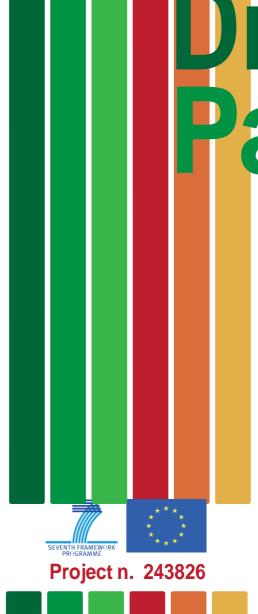**LIAISE**

**Linking
Impact
Assessment
Instruments to
Sustainability
Expertise**

Discussion Paper

Synthesis of research needs for IA tools in research programmes inside and beyond the IA research community

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Preamble

The present document is the first of three versions of Deliverable 2.3 'Synthesis of research needs for IA tools in research programmes inside and beyond the IA research community'.

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D 2.3 - Synthesis of research needs for IA tools in research programmes inside and beyond the IA research community

1. Introduction

It is an essential element of LIAISE to identify knowledge and research gaps related to IA and to transfer them into explicit research questions. Results from deliverable D2.3 convey the knowledge gaps and obstacles for tool operation to support the policy-relevance of tools developed by the research community in the area of sustainable development. It is also the task of WP2 to ensure that the gathered research gaps are addressed outside the IA community, e.g. that they are discussed in workshops at conferences from affiliated societies or at expert workshops organized by WP2 specifically to discuss research gaps, research questions, roadmaps and the agenda.

The research gaps collected in this first version of deliverable D2.3 are gathered in four different ways (following the structure laid out in the methodological deliverable D2.1(Podhora and Helming, 2010)): (1) information provided by other WPs based on their research orientation within the project or even already based on their LIAISE research results, (2) through the WP2 mapping of research projects in the EU's research framework programme 6 and 7, (3) based on information by the narrow and wider IA research community, and finally by (4) extracting information needs from the user community.

The structure of presentation follows this methodological framework at least for this first version of the deliverable. As we will see, this often leads to a multitude of different types of research gaps identified in each section. Some WP2 members commented already considering this structure as not optimal and rather suggested a different approach where the presentation follows general categories of identified research gaps. Due to the late circulation of the first draft, this reorganisation could neither be fully discussed nor implemented before the final deliverable due date. However it will be considered for the next versions. In order to improve the overview we tried to complement the methodological structure by trying to apply – when possible - the following categorisation of research gaps within each of the sections:

- Type of research need (e.g. science policy interface, tool development, IA process)
- Policy area (e.g. agriculture, climate change, regional development, energy)
- Consequences (e.g. further research needed, dissemination of knowledge)

2. Research gaps collected from other WPs

In early 2011 we sent an e-mail to contact persons in the different LIAISE work packages and asked them to provide the three most important research questions regarding impact assessment as relevant to LIAISE from their work package point of view. We received response from 4 work packages (WP1, WP4, WP5, and WP6). Interactions with WP3 are initiated and will be pursued in the coming weeks.

The responses varied largely with respect to format and extent. They ranged from providing three distinct research needs to referencing other deliverables and draft papers with strong but very broad relevance for the task at hand. It also became evident from the responses that the level and state of discussion within the work packages differs strongly. Whereas some responses seemed to be more individual views on research priorities mainly drawing on the own research background, other identifications of research needs are already grounded in extensive discussion and literature review related to the tasks of the respective work package.

Below we provide a condensed Table 1 with a short description of the identified research need, the origin (WP), the type of the research need, the policy field identified and potential consequences arising from it. The full version of the responses to your inquiry of the work package contacts is available upon request from the authors of this deliverable.

Table 1: Overview on research questions/gaps from LIAISE work packages

Short Description	Origin	Category	Policy Field	Consequences
Better understanding of the relationship between tools and policy making in IA. Can we give general guidance on matching assessment tools and particular policy fields and stages of the policy process? Can we identify the conditions under which specific IA tools' are more/less likely to be used	WP1	Science policy interface	General	Further research needed. Two papers looking at cases with complex tool use are analysed
Understanding the use of 'wider evidence' in different venues of policy making (goes beyond IA tools but includes them)	WP1	Science policy interface	General	Further research needed. Will be taken up in deliverable D1.4. Sources and methodology not specified (yet)
Development of a toolkit with improved qualitative and quantitative techniques.	WP1	Tool development	General	Further research needed. Core activity of WP3
Model development for sustainable consumption and production (for theme 2 of the Sustainable Development Strategy)	WP4 Based on review of model inventories	Tool development and database compilation	Environmental Policy; Energy and Climate Change	Further research needed Specifically creating formal economic modelling tools targeted to policy impact assessment going beyond current technical assessments, but establishing concrete link of raw materials to economics sectors
Clearer definition of IA tools; When will a model be suitable for IA; What is the distinction between 'simple' and 'advanced' tools; What type of tools shall LIASE aim to offer.	WP5	Clarification of semantics; Identification of project objectives	Within project policy	Discussion and within project dissemination
Jurisdiction of LIAISE impact;	WP5	Identification	Within project policy	Discussion within project and

