ORIENTATION PAPER 2012

DRAFT AS OF 20/06/2012

COOPERATION

THEME 2

FOOD, AGRICULTURE AND FISHERIES, AND BIOTECHNOLOGY

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Objective:

Building a European Knowledge Based Bio-Economy[1] by bringing together science, industry and other stakeholders, to exploit new and emerging research opportunities that address social, environmental and economic challenges: the growing demand for safer, healthier, higher quality food and for sustainable use and production of renewable bio-resources, the increasing risk of epizootic and zoonotic diseases and food related disorders; threats to the sustainability and security of agricultural, aquaculture and fisheries production; and the increasing demand for high quality food, taking into account animal welfare and rural and coastal context and response to specific dietary needs of consumers.

I CONTEXT

Innovation Union aspects

The Innovation Union initiative underlines that research and innovation are key drivers of competitiveness, jobs, sustainable growth and social progress. The work programme 2012 has been designed to support the implementation of the Innovation Union Initiative and in particular to bring together research and innovation to address major challenges.

The work programme can contribute to the innovation objective in two ways, and constitutes a significant change to the approach in earlier work programmes:

1/ By supporting more topics aimed at generating knowledge to deliver new and more innovative products, processes and services. This will include pilot, demonstration and validation activities.

The focus on innovation will be reflected in the description of the objectives and scope of the specific topics, as well as in the expected impact statements. The innovation dimension of the proposals will be evaluated under the evaluation criterion 'Impact'.

2/ By identifying and addressing exploitation issues, like capabilities for innovation and dissemination, and by enhancing the use of the generated knowledge (protection of intellectual property rights like patenting, preparing standards, etc).

Information on the Risk-Sharing Finance Facility (RSFF), an innovative financial instrument under FP7, is available on line[2]. The Commission will respond to further needs of potential beneficiaries for information on the RSFF (by, e.g., awareness-raising activities in conjunction with the European Investment Bank, participation to thematic events).

Approach for 2012

The FP7 Theme 2 work programme 2012 (hereafter WP2012) should be understood in the context of underpinning the goals of Europe 2020, in particular with respect to the 'Innovation Union' flagship initiative. This flagship initiative presents one of the engines of the EU's growth strategy for the coming decade. The European bio-based economy has an approximate market size of over EUR 1.5 trillion, employing more than 22 million people and is therefore an essential component of this growth strategy.

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1 The term 'bio-economy' includes all industries and branches of the economy that produce, manage or otherwise harness biological resources (and related services, supply or consumer industries), such as agriculture, food, fisheries and other marine resources, forestry.

2 http://www.eib.org/products/loans/special/rsff/?lang=en and http://ec.europa.eu/invest-in-research/funding/funding02_en.htm

This work programme promotes world leadership in European Knowledge Based Bio-Economy (KBBE) research and aims at technological breakthroughs that support the competitiveness of the European bio-economy industry. Compared to previous years, this work programme puts substantially more emphasis on the foundation that research provides to innovation. It does so primarily by advancing the participation of SMEs as active stakeholders in the research with a view to apply and exploit the results in their innovation projects.

The topics in WP2012 support the development of a sustainable European KBBE and contribute to the Europe 2020 strategy and the Innovation Union, in particular by (i) moving towards the completion of the European Research Area in the bio-based economy sectors (ii) linking the existing and new initiatives in the bio-based economy field such as joint programming, Lead Market, Innovation Partnership into a coherent policy framework (iii) stimulating innovation including promotion of knowledge transfer; (iv) contributing to the EU policies e.g. Common Agricultural Policy (CAP); reform of the Common Fisheries Policy (CFP); Integrated Maritime Policy (IMP); Community Animal Health Policy (CAHP); Key Enabling Technologies (KETs), regulatory frameworks to protect the environment, health and safety; regulatory frameworks related to resource efficiency and waste; (v) and supporting international initiatives such as the Millennium Development Goals and Global Research Alliance on Agricultural Greenhouse Gases.

A convergent and coordinated approach addresses four important and KBBE-related **challenges** facing society today:

1. **Sustainable primary production[3]; mitigating and adapting to climate change**

Research on productivity and management is better connected with the function, use and protection of natural resources (water, soil, biodiversity) as well as with socio-economic considerations. Research towards greenhouse gas reduction focuses on better understanding of the carbon sequestration and mitigation potential of soils and agricultural/forestry biomass production. Livestock reproduction and nutrition efficiency are targeted in order to ensure efficient and sustainable production. In animal health including zoonoses, targeted research efforts continue notably on African Swine Fever and risk-based surveillance models. Socio-economic research supports tools for transitions in agricultural systems. Research in the forest and agricultural sectors encourages innovations along the "discovery to translation" pipeline, including for example participatory farm based innovation systems and novel precision farming technologies Research in Fisheries focuses on benthic ecosystems and innovative tools for improving overall fisheries management. The regional scale of fisheries management will be tackled by the BONUS Article 185[4]. Aquaculture research addresses fish diseases as well as the assessment and monotoring of the potential genetic impact of farmed fish on wild populations (including in a restocking context).

