groups in the research programmes and for the research projects, gives priority to planning and running in cooperation with end users;
- sets up appropriate balance between long-term strategic researches that expect to meet future needs and short-term applied researches which are for solving the current problems in agricultural sector;
- shows efforts to develop its R&D capacity and builds a research system that meets with expectation of the country and has an international competitiveness;

- encourages research institutions and researchers of other countries for participation to research activities that assist Turkey to accomplish its agricultural research targets;
- provides opportunity for the collaboration of public and non-public institutions and gives priority to problem oriented, multi-partnered, multi-disciplinary projects rather than individual projects;
- develops a research database for the aim of ensuring continuity of research activities, preventing duplications, and providing new projects relevance to the objectives of the research programmes;
- regularly monitors and evaluates the research projects;
- transfers the research results to users directly or in cooperation with extension services.

It is clear that Turkey in general and in particular MARA and GDAR give importance and priority to sustainable agriculture and rural development. Some examples of the GDAR research programmes related to sustainable agriculture and rural developments are given below:

- Organic agricultural Research Programmes, which are integral part of Turkey's rural development policy, have a specific legislation fully adapted to the EU legislation;
- Conservation and development of soil and water resources;
- Genetic resources conservation programme (only livestock genetic resource programme issued in this report);
- Traditional food (very important for rural development and conservation of cultural heritage).

Although the main areas of research that GDAR has strong position are plant breeding and protection, livestock breeding and husbandry, animal health, aquaculture, food and feed, natural and genetic resources, research priorities are climate change (mitigation and adaptation), natural resources management, biodiversity, food safety and cultural heritage.

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