Development of indicators to assess impact of project/tool development		of project objectives		further research needed if affirmed.
Optimal connection between responsibility for data sets and tool development. Concern that relationship is too close and data fit tools instead of policy need.	WP5	Organisation of tool development and maintenance	General	Discussion needed between tool developers, database providers and policy experts; Further research needed to possibly identify rules.
Why has the institutionalization of policy appraisal not led to [more] institutionalisation of appraisal tools. Why is there still a considerable disconnect between appraisal guidance and training and the chaotic reality of policy making?	WP6	Science Policy Interface	General	Further research needed
How do 'non-rational' variables such as power of actors influence the roles and functions accorded to policy appraisal?	WP6	IA-actor interaction; IA-process quality	General	Further research needed
How, if at all, does policy appraisal lead to dialogue and learning in practice; how can the design of policy appraisal can be modified to nurture wider learning; what kinds of learning might be expected to appear in the practices of policy appraisal and by what means they should be detected and explored; what factors facilitate and/or constrain learning (however defined) outcomes?	WP6	Science Policy Interface	General	Further research needed
Is political control the most	WP6	General IA-	General	Further research needed

important (intended or unintended) consequence of policy appraisal or do other functions prevail; what are the causal mechanisms through which different policy appraisal systems bring control; does policy appraisal have economic, administrative or political (i.e. 'non policy') impacts in the short, medium or long-term?		process impacts;		

The research questions by WP6 reflected in table 1 are drawn from the conclusions of a still unpublished working paper (Adelle, Jordan and Turnpenny, 2011) written by members of WP6 with a review distinguishing 4 types of literature: Type 1 – designs of appraisal systems; Type 2 – functioning of appraisal systems; Type 3 – Evidence of appraisal systems leading to learning in the process; Type 4 – motivation of policy makers to use appraisal systems. A related, but less detailed published paper by Turnpenny et al. (2009) added to the understanding of the issues.

However, not all parts of the responses or referenced papers/deliverables given by the work packages could be organised in this fashion without violating the content and results of the work too much. Members of WP6 have elicited country specific research questions. The identified priorities of research gaps from the survey of country experts comprise *methodological needs* (e.g. providing guidance on IA process, linking ex-post with ex-ante evaluations), address *interactions between institutions* (e.g. developing tools able to integrate different opinions, increase collaboration between actors) and are related to the development of *tools and toolkits* (e.g. how can social and environmental impacts be better quantified; making tools more transparent and participatory). The more detailed research questions have been organised in their response to us by relating them to content categories and are repeated in a slightly modified fashion in the following:

CONTEXT
What is the role of context in framing the Science Policy Interface (SPI) for IA?
How does context affect tool selection and application – and more general - How may the appropriateness of tools for a specific IA be assessed?
What is the relation between IA and the political/institutional/cultural context in which it takes place?

POLICY CYCLE
Can the influence of IA in policy making be measured/established and if yes, how?
How can IA improve the overall policy (evaluation) cycle? (e.g. by linking ex post and ex ante evaluations).
What role(s) can IA evaluations have in the overall policy cycle?

PARTICIPATION
How can IA support collaborative decision-making?
What are the opportunities and obstacles for participation in IAs?
Which forms of stakeholder engagement can be supported in IA and how?
What are the characteristics of participative IA process?
Can we define a standard process of "collaborative decision-making"?
Sub-Questions:
How are stakeholders identified in IA process?
At what stages of IA process can stakeholders be engaged?
What functions can stakeholders provide in IAs?

SUSTAINABILITY
How can IAs integrate/balance the three pillars of sustainability?
How can social and environmental impacts be better qualified/quantified?

What are the criteria to balance the importance of different dimensions of sustainability?

SCALE
What are the different scales used?
What is the importance of scale in IA? (Impact regarding the different scales used)
What are the requirements of different spatial level for IA tool use?
Can the existing large EU-level IA tools/models be applied on MS level?

EVIDENCE
What is the role of evidence and how is it defined?
What are the main barriers of evidence based policy making (Data availability, lack of qualified personnel, etc...)?
Who decides what evidence is used?

TOOLS
How can we define costs and benefits of IA tool use?
What are the political, cultural, institutional factors which affect the appropriateness of certain tools?
How to make tools more transparent and participatory?
How to define simplicity and complexity of tools?
What are the factors which influence tool selection and use?