2. **Low carbon and resource efficient industry**

Biotechnology as key enabling technology for developing a low-carbon and resource-efficient industry focuses on: (i) bioprospecting and exploiting the huge potential of terrestrial and marine biodiversity for innovative industrial and environmental applications; (ii) developing resource-efficient industrial bioprocesses; (iii) developing novel green biomaterials; (iv)

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[3] Primary production including agriculture (crops, farm animals), forestry, fisheries/aquaculture

[4] COM(2009)610 final. Decision of the European Parliament and of the Council on the participation by the Community in a Joint Baltic Sea Research and Development Programme (BONUS-169) undertaken by several Member States

supporting emerging trends in biotechnology (such as systems biology) for maintaining front line innovation and industrial competitiveness. Research to overcome bottlenecks to innovation (standardisation) and demonstration/proof-of-concept actions to reduce the time-to-innovation period of biotechnological applications in industrial sectors are foreseen. In Marine biotechnologies, innovative bio-discovery pipelines for novel products and cultivation efficiency of marine microorganisms are a priority. The emphasis is also on tackling oil spills and degradation of synthetic polymers.

3. Food security and safety for Europe and beyond

Food security is addressed prioritising climate change mitigation and adaptation aspects. Similarly, significant efforts are deployed to decrease harvest losses through prevention and protection from diseases, taking into account a wide range of biological, physical, chemical and management tools. Insects are explored as a potential protein source, and research is done on causes and amounts of food waste. Food safety challenges are addressed by assuring water and seafood safety, also on a global basis, and improving quality and developing and validating tools for risk analysis. Contaminants in seafood are also addressed. Innovation actions target the exploitation of former FP project results.

4. Socially inclusive and healthy Europe

The food area is very well suited to unlock the potential of technical and social innovation in many products and services. Priority is given to research on bioactives, disease prevention, targeting of vulnerable groups such as the elderly, and investigating the links between lifestyle, diet, health and well-being. With respect to rural development, the delivery of public goods, ecological corridors, peri-urban agriculture and short circuit delivery of food is addressed, while the strengthening of the contribution of fishing and aquaculture in social and economic welfare of European coastal areas continues.

Innovation dimension of the activities:

In line with the strong importance attached to developing an integrated approach to research and innovation in the Europe 2020 strategy, activities to bridge the gap between discovery and market up-take, including effective communication, dissemination, knowledge transfer and strengthening participation of industry, in particular SMEs, are reflected throughout all topics. Demonstration activities, proofs-of-concept and assessments of the technical and economic viability of the know-how produced are part of several topics (e.g. in the areas of industrial biotechnologies and biorefineries).

The strong innovation focus of this work programme corresponds in many aspects to the conclusions of the European Council of the 4th of February 2011:

- In the area of food, agriculture and fisheries, and biotechnology, the involvement of industry and in particular SMEs is crucial to translate research and innovation into market applications, and it is therefore strongly promoted. Technological innovation should therefore lead to added value for SMEs in the market place. Two types of actions are applied to ensure appropriate SME participation: i) a large number of topics require mandatory participation of SMEs. These topics specify the share of EU contributions that shall be spent by SME participants (threshold from 10 to 75 %); ii) several topics highlight that the participation of SMEs might be beneficial to achieve the expected impact of the project. Demonstration actions, which are suitable to support close-to-market developments, are recommended or compulsory in several topics (e.g. on feed production from food waste).

- Various actions support the dissemination and take-up of research results, involving the different players: industry, regulators, SMEs, farmers, fishermen, consumer organisations and policy makers. Two topics deal specifically with the exploitation by SMEs of FP research

results in agriculture, forestry, fisheries and aquaculture and food processing, and can contribute to the development of Intellectual Property Rights valorisation instruments, in particular for SMEs.

- This work programme makes also an effort to boost the design and implementation of creative ways of meeting social needs. Five topics specifically request that projects should lead to social innovation, in particular in the fields of food and agriculture.

- In view of progressing towards the completion of the European Research Area, two topics would be able to support the Commission Recommendation on the Joint Programming Initiative 'A Healthy Diet for A Healthy Life' and any potential Commission Recommendation on the Joint Programming Initiative which would address the 'healthy and productive seas and oceans'. Coordination of national programmes is also reinforced through two ERANETs (on "sustainable exploitation of marine resources in the seafood chains" and on "Systems Biology") and one ERANET+ (on "Innovation in the forest-based sector for increasing resource efficiency and tackling climate change"). This work programme requests also that a particular effort is made to integrate research in Europe, through the development of training programmes, and support to networking and brokerage events.

- Activities of this work programme could also potentially contribute to European Innovation Partnerships to be developed, in particular on a Water-Efficient Europe, on the Sustainable supply of non-energy raw materials for a Modern Society and on Agricultural productivity and sustainability.

- Innovation can also be strengthened by considering the inclusion of pre- and co-normative research tasks and the integration of standardisation organisations. Standardisation activities (mandatory or encouraged in ten topics of this work programme) can help to foster the access to market for innovative solutions and, as a result, ensure practical application of research results.

Research projects funded under this work programme will also contribute to the regional policy of the European Union. By exploiting structural funds, topics such as "Multipurpose crops for industrial bioproducts and biomass" can lead to the development of a network of bio-refineries throughout Europe.

International Cooperation

International cooperation is supported and encouraged throughout all the activities and all topics are open to third countries participation. Bilateral programme-level co-operation is fostered with India and China, in coordination with member States' activities and in line with the scope and priorities of the Strategic Forum for International S&T Co-operation[5] (e.g. topic on "biotechnological waste-water treatments and reuse in agronomical systems" with India and partnering initiative on fibre crops with China). Multilateral co-operation is encouraged with major trading partners (e.g. standardisation for bio-based products) or to tackle global challenges (e.g. global food safety). Activities are foreseen to contribute to the MDGs – particularly of tackling hunger and ensuring environmental sustainability - and on issues for mutually beneficial collaboration with developing countries (e.g. neglected zoonotic diseases, biowaste, insects as novel sources of proteins). Cooperation with industrialised countries focuses on new emerging fields and shared challenges[6]. Twinning will continue between FP

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[5] OJ C18 of 24.1.2009, p. 11.

[6] A financial contribution may be granted by the European Union in the case of a participating international organisation other than an international European interest organisation, or a legal entity established in a third country other than an international cooperation partner country, such as Australia, Canada, New Zealand,

projects and similar projects funded by third countries, as an activity of programme-level co-operation to systematically link the research and innovation activities between the EU and strategic third countries partners[7].

Cross-thematic approaches

A joint topic with Theme 5 (Energy) supports the "Development of new or improved logistics for lignocellulosic biomass harvesting, storage and transport" and has strong complementarities with another topic on "multipurpose crops for industrial bioproducts". A joint topic with Theme 4 (Nanosciences, nanotechnologies, materials and new production technologies-NMP) on "innovation in the forest-based sector for increasing resource efficiency" is also included.

Cross-thematic approaches under "The Ocean of Tomorrow"

Following the two previous "The Ocean of Tomorrow" cross-thematic calls, several topics will be launched to support the implementation of the Marine Strategy Framework Directive (2008/56/EC)[8]. Cooperation will involve Theme 2 Food, Agriculture, Fisheries and biotechnology, Theme 5 Energy, Theme 6 Environment, (including climate change), and Theme 7 Transport (including Aeronautics). "The Ocean of Tomorrow" related topics are implemented in the framework of "the European strategy for marine and maritime research[9]". The focus will be on research gaps about the definition and monitoring of the "Good Environment Status" (GES) of EU waters, to be achieved by 2020. Special attention should also be given to the investigation of mitigation measures and SME participation whenever relevant.

Synergies and/or complementarities among projects selected for funding will be encouraged within the same theme or across themes. For information on "The Ocean of Tomorrow" related topics in other themes, see the corresponding work programme chapters[10].

The topics considered under Theme 2 Food, Agriculture, Fisheries and biotechnology are:

KBBE.2012.1.2-09	Integrating the role of marine benthic systems in fisheries management (The Ocean of Tomorrow)
KBBE.2012.1.2-12	Providing molecular tools for assessing and monitoring the potential genetic impact of aquaculture on native populations (The Ocean of Tomorrow)
KBBE.2012.2.4-01	Contaminants in seafood and their impact on public health (The Ocean of Tomorrow)
KBBE.2012.3.5-01	Innovative biotechnologies for tackling oil spill disasters (The Ocean of Tomorrow)

United States, etc, provided that such a contribution is essential for carrying out the indirect action. For more information please see Article 29 of the EU FP7 Rules for Participation.

7 The Commission reserves the right to ask the coordinators of FP7 projects, during the grant agreement negotiations, to include collaboration activities with projects financed by these third countries. The costs of these activities are expected to be approximately 1% of the total European Union contribution to these projects. Parallel funding is expected from the related research programmes in the third countries for counterpart projects. Twinnings are currently on going with Canada, Australia and New Zealand on bio-products and food and with Argentina and Mercosur on plants, soil and food research.

8 OJ L164 of 25.6.2008, p.19.

9 COM(2008) 534.

10 'Food, Agriculture and Fisheries, and Biotechnology' (KBBE), 'Energy', 'Environment (including climate change)' and 'Transport (including aeronautics)'

KBBE.2012.3.5-03 Biotechnological solutions for the degradation of synthetic polymeric materials (The Ocean of Tomorrow)

Socio-economic dimension of research

Where relevant, account should be taken of possible socio-economic impacts of research, including its intended and unintended consequences and the inherent risks and opportunities. A sound understanding of this issue should be demonstrated at the level of both research design and research management. In this context, where appropriate, the projects should ensure engagement of relevant stakeholders (e.g. user groups, farmers and fishermen, civil society organisations, policy-makers) as well as stimulate a multi-disciplinary approach (including, where relevant, researchers from social sciences and humanities). The work programme encourages participation by civil society organisations in all topics. Projects raising ethical or security concerns are also encouraged to be attentive to wider public outreach. Research activities should–take into account the Protocol on the Protection and Welfare of Animals, and reduce - with a view to ultimately replacing - the use of animals in research and testing[11]. The principle of the three Rs (Replacement, Reduction and Refinement) should be applied in all research funded by the European Commission.

Participation by women and gender dimension in research

Seeking scientific knowledge and using it to serve society calls for talent, perspectives and insight that can only be secured by increasing diversity in science and the technological workforce. Therefore, equal representation of women and men at all levels in research projects is encouraged. Gender aspects in research are of particular relevance to Theme 2. For example, there may be differences between men and women as regards risk factors, biological mechanisms, behaviour, causes, consequences, management of and communication on diet-related diseases and disorders. Furthermore, roles and responsibilities, the relationship to the resource base (land management, agricultural and forest resources, etc.) and the perception of risks and benefits could have a gender dimension. Applicants should systematically address whether, and to what extent, gender aspects are relevant to the objectives and the methodology of projects. In addition, specific actions to promote gender equality in research can be financed as part of the proposal[12].