Overall we can see that the research questions identified by the work package contacts have a strong emphasis on understanding the IA process itself and the analysis/improvement of the science policy interface. This focus is clearly due to the intensity of the research work on these issues already done in WP6. Other work packages have not (yet) concentrated as much on specific research questions. We expect that especially the upcoming interaction with WP3 will come up with specific research gaps associated with existing tools and focused policy fields.

3. Research gaps from mapping

The mapping of projects from the EU's research framework programs 6 and 7 is a central activity WP2 in the first phase of the LIAISE project. It was originally envisaged that all further tasks and deliverables build upon the mapping results and its analysis. Thus D2.1 (Podhora and Helming, 2010) developed a template as a common basis to illustrate various criteria of the projects and to relate it to the work of LIAISE. The structure of the template for the mapping of research projects that are related to Impact Assessment (IA) is a) general project information, b) LIAISE relevancy, c) project data, d) project partners/point of contact, e) administrative information, f) recommendation comments, g) access data. The mapping is the central contribution to consolidate and to extend the IA knowledge pool by identifying how a project could contribute to improving the IA analysis. In the mapping the projects are selected for two categories:
  a) projects that directly refer to ex-ante policy IA,
  b) projects that refer to the policy process, e.g. their tools could support the development of policies, could conduct ex-post policy IA, could aim to mainstream specific topics into the policy making process, and could provide expertise from domestic as well as international policy IA in non-European countries.
A more detailed structure of the mapping can be found in D2.1 and D2.2. Here we summarize the main results regarding research gaps.
As described in D2.1, WP2 (ZEW) will provide a mapping of good practice examples from EI IA reports including the recent ones from 2009 and 2010. The good practice review is part of the toolbox development in WP 4. Since the work of this part of the toolbox was several times postponed, results of this mapping will be included in the next version of this deliverable end of 2012.

General mapping results

Through mapping of the 25 sectors of the EU's FP6 and FP7, LIAISE-relevant research needs for 9 out of 25 sectors were identified. The result summary in Table 2 shows the research gaps regarding the impact areas, the tools and the policies which need to be considered in more depth for the different sectors. The table shows that for relevant sectors, the projects focus on the governance level 'EU' and thereby miss out other levels such as the member states or non-EU countries.

Table 2: Identified research gaps from FP6/FP7 project mapping for the single sectors

Sector	Impact areas	Tools	Policies	Governance level
Policy support FP6	Social Impact areas	Participatory tools & linkage between the tools	others than agriculture	Member States and non-EU countries
Sustainable Development	Economic Impact areas	Assesment framework	--	Non-EU countries
Environment	Social Impact areas	--	other than EU focus	Member States and non-EU countries
Research and Innovation	Environment Impact areas	other than accounting tools	--	Member States and non-EU countries
Transport	Social Impact areas	usage of more diverse tools	--	Member States and non-EU countries
Energy	Social and Economic Impact areas	other than modeling tools	Specific policy areas not general ones	Member States and non-EU countries
Citizen and governance	--	linkage between the tools	--	Non-EU countries
Social science and humanities	All Impact areas	other than scenario tools	social policies	Member States and non-EU countries
KBBE	Social Impact areas	other than modeling tools	--	Member States and non-EU countries

Regarding the general mapping results, D.2.2 (Podhora and Helming, 2011) identifies the following central research needs to be addressed:

- Development of a design of policy relevant tools enabling policy-makers as users to quickly identify and apply tools that are relevant for their IAs,
- Reasons for the low share of projects that support the policy process in general (less than 3%),
- Opportunities for increasing the influence on the policy process of existing and forthcoming research projects funded in FP6 and FP7 (especially IA projects).

For other sectors not mentioned in Table 2, no projects related to Impact Assessment (IA) nor any Science Policy Interface (SPI) project could be identified. As the lack of LIAISE-relevant projects might imply important information for the identification and prioritisation of research gaps themselves, we summarize the mapping results for these sectors here briefly:

No IA relevant projects could be identified for the sectors:
- Regional /Regions
- Food Quality and safety in Europe
- Security

Neither IA projects nor SPI projects could be identified for the following sectors:
FP6
- Coordination of research activities: 0 out of 104 projects
- Life sciences, genomics, biotechnology for health: 0 out of 608 projects
- Information Society Technologies: 0 out of 1251 projects

- Nanotechnologies, Materials, New Processes: 0 out of 402 projects
- Research Infrastructures: 0 out of 149 projects
- Science and Society: 0 out of 173 projects

FP7
- Coordination: 0 out of 15 projects
- Health: 0 out of 419 projects
- Information and Communication Technologies: 0 out of 1049 projects
- Infrastructures: 0 out of 185 projects
- Joint Technology Initiatives: 0 out of 16 projects
- Nanosciences, Nanotechnologies, Materials and new Production Technologies: 0 out of 362 projects,
- Science in Society: 0 out of 89 projects

Impact areas

The IA projects from all sectors for which they were identified develop and apply tools that cover all 35 impact areas including sustainable development in general. The aggregate overview is the following:

- Environmental impact areas rank first with a total of 166 hits (lead: land use with 20 hits),
- Economic impact areas rank second with a total of 125 hits (lead: specific sectors and regions with 18 hits),
- Social impact areas rank third with a total of 91 hits (lead: public health and safety with 12 hits).