[11] Decision No 1982/2006/EC of the European Parliament and of the Council of 18 December 2006 concerning the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007-2013) – OJ L 412 of 30.12.2006, p.1.

[12] Appendix 7 of the Negotiation Guidance Notes [ftp://ftp.cordis.europa.eu/pub/fp7/docs/negotiation_en.pdf]".

II CONTENT OF CALLS

This section describes all the topics for which proposals will be called in this work programme. This concerns only the content of the calls. For the practical modalities related to these calls, please refer to section III 'Implementation of calls'. For actions not implemented through calls for proposals, please refer to section IV 'Other actions'.

Activity 2.1: Sustainable production and management of biological resources from land, forest and aquatic environment

Area 2.1.1 Enabling research

Enabling research on the key long term drivers of sustainable production and management of biological resources (micro-organisms, plants and animals) including the exploitation of biodiversity and of novel bioactive molecules within these biological systems. Research will include 'omics' technologies, such as genomics, proteomics, metabolomics, and converging technologies, and their integration within systems biology approaches, as well as the development of basic tools and technologies, including bioinformatics and relevant databases, and methodologies for identifying varieties within species groups.

KBBE.2012.1.1-01: Improving seeds for agriculture and conservation activities

Call: FP7-KBBE-2012-6 – single stage

Seeds are the largest source for human and animal nutrition and provide the basis for improving agricultural practices and managing genetic resources. High-quality seeds are required for the performance of crop production, propagation and breeding. Seed quality is modulated by changing environmental factors and in particular early stages of seed development are sensitive to environmental stresses such as drought and elevated temperatures. There is a need to further understand the processes determining seed development and key agronomic traits such as dormancy, after-ripening and germination, taking into account the influence of abiotic (including oxidative) stress conditions and resilience to perturbation.

The project will provide a dynamic understanding of the molecular mechanisms and regulatory switchboards controlling seed development and selected quality traits in response to environmental cues. Emphasis shall be placed on the transfer of molecular information from model species to crop plants. In addition, the project shall undertake comparative studies across model, wild and crop plants to explore the existing ecological and natural genetic variation.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

Additional information: One project may be funded.

Expected impact: The project will substantially advance knowledge on the molecular mechanisms determining seed phenotype and key quality traits, in both in-situ and ex-situ environment under varying levels of abiotic stress. It will also enhance our understanding of plant adaptation to the environment, in particular in the context of predicted effects of climate change. Overall, the project will develop innovative tools and methods to improve crop breeding, crop management and conservation activities.

KBBE.2012.1.1-02: Animal and farm-centric approach to precision livestock farming in Europe

Call: FP7-KBBE-2012-6 – single stage

The increasing world-wide demand for animal products of good quality and the increasing societal concerns over animal welfare and health while heavily reducing environmental load and energy use is putting livestock farming under pressure. Previous research has shown that modern technology developed by innovative SMEs has a high potential to address these concerns by using sensors and sensing systems to automatically capture quantitative information directly from the animal and its environment and enable precise husbandry management; this is referred to as Precision Livestock Farming (PLF). However, there remain important issues to be solved: (i) lack of cooperation between animal scientists, veterinarians, bio- and other engineers and economists, (ii) lack of implementable systems which relate sensors, parameter analysis to key indicators on farms, (iii) lack of understanding how PLF creates value for the different stakeholders and end-users and (iv) suitable business models to further adoption of PLF.

The proposed project should through extensive field tests implement, materialise and evaluate an animal and farm-centric approach to innovative terrestrial livestock farming in Europe to improve production efficiency and address concerns about sustainability of terrestrial livestock production and animal health and welfare. It is essential that in the project, industry works together with innovative SMEs and researchers from animal and veterinary science and from engineering with PLF focus and farmers. The project should define, implement and validate through research the following points for at least one terrestrial animal production system:

1. A set of key indicators, in agreement with experts from animal welfare, animal health and productivity and their "golden standards"
2. A set of practical technologies to measure such key indicators
3. Integrated solutions (e.g. software) that, by using relevant key indicators, deliver information for better management and adaptive control of effectors for animal husbandry
4. The social and economic value creation potential of exchanging collected data along the supply chain feed – animal – food
5. Business models for "PLF as a service" in cooperation with farmers associations and other multipliers
6. The role of innovative, hi-tech SMEs in the implementation of PLF as a driving force for innovation in the livestock sector

The project should study how the animal and farm-centric approach creates value for relevant stakeholders in the food chain. The deliverable of the project is a validated blueprint proven through extensive field studies for an animal and farm-centric approach to innovative terrestrial livestock farming in Europe. The blueprint should consider the generic approach of PLF to allow transformation to plant and soil systems and aquaculture.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

Additional eligibility criteria:

– SME-targeted Collaborative Projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 25 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: One project may be funded.

Expected impact: This project should contribute to the understanding of the usefulness of the new technologies in economic and social terms and should provide farmers with clear financial and social incentives to move towards their adoption. The creation of new business models should give rise to a PLF service industry which will assist terrestrial livestock farmers to meet the challenge of producing in a more efficient way and addressing the societal

concerns about livestock production. The exchange of data along the feed – animal – food chain should unlock unused economic potential. The blueprint will help global industry players to transform livestock industry into an innovative sector by collaborating with high-tech SMEs that in turn will be helped to gain access to the world market.