Sustainable development in general has 18 hits. Thus, despite the recent experiences with the application of tools in the IA process – mainly economic tools – tools for environmental and social impact areas are available and - theoretically - could be used in the IA process.

With view to the impact areas, the discussion of the central research needs should focus on:
- Identification of barriers concerning the use of these existing tools in the IA process (taking into account the view of users and researchers),
- Definition of clear criteria for scientists to develop a "policy-relevant tool" which is actually applied by the users,
- What is the reason that some impact areas are covered less in this comparison (8 to 10 hits) and does it mean that an increase in the number of tools should be a target? This applies specifically to:

  Economy:
  - Competitiveness, trade and investment flows
  - Administrative burdens on businesses
  - Public authorities
  - Property rights
  - Innovation and research
  - Third countries and international relations
  Social:
  - Employment and labour markets
  - Standards and rights related to job quality
  - Social inclusion and protection of particular groups

- Gender equality, equality treatment and opportunities, non – discrimination
- Individuals, private and family life, personal data
- Governance, participation, good administration, access to justice, media and ethics
- Crime, Terrorism and Security
- Access to and effects on social protection, health and educational systems
- Culture
- Social impacts in third countries

Environment:
- The environmental consequences of firms and consumers
- Waste production / generation / recycling
- The likelihood or scale of environmental risks
- Animal welfare
- International environmental impacts.

Tools

The mapping results show that projects especially develop and apply three tool categories: scenarios, modeling and accounting tools (between 16 and 29 hits). In contrast, participatory tools, multi-criteria analysis and cost benefit analysis are poorly addressed (two to four hits). Six tools could not be categorized (see table 36 in D2.2 for more detail).

With a view to tools, the discussion of the central research needs should focus on the
- assessment of relevance of and options to increase participatory tools, multi-criteria analysis, cost benefit analysis within research on IA tools and the assessment framework in general,
- identification of reasons why several tools could not be linked to the tool categories used, thereby questioning, amending or adapting the categories defined by the project 'SustainabilityA-Test'.

Policies and policy areas

The IA tools covered a variety of policies, where the policy area of agriculture and related topics has a clear lead (13 hits):
- Agricultural policies and related policy areas/ land use (incl. Forestry): 14
- SD policies (with environment): 5
- Environment and health policies: 5
- Biodiversity aspects: 4
- Research and Innovation: 4
- Transport: 4
- Energy: 3
- Water: 2
- Not specified: 6

Three policy areas are covered once: (1) climate, (2) consumption, production and trade in the EU and (3) post-2006 Structural Funds Programme.

With view to policies and policy areas, the discussion of the central research needs should focus on

- Identification of the tools that are currently used in policies / policy areas that are poorly covered by the tools developed in FP6 and 7 to learn about the actual need for new tools for specific policies,
- Identification of transferability of the tools with a focus on a specific policy/ policy area to other policies/ policy areas and development of criteria to facilitate such a transfer.

Governance level

The focus of the projects lies clearly at EU level. Only about 1/5 of the projects address member states, but some projects have a joint focus on the EU as well as member states. Non-EU counties are also covered by four projects as well as the regional level within the EU. Specifically, the projects focus on the following levels:

- EU: 44
- Member states: 8
- Non-EU, new EU member/ pre-accession countries, Developing countries: 4
- Regional: 4
- Local: 2
- Global: 1
- Not specified/ not clear: 7

In terms of governance levels, the discussion on central research needs thus should focus on opportunities for a transfer of tool use of the EU experience to other governance levels (international, non-EU countries) or across member states (following emerging national IA activities).

4. Research gaps from research community

The idea for this part of the research need identification is that each WP2 partner assumes responsibility for a certain policy theme. Main tasks are to identify and discuss research needs, provide recommendations for activities related to the short list of the project mapping and the wider research community related to this sector or discipline.

In the first version of this deliverable we start with an example: WP2 partner UBO is active in the community for modelling impacts of agro-environmental policies. Some of the related economic modelling tools are regularly used in the outlook and agricultural policy reform process in the European Commission. Interdisciplinary tools or model chains targeting analysis of economic and environmental impacts simultaneously (Van Ittersum et al. 2008; Britz et al. 2010) have been or are currently developed. Their inclusion in a formal IA seems to not have occurred at this point, but there is a chance that economic modelling tools will be used in the IA of the legal proposals following the commission's communication on the 2013 reform of the Common Agricultural Policy (European Commission, 2010) coming out within the next weeks.

The communication from November 2010 sets the framework for the upcoming policy reform in 2013 but probably already has implications for the direction of policy changes considered in 2020. Consequently, the communication and the upcoming legal proposal could also give some orientation on the longer term IA requirements in the field of agricultural policy. The communication defines three key challenges for the future:

(1) Food security: in view of the rising demand for agricultural products, the EU shall at least maintain its production capacity.

(2) Environment and climate change: agriculture provides important public goods (landscapes, farmland biodiversity, etc.) but at the same time puts different pressures on the environment (water depletion and pollution, biodiversity loss,...). Regarding climate change, challenges relate to the multiple roles of agriculture in mitigating CO_2 emissions (carbon sequestration, bio-energy production), but also in adapting management practices to changing climate conditions in Europe.

(3) Territorial balance: despite increasing relevance of non-agricultural activities for rural regions, a vital and competitive dynamic farming sector is seen as essential for regional development.

In view of these challenges, the commission defines three strongly corresponding objectives of the reform: viable food production, sustainable management of natural resources and climate action, and a balanced territorial development.

The policy instruments envisaged to achieve these objectives are a mix of previously used measures, some modifications of traditional means and some new instruments. It is mainly the modifications and new measures that constitute challenges for quantitative assessment tools.

Direct payments will continue to be used as a basic income support measure. However, they are suggested being modified in various ways:

- Application of a 'capping' to avoid very large payments to single farms
- Provision of additional payments if specific 'natural constraints' apply to certain regions
- Some payments may continue to be coupled to production if certain farming systems are considered of vital importance
- In addition to the agri-environmental measures in pillar 2 of the CAP, an intended 'greening' of the direct payments is foreseen with mandatory environmental measures related to, for example, permanent pasture, green cover, crop rotation and ecological set-aside.

Market measures such as intervention purchases shall be kept, but undergo some simplification and streamlining. As these measures were targeted towards longer term price support in past years, they now shall be used to manage short term market crises (price fluctuation).

Fitting to this orientation are the considered changes regarding *rural development measures* (second pillar of the CAP). A risk management toolkit shall be added to deal more effectively with income uncertainties and market volatility. The instruments could be WTO compatible income stabilization schemes or support to insurance instruments. A small additional modification to the otherwise rather stable objectives and types of measures considered is a more climate change oriented tools.

These considered modifications of old policy instruments and the new measures define specific challenges for quantitative impact assessment tools which constitute short and longer term research needs for the evaluation of agricultural policy reforms:

- Even though there exist tools to evaluate the impact of direct payments on regional farm income and production at EU level, the capping requires additional information on farm structure and corresponding farm distribution of payments within regions.
- The greening measures are potentially difficult to handle with current economically oriented assessment tools. For example, the modelling of a measure requiring a certain diversity of crops at farm level requires knowledge on – again – the distribution of current farm level rotations to assess impacts at regional and market level.
- Even though economists have analysed the impact of risk on production decisions for decades and currently make considerable progress in making these analyses more realistic, there nevertheless does not exist a tool at EU market level that can capture the impact of risk management tools on agricultural supply behaviour. With the new relevance of market price volatility and related policy instruments – not only in the EU – new efforts to develop robust risk specification capturing the aggregate level implications of the distribution of farm level risk behaviour are worthwhile.

Overall, there is a strong need to include more information on the farm level distribution of behavioural and production indicators into the data bases and model specifications of aggregate economics assessment tools of the agricultural sector.

For future version of this deliverables, other policy areas of responsibility will be defined for each WP2 partner. Furthermore, the implementation of a brainstorming workshop ("sand pit") for research proposals with partners from various disciplines will be discussed as a tool to support creativity in generating relevant research ideas. This type of process has been used by the UK Research Council.

5. Research needs from user community

Based on the same responsibilities for policy themes as employed for identifying research needs from the research community, WP2 partners give a brief, structured overview on research topics considered relevant by users or potential users of IA tools in the respective field.

In an exemplary fashion, this is done here for the areas agricultural and agri-environmental policy by extracting information from recent (2010/2011) research tenders issued by the relevant directorates and agencies of the European Commission (DGAgri, DGEnvironment and JRC).

In order to avoid a backward orientation in identifying user needs, the analysis of tenders is restricted to very recent ones or to information available on upcoming ones.