KBBE.2012.1.1-03: Precision technologies to improve irrigation management and increase water productivity in major water-demanding crops in Europe

Call: FP7-KBBE-2012-6 – single stage

Availability of fresh water is one of the elementary conditions for life on earth. But water is a limited resource, which is now put under unprecedented pressure by global population growth and climate change. A wiser use of fresh water becomes now imperative. Irrigated agriculture is one of the major water-consuming sectors and as such, it provides good opportunities for substantial water savings.

The project's aim will be the optimisation of irrigation water use by improving the management of farm scale irrigation equipment - and water release scheduling – taking into account real time soil-water availability, local weather dynamics and crop specific physiological status and water needs. The successful proposal will exploit state-of-the-art techniques and technologies, such as plant and soil water sensor technologies, weather forecast tools, ICT control systems, remote sensing, satellite and GIS technologies, web potentialities and other innovative relevant technologies, for developing and testing integrated and automated precision irrigation supporting tools, models and devices to optimise irrigation water use at farm level. Considering the different research sectors involved in the project – ICT, agronomy, agriculture engineering, climatology, plant science, soil science, etc. – a very broad and interdisciplinary approach, as well as a real and effective integration between the different technologies, will be required, including technology assessment.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

Additional eligibility criteria:

– SME-targeted Collaborative Projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 25 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded. .

Additional information: One project may be funded.

Expected impact: The developed integrated and automated precision irrigation management and decision supporting tools, models and devices, will allow substantial reduction in fresh water use in irrigated agriculture. The project will also contribute to the sustainable use of natural resources and adaptation of agriculture to climate change. A more rational use of water tailored to specific and real time crop needs will also contribute to better quality yields.

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

Increased sustainability and competitiveness, while safeguarding consumer health, decreasing environmental impacts and taking account of climate change, in agriculture, horticulture, forestry, fisheries and aquaculture through the development of new technologies, equipment, monitoring systems, novel plants and production systems, crop management through selected plant breeding, plant health and optimised production systems, the improvement of the scientific and technical basis of fisheries management, and a better understanding of the interaction between different systems (agriculture and forestry; fisheries and aquaculture) across a whole ecosystem approach. Research into maintenance of

autochthonous ecosystems, development of biocontrol agents, and microbiological dimension of biodiversity and metagenomics will be undertaken.
For land based biological resources, special emphasis will be placed on low input (e.g. pesticides and fertilisers), and organic production systems, improved management of resources and novel food and feeds, and novel plants (crops and trees) with respect to their composition, resistance to stress, ecological effect, nutrient and water use efficiency, and architecture. This will be supported through research into biosafety, co-existence and traceability of novel plants systems and products, and monitoring and assessment of impact of genetically modified crops on the environment and human health as well as the possibility of their broader benefit for society. Plant health and crop protection will be improved through better understanding of ecology, biology of pests, diseases, weeds and other threats of phytosanitary relevance and support to controlling disease outbreaks and enhancing sustainable pest and weed management tools and techniques. Improved methods will be developed for monitoring, preservation and enhancement of soil fertility.
For biological resources from aquatic environments, emphasis will be placed on essential biological functions, safe and environmentally friendly production systems and feeds of cultured species and on fisheries biology, dynamics of mixed fisheries, interactions between fisheries activities and the marine ecosystem and on fleet-based, regional and multi-annual management systems.

KBBE.2012.1.2-01: Development of new or improved logistics for lignocellulosic biomass harvest, storage and transport
(*Topic implemented jointly by Themes FAFB and ENERGY but only open in call FP7-KBBE-2012-6 – single stage)*

Call: FP7-KBBE-2012-6 – single stage

The topic aims at the development of new or improved logistics for harvesting, transport and storage for each of the following main raw material types: (1) agricultural residues (e.g. cereal straws, harvested weeds…), (2) forestry residues (e.g. low value forestry wastes) and (3) biomass from energy crops. Each raw material type shall be investigated separately i.e. through an individual project. The projects should include the adaptation of agricultural practices (including sustainable soil management), the development of harvesting machineries adapted to the raw material used (combined harvesting equipment when appropriate), possible on-site pre-treatment of the biomass, storage and transport. The process operations for all the steps from harvesting to transport and storage should be defined and demonstrated at an industrial pilot-scale under real operational conditions.
Environmental (e.g. effect on soil organic content), economic (e.g. potential market for lignocellulosic biomass, economic viability and added value for farmers / forest owners) and social sustainability for the developed logistics shall be assessed, including scenarios for transport distances. The projects shall also investigate the social, economic, regulatory and other barriers to innovation in this area. Proposals will have to include a clear plan for exploitation of the scientific and technical results.
Funding scheme: Collaborative project (small or medium-scale focused research project targeted to SMEs).
Additional eligibility criteria:
- Projects will be selected for funding on the condition that the estimated EU contribution going to SME(s) is 25% or more of the total estimated EU contribution for the project as a whole.

Implementation/management: In order to maximise industrial relevance and impact of the research effort, the active participation of agriculture and forestry sector players, machinery manufacturers and biomass end-users is essential.

Additional information:

– Up to one project will be funded in each of the three raw material types (agricultural residues, forestry residues and energy crops).

Expected impact: The development of improved logistics to harvest, store and transport lignocellulosic biomass for the production of bio-energy and bio-materials is expected to create a market for agriculture and forestry residues, and for energy crops; and to foster the bio-energy market in Europe. The creation of a market for biomass residues is also expected to improve economic conditions at the farm and forestry level.