Table 3: Summary of recent tenders

Tenders in 2011	Tenders in 2010
DGAgri (9)	DGAgri (3)
DGEnvironment (4)	DGEnvironment (11)
JRC (9)	

Tenders from the DGAgri include social, economic as well as environmental impacts. Tenders from DGEnvironment focus mainly on environmental impacts. Tenders from the JRC focus mainly on economic impacts.

Due to the focus of the three different research institutions we have here a focus on either agricultural or environmental policies.

DGAgri addresses mainly the EU and the Member States as governance level. The addressed governance level especially for tenders from the DGEnvironment ranges from EU to Member States as well as non-EU countries. Tenders from the JRC focus mainly on EU and Member State levels.

When giving the tenders of DGAgri a more detailed look at it becomes clear that the addressed policy themes are mainly the analysis of the Common Agricultural Policy (CAP). Identified research needs are the identification of indicators and valuation techniques for assessing the impact of CAP. A detailed overview is given in Table 4.

Table 4: DGAgri Tenders

		Tenders	Policy themes	Research needs
DGAgri	2010	Framework contract for communication activities	-----	-----
		Framework contract for the purchase of data and information on agricultural markets, freight and trade	Common Agricultural Policy (CAP) of the EU	-----
		Framework contract for organisation of the Commission's participation in fairs and events	Common Agricultural Policy (CAP) of the EU	-----
	2011	Evaluation of Common Agricultural Policy measures applied to the wine sector	Common Agricultural Policy (CAP) of the EU	Indicators, valuation techniques
		Evaluation of the school fruit scheme	-----	Indicators, valuation techniques
		Synthesis of mid-term evaluations of Rural Development Programmes 2007–2013	Agri-environmental policies at different administrative levels	-----
		'Ex post' evaluation of the EU forest action plan	Common Agricultural Policy (CAP) of the EU	Indicators, valuation techniques
		Measuring water content in poultry meat	Agri-environmental policies at different administrative levels	-----
		Value of production of agricultural products and foodstuffs, wines, aromatised wines and spirits protected by a geographical indication	Agri-environmental policies at different administrative levels	Indicators, data availability, data quality (incl. Monitoring)
		Price transmission in the sugar sector	Common Agricultural Policy (CAP) of the EU	-----
		Assessing farmers' costs of compliance with EU legislation in the fields of environment, animal welfare and food safety	Agri-environmental policies at different administrative levels	-----

The Joint Research Centre is the scientific and technical arm of the European Commission. It is providing the scientific advice and technical know-how to support a wide range of EU policies. Therefore, research focuses mainly on modelling techniques or the identification of valuation approaches (Table 5). Addressed policy themes are quite diversified.

Table 5: JRC Tenders

		Tenders	Policy themes	Research needs
JRC	2011	Crop Production Forecasts and Climate Change Impact	Common Agricultural Policy (CAP) of the EU	Models, modelling techniques
		Fisheries Management and Enforcement	Agri-environmental policies at different administrative levels	Data availablility, data quality (incl. Monitoring)
		Sustainable Agriculture and Rural Development: the socio-economic dimension	Agri-environmental policies at different administrative levels	Models, modelling techniques
		New Technologies in Agriculture - their agronomic and socio-economic impact	Biodiversity	Valuation techniques
		Geo-Information Management and Control Methods	Common Agricultural Policy (CAP) of the EU	Valuation techniques
		Protection and Conservation of European Seas	Efficient and sustainable water use	Data availability, data quality (incl. Monitoring)
		Integration of Environment Concerns into Agriculture	Common Agricultural Policy (CAP) of the EU	Process knowledge, causal chain relationships of human-environment interactions
		Support to Agricultural Trade and Market Policies	Common Agricultural Policy (CAP) of the EU	Models, modelling techniques

Policy themes covered by tenders of DGEnvironment over the last two years are mainly 'Biodiversity' and the 'Efficient and sustainable water usage' (Table 6). Thereby, the interdisciplinary integration appears to be a main research requirement for achieving well-founded results.