Projects will deliver practical solutions, implementable in the rural communities across Europe, to the supply of lignocellulosic biomass for bioenergy and bio-materials in an economically, socially, and environmentally sustainable manner. The projects will contribute to the implementation of EU policies, notably with respect to the SET-Plan and the bio-based economy.

KBBE.2012.1.2-02: Managing semi-natural habitats and on-farm biodiversity to optimise ecological services

Call: FP7-KBBE-2012-6 – single stage

In agricultural landscapes, semi-natural habitats such as hedgerows, field margin vegetation, wild flower strips, cover crops, or fallows provide important benefits and services to farmers and society at large e.g. through prevention of nutrient leaching, water regulation, control of soil erosion, landscape features and enhanced in-situ biodiversity. The latter one is considered to be a particularly important ecosystems service for agriculture due to its relevance for the enhancement of pollination and pest control. Despite the above named benefits, there is a continuous loss of semi-natural habitats and levels of functional biodiversity in European landscapes resulting from agricultural intensification, land abandonment and degradation of the landscape infrastructures.

The project will increase knowledge and awareness on the agronomic and ecological importance of semi-natural habitats as well as on farm management practices to increase functional biodiversity and improve farm productivity by:

- Identifying farming systems and landscape patterns likely to enhance biodiversity and other ecological services, where possible taking into account climate change scenarios;
- Describing spatial and temporal interactions between production and semi-natural habitats in relation to farming system intensity (e.g. conventional, integrated, organic);
- Providing management and policy recommendations on appropriate rates and quality of semi-natural habitats, linking the biodiversity to specific functional services (e.g. pollination, pest control, nutrient cycling, soil fertility);
- Designing and demonstrating on-site measures to enhance and use ecological services based on the novel concept of eco-functional intensification. These shall take into account both, the level of diversity in the farming design (productive/non-productive areas) as well as in cropping and grassland systems (intercropping, crop rotations and companion plants). These measures at farm level shall go beyond cross-compliance and contribute to the greening of the Common Agricultural Policy (e.g. permanent pasture, green cover, and ecological set-aside).

Overall, the project shall produce scientific evidence of the different benefits that appropriate management of semi-natural habitats can bring to various types of agricultural production systems (organic, low-input, conventional) taking into account representative landscapes across Europe. Tasks will require a highly interdisciplinary approach including expertise from the areas of (landscape) ecology, modelling experimental crop sciences, farming systems and rural sociology.

Funding Scheme: Collaborative project (small or medium-scale focused research project).
Additional information: Up to two projects may be funded.
Expected impact: The project will provide further evidence on the beneficial services provided by semi-natural habitats to support farmers and local/regional authorities in the appropriate agronomic management of these areas. It will also help demonstrate the potential of different farming systems to substantially enhance the local biodiversity in combination with semi-natural habitats. Through the design of diversified cropping systems it will further help to unlock the potential of eco-functional intensification to achieve more stable yields, reduce pesticide use while also meeting wider environmental objectives at landscape level.
Selected sites in different European locations will provide important opportunities for awareness raising, demonstration and dissemination of results to the relevant target groups (farmers, policy makers, extension services, authorities, NGOs).

KBBE.2012.1.2-03: Plant growth-promoting bio-effectors (microorganisms and active natural compounds) for alternative plant nutrition strategies in non-leguminous crops.
Call: FP7-KBBE-2012-6 – single stage

Soil is one of the most important ecosystems and a non-renewable natural resource. A vital soil provides numerous services to the welfare of society, and it is of fundamental importance for the production of food and feed. The need to increase agricultural production over the past sixty years resulted in the massive use of mineral fertilisers by farmers. Considering the current World population trend, the expected increase in feed and food demand, the limited availability of productive agricultural land, and with a view to reduce the farmers dependence on mineral fertilisers, alternative and viable plant nutrition strategies for the supply of essential macro and micronutrients need to be found. By improving knowledge on plants and bio-effectors interactions and related physiological and chemical mechanisms, the project should enhance the field efficacy of most promising bio-effectors and develop more environmentally friendly practices for alternative plant nutrition strategies. Bio-effectors might contain living microorganisms and active natural compounds, such as soil - and non-soil - bacteria and fungi, microbial residues, plant extracts and exudates, compost extracts, products of biological turnover processes and others, as single ingredient or in mixed formulations. The project should include an adequate plan for field demonstration trials to test the efficacy of the new products in real production conditions and in different geographical situations. The economic viability and sustainability of the proposed alternative plant nutrition strategies should also be assessed, including comparative cost benefit analysis between the new and the conventional approaches.
Funding scheme: Collaborative project (large-scale integrating project targeted to SMEs).
Additional eligibility criteria:

– SME-targeted Collaborative Projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: One project may be funded.
Expected impact: The successful project will contribute to the ecological intensification of agriculture, by developing a viable alternative to mineral fertilisers, thus contributing to the reduction of the negative environmental impact of agricultural production. The project will also improve our understanding on the mechanisms underlying the observed positive effects of beneficial microorganisms and bio-effectors, and will facilitate their practical application by improving their efficacy at field level.