Table 6: DGEnvironment Tenders

		Tenders	Policy themes	Research needs
DGEnvironment	2010	Impacts of Reducing Emissions from Deforestation and Forest Degradation and Enhancing Carbon Stocks	Climate change mitigation	Indicators, data availability, data quality (incl. Monitoring)
		Visions of land use Transitions in Europe	Agri-environmental policies at different administrative levels	Scenarios, systems boundary conditions and dynamics
		Africa at a meso-scale: Adaptive and integrated tools and strategies for natural resources management	Efficient and sustainable water use	Intergration of quantitative and qulitative knowledge
		Evaluating Economic Policy Instruments for Sustainable Water Management in Europe	Efficient and sustainable water use	Valuation techiques
		Ecological Function and Biodiversity Indicators in European Soils	Biodiversity	Indicators, participatory methods
		Developing a Knowledge Network for EUropean expertise on biodiversity and ecosystem services to inform policy making economic sectors	Biodiversity	Indicators, data availability, data quality (incl. Monitoring)
		Water Harvesting for Rainfed Africa: investing in dryland agriculture for growth and resilience	Efficient and sustainable water use	-----
		Water Harvesting Technologies Revisited: Potentials for Innovations, Improvements and Upscaling in Sub-Saharan Africa	Efficient and sustainable water use	Valuation techniques, participatory methods, interdisciplinary interaction, integartion
		Enhancing Robustness and Model Integration for the Assessment of Global Environmental Change	Policies to support sustainable climate change adaptation	Models, modelling techniques, interdisciplinary interaction, integration
		Compiling and Refining Environmental and Economic Accounts (CREEA)	Agri-environmental policies at different administrative levels	Data availablility, data quality (incl. Monitoring), Integration of quantitative and qualitative knowledge
		Knowledge brokerage to promote sustainable food consumption and production: linking scientists, policymakers and civil society organisations	Agri-environmental policies at different administrative levels	-----
	2011	Motivational strength of ecosystem services and alternative ways to express the value of Biodiversity	Biodiversity	Integration of quantitative and qualitative knowledge
		Biodiversity and Ecosystem Services: Arguments for our future Environment	Biodiversity	Integration of quantitative and qualitative knowledge, Interdisciplinary interaction, integration
		Assessment of Policy Impacts on Sustainability in Europe	Agri-environmental policies at different administrative levels	Valuation techniques, knowledge integration methods
		Ecosystem-based strategies and innovations in water governance networks for adaptation to climate change in Latin American Landscapes	Policies to support sustainable climate change adaptation	Models, modelling techniques, knowledge integration methods

Regarding next round of FP7 tenders in the area of the 'Knowledge Based Bio-Economy' (KBBE) area, the following mapping can be undertaken (Table 7).

Table 7: Next round of FP7 tenders (still 'confidential' but coming out in July with likely deadline November)

Policy themes	Tenders FP7	Impact areas	Research needs
Common Agricultural Policy (CAP) of the EU	Volatility of agricultural commodity markets	---------	Models, modelling techniques, Interdisciplinary interaction, integration
	Short chain delivery of food for urban-peri-urban areas		Participatory methods
Agri-environmental policies at different administrative levels	Animal and farm-centric approach to precision livestock farming in Europe	economic and social terms	Models, modelling techniques, Indicators, Interdisciplinary interaction, integration
	Vineyard agronomic management and breeding for improved grape quality to reinforce competitiveness of the winegrowing sector	---------	Indicators, Thresholds, tipping points
	Development and application of methodologies and tools, including indicators, for the assessment of environmental impacts of rural development programmes in the EU	environment	Models, modelling techniques
	Development and evaluation of risk-based surveillance models for defining more cost-	socio-economic	Models, modelling techniques
	Food from organic and conventional production systems and genetically modified food — Comparative analysis of the supply chains	all areas	Data availability, data quality (incl. Monitoring), Interdisciplinary interaction, integration
	Systematic review of risks and benefits of GMOs	environment and social terms	Integration of quantitative and qualitative knowledge
Policies to support sustainable climate change adaptation	ERA-NET+ on Innovation in the forest-based sector for increasing resource efficiency and tackling climate change with competitive customer solutions.	environment	Knowledge integration methods
Climate change mitigation	Development of management strategies for planted and managed forests to increase mitigation capacity	environmental, economic and social	Indicators, Scenarios, Systems boundary conditions and dynamics
Policies targeted at reducing nutrient emissions	Plant growth-promoting bio-effectors (microorganisms and active natural compounds) for alternative plant nutrition strategies in non-leguminous crops.	environment	Scenarios, Systems boundary conditions and dynamics
Water quality	Microbially safe water for human consumption	environment	Interdisciplinary interaction, integration
Efficient and sustainable water use	Precision technologies to improve irrigation management and increase water productivity in major water-demanding crops in Europe	---------	Interdisciplinary interaction, integration, Models, modelling techniques
	Improved water stress tolerance of crop plants	---------	Participatory methods
Biofuel support policies	Development of new or improved logistics for lignocellulosic biomass harvest, storage and transport	all areas	---------
	Design of a systems analysis tools framework for the EU bio-based economy strategy	all areas	Indicators, Data availability, data quality (incl. Monitoring)
	Multipurpose crops for industrial bioproducts and biomass	---------	Participatory methods
Biodiversity	Improving seeds for agriculture and conservation activities	environment	Interdisciplinary interaction, integration
	Managing semi-natural habitats and on-farm biodiversity to optimise ecological services	environment	Process knowledge, causal chain relationships of human-environment interactions
	Multipurpose trees and non-wood forest products for an innovative forestry in rural areas	environment and economic	Knowledge integration methods
	Integrating the role of benthic systems in fisheries management	environment	Scenarios, Systems boundary conditions and dynamics, Models, modelling techniques
	Providing molecular tools for monitoring the potential genetic impact of aquaculture on native populations	environment	Data availability, data quality (incl. Monitoring), Models, modelling techniques

Note: Tenders are taken out of the KBBE work program

In future versions of this deliverable, the collection of tenders may be complemented in some cases by drawing on selected calls from national governments. Additionally, some (uncertain) information on upcoming themes and calls in the context of DG Research's Framework Program 8 is likely available in the LIAISE partnership through interactions with national contact points or users influencing the process.

Whenever possible, the overview will also include information from more informal interactions with users in other contexts allowing for the extraction of forward looking research needs.

In a less theme-oriented exercise, the already mentioned analysis of best-practice examples of IA will serve the identification of user needs associated with the IA process.

6. Summary and brief evaluation of methods and results

This first version of the deliverable D.2.3 on research needs can be seen as an explorative exercise contributing to the understanding of how different methodologies may contribute to the identification of research gaps. The approaches included a survey of research questions seen as important by the different work packages in LIAISE, results of a detailed mapping of many hundreds of projects from the EU research framework programs 6 and 7 identifying IA-tool and process related contents, the expert view on necessary developments of tools in view of upcoming policy challenges exemplified for the agricultural policy area, and finally a user oriented analysis based on recent tenders by European institutions active in the area of agri-environmental policies.

Overall, it should be said that the "synthesis" part mentioned in the deliverable's title has not strongly materialised in this fist version, at least with respect to the synthesis of results across the different methodologies. This is probably mainly due to the delay-related lack of critical reflection within WP2 on the first draft. It has been suggested to structure future versions rather based on categories of research needs (impact areas, tool improvements...) than detection methods. This will be carefully discussed in the next few weeks.

Another general observation is that currently most of the applied methodologies have - by design - a backward bias in identifying research gaps. The mapping of FP6 and FP7 projects but also even the analysis of more recent tenders by EU institutions implicitly draw on results of earlier research agenda identifying processes and identified gaps based on these data might have limits in adding substance to currently ongoing processes (e.g. FP8 development or other national and international initiatives). Also the policy oriented view may come up with too short term oriented research needs that do not help to guide longer term tool development (for example the 'capping' of direct payments. However, with this methodology in general it might help to look at the longer term development of policies. For example, EU agricultural policies moved toward more market orientation already for two decades and the related issues (price volatility, risk, food security) will

also have longer term implications for the tools required. These general tendencies should also be identifiable in the context of other policy areas.

Finally, the survey of LIAISE work packages revealed a strong orientation on understanding and improving the IA process and the Science policy interface, but also the other methods applied mainly often came up with more general types of research gaps. These results give limited guidance for the concrete tool improvement and development envisaged in the context of LIAISE, but also for later research agenda setting exercises. We expect more specific additions on relevant needs of tool improvements in the upcoming interaction with WP3 but also by intensifying expert oriented and forward looking approaches to identifying research gaps.

References

Britz, W., Pèrez Dominguez, I. and T. Heckelei (2010), 'A Comparison of CAPRI and SEAMLESS-IF as Integrated Modelling Systems', Brouwer, F.M., van Ittersum, M. (Eds.), *Environmental and Agricultural Modelling: Integrated Approaches for Policy Impact Assessment*, Dordrecht: Springer, 257-274.

European Commission (2010): The CAP towards 2020: Meeting the food, natural resources and territorial challenges of the future. Communication. Communication from the Commission to the European parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, November 18.

Podhora, A., Helming, K. (2010): Methodological framework for WP2 activities. LIAISE deliverable D2.1.

Podhora, A., Helming, K. (2011): Analysis of the overview of research groups/ networks producing knowledge of relevancy for impact assessment tools and processes. LIAISE deliverable D2.2.

Turnpenny, J., Radaelli, C.M., Jordan, A., Jacob, A. (2009): The policy and politics of policy appraisal: emerging trend and new directions. Journal of European Public Policy (16):4,640-653.

Van Ittersum, M., Ewert, F., Heckelei, T., Wery, J., Alkan Olsson, J., Andersen, E., Bezlepkina, I., Brouwer, F., Donatelli, M., Flichmann, G., Olsson, L., Emilio Rizzoli, A., Van der Wal, T., Wien, J.E. and J. Wolf (2008): Integrated assessment of agricultural systems – A component-based framework for the European Union (SEAMLESS), *Agricultural Systems,* 96 (1-3), 150-165.

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