KBBE.2012.1.2-04: Vineyard agronomic management and optimised production systems for improved grape quality to reinforce competitiveness of the winegrowing sector

Call: FP7-KBBE-2012-6 – single stage

Despite the economic importance of vineyards in Europe (first world producer of wine with 65% of the total production - representing 20% of European farms and around 3 Million employees) the wine sector is facing severe challenges from increased global competition. The quality of the grape at harvest has a strong direct impact on wine processing final quality, and its marketability. While high quality wines still represent most of the net balance of wine exports, there is still a lack of quality / market adequacy for a number of vineyards which face severe competition from new producing countries. The overall objective of the topic is to increase the competitiveness of European viticulture through the following actions: (1) improve vineyard agronomic management to ensure better grape quality (grape berry development, ripening, optimisation of time of harvest to retain organoleptic/aroma compounds…) in line with evolving consumer demands; this can lead to optimised production systems for specific grapevine varieties; 2) reinforce agronomic management of plant health issues to improve the sanitary quality of the grape and decrease pesticide application in vineyard and residues in wine; 3) study the adaptation of agronomic practices needed in certain producing areas due to climate change effects; 4) secure technology transfer and best agronomic practices (including guidelines on precision viticulture practices), and their dissemination to farmers and wine making SME's/cooperatives; 5) capitalise on European and international breeding and genomics initiatives to identify new potential for improvement in existing grapevine varieties, and, in a longer term perspective, to contribute to the definition of ideotypes for European grapevine breeding.

The project should take into account the different European agro-ecological and climatic conditions, and must acknowledge the pan-European nature (and cultural heritage) of vineyards.

Funding Scheme: Collaborative project (large-scale integrating project targeted to SMEs).

Additional eligibility criteria:

– SME-targeted Collaborative Projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 35 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: One project may be funded.

Expected impact: The project must lead to a better understanding of the links between improved agronomic management, production systems, grapevine varieties and quality of grape (aroma, flavour, pesticide residues…), leading to better grape and thus wine quality. The project will also deliver agronomic models to secure grape production under climate change conditions and enhance the link with breeding and genomics initiatives to capitalise on evolving tools. On a longer term, the impact of the project is to introduce innovations in the European viticulture sector to improve its competitiveness at the global level and secure jobs. An important role should be played in the project by vineyard cultivators and wine making SME's for whom improvement of raw grape quality will allow for higher grape prices and better wine processing.

KBBE.2012.1.2-05: Development of seed testing methods for pests and pathogens of plant health concern

Call: FP7-KBBE-2012-6 – single stage

Several plant diseases are spread or suspected to be spread by seeds. The extent of these diseases is variable within a bulk of seeds, therefore making it difficult to define a detection

threshold that can be used for testing seed lots. Validated seed testing methods have already been developed within the framework of ISTA (International Seed Testing Association) and ISHI (International Seed Health Initiative on vegetable crops, herbage and field crops). These methods though are developed for specific seed-borne fungi, viruses and bacteria affecting crop quality. There is a need for development and validation of more global, rapid, efficient and effective seed testing methods, to focus on seed-borne pests and pathogens of plant health concern (both quarantine and non-quarantine pests and pathogens). The project should address optimization of sampling aiming at increasing the likelihood of detecting pests in large seed lots in an economical practicable way; establish the seed transmission rate, where not known; develop proper detection and diagnostic methods in dry seeds; develop proper disinfection methods that do not affect germination rate and are realistic also for industrial processing. The project should tackle a wide range of pests and pathogens. The generated methodology should be built, when appropriate, on the pre-existing knowledge avoiding duplication with previous work, and delivering innovative and efficient tools.
Funding Scheme: Collaborative project (small or medium-scale focused research project).
Additional information: One project may be funded.
Expected impact: The project will generate knowledge and tools that can be used by National Plant Protection Services and Inspection Laboratories and by the seed industry, enabling detection of quarantine and other organisms of plant health concern. In addition it will provide disinfection methods that can be used to treat the infected batches of seeds. This project will provide scientific backing on the prevention of introduction and spreading of quarantine and harmful organisms within European Union and it is supporting the European Union Plant Health Policy.

KBBE.2012.1.2-06: Multipurpose trees and non-wood forest products for an innovative forestry in rural areas

Call: FP7-KBBE-2012-6 – single stage

Forests provide multiple goods (wood and non-wood) and services to rural communities. In this context, forest landowners, managers and policy-makers need new sylvicultural approaches, forest management models and tools and policies to create or consolidate the shift in forest management from the traditional wood production function towards more multi-stakeholders and multi-functional goals. Both the optimal management of multipurpose trees and the promotion of non-wood forest products could help achieve this shift and in general enhance the competitiveness of rural areas.
The project will follow a twofold approach:
On the one hand, research on multipurpose trees will generate new knowledge and tools (e.g. new silvicultural approaches, forest management practices, decision support systems, guidelines, etc.) to optimise the provision of multiple goods and services from these trees in rural areas. An integrated approach will be taken to address priority issues concerning the selected multipurpose tree(s), such as the sustainable management of forests/orchards, adaptation to climate change, protection from pests and pathogens, etc. The project will also explore and enhance the socio-economic contribution of these trees to rural areas.
On the other hand, the project will focus on new management practices needed to maximise the profitability of non-wood forest products (such as fruits, nuts, berries, mushrooms, cork, plants and herbs, etc.) and on the approaches required to ensure their commoditization and marketability from the perspective of consumers' behaviour and patterns, taking into account European as well as other markets. In addition, innovation approaches for creating new products and services in order to target emerging markets and new potential consumers and final users will be analysed, together with the crucial roles that various actors (e.g. land owners, potential users, local and sectoral public authorities, regional development agencies,

innovation support structures, etc.) play in supporting the development and implementation of new market offers.
Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).
Additional eligibility criteria:

- SME-targeted Collaborative Projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 25 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: One project may be funded.
Expected impact: Through research on both multipurpose trees and non-wood forest products, the project will in the long-term diversify the traditional wood-producing forestry and foster competitiveness and innovative socio-economic activities in rural communities. It will:
i) generate new knowledge and tools to optimise the provision of goods and services from multipurpose trees and develop strategies for their conservation and sustainable management.
ii) provide wider understanding on the potentials of markets for non-wood forest products, including the role of public and private actors in supporting the innovation processes for new products and services based on consumers' behaviour and patterns. SMEs will gain solutions for improving the management and profitability as well as the commoditization and marketing of non-wood products. Public and private actors in the innovation systems will receive an understanding of their important role in the innovation processes as well as guidelines and tools for systemic innovation support.

KBBE.2012.1.2-07: Development of management strategies for planted and managed forests to increase mitigation capacity

Call: FP7-KBBE-2012-6 – single stage

Forests play a key role in climate change mitigation. They store big amounts of carbon in their biomass and soil counteracting rising greenhouse gas concentrations in the atmosphere. On the other hand, when cleared, overused or degraded, they contribute significantly to global carbon emissions.
The project will develop optimal carbon sequestration measures and forest management strategies for climate change mitigation in different regions of Europe and will assess how they influence the carbon cycle and their mitigation potential. It will also analyse the impacts of these strategies and measures on other forest goods and services (e.g. biodiversity, water quality, flood prevention, soil protection, and recreation) as well as other socio-economic impacts. This will help balance climate change mitigation with other forest values.
Expected results will propose, among others, innovative measures, silvicultural techniques and forest management systems, including selection of tree species and tree species mixtures, to enhance carbon sequestration; analysis of the trade-offs with other forest functions; multi-criteria analysis and/or related decision-support systems.
Funding scheme: Collaborative Project (small or medium-scale focused research project).
Additional information: One project may be funded.
Expected impact: The project will develop mitigation strategies in forest management adapted to different European forests and taking into account side effects and trade-offs with other forests services. Results should support decision-makers and foresters. In the long term, the mitigation capacity of forests, including forest soil, will increase without harming other environmental, economic or social functions.

KBBE.2012.1.2-08: **Innovation in the forest-based sector for increasing resource efficiency and tackling climate change with competitive customer solutions - ERA-NET+** (*Topic jointly implemented by Themes FAFB and NMP)*

Call: FP7-ERANET-2012-RTD

The aim of this ERA-NET+ is to pool the necessary financial resources from the participating national (or regional) research programmes and the EU, to launch a joint transnational call for proposals for research, development and innovation in the forest sector. The objective is to support the transformation of European forest-based industry and sustainable forest management for increasing resource efficiency and adapting to and mitigating climate change effects. This will be achieved by integrating knowledge and technologies of large-scale industrial products and processes, as well as primary production. One possible strategic approach could be the substitution of non-renewable resources (e.g. materials and chemicals, in construction or as an energy source), by renewable forest-based solutions to reduce carbon emissions and waste. Strategic renewal in forest industry value chains also needs to consider change in raw material availability and composition due to anticipated impacts of environmental and climate change on forest resources. The joint transnational call will address the whole forest-based value chain, from the sustainable management of forest resources through their efficient utilisation in industrial processes to value added products and competitive customer solutions.

Thematic focusing of this joint transnational call should be commensurate with the funds available, so as to ensure a reasonable rate of success in the call. Details on the topics covered by the call will be decided by the participants in due time but shall be selected upon consultation with the Commission services concerned.

Funding scheme: Coordination and Support Action (coordinating action).

Eligibility and evaluation criteria: please refer to Annex 4 of the Cooperation Workprogramme including the Call Fiche "FP7-ERANET-2012-RTD".

Additional information:

- The topic is implemented jointly with Theme NMP (under topic identifier NMP.2012.4.0-3). It is identical to both themes. Hence each proposal must be submitted only once, either for topic KBBE.2012.1.2-08 or topic NMP.2012.4.0-3, but not both. Only one of the activity codes above should be used to submit application.
- One project may be funded.

Expected impact: (i) Improve coordination and reduce overlapping in key fields of research; (ii) achieve critical mass and ensure better use of limited resources in fields of mutual interests; (iii) share good practices in implementing research programmes; (iv) promote transnational collaborations and new knowledge generation and innovation; v) mobilise SMEs in the transnational projects to enhance innovation, in particular by allocating a significant share of total EU contribution to SMEs (20%, as indicative target).

KBBE.2012.1.2-09: Integrating the role of marine benthic ecosystems in fisheries management (The Ocean of Tomorrow)

Call: FP7-KBBE-2012-6 – single stage

The project will address the ecological significance of different types of marine benthic ecosystems, including essential and sensitive habitats, in European marine waters on a regional basis, and assess the impact of the fisheries on the status, structure, function and productivity of these ecosystems. The project will assess the degradation and loss of habitats caused by different bottom trawling fleets and the effects of bottom trawling on the marine benthic ecosystems and their habitats in terms of abundance of species and biodiversity (from fish to marine benthos macro-fauna and flora), on the nutrient recycling and on the benthic-pelagic coupling. The project will also support the development of monitoring process

towards Good Environmental Status (GES) under the Marine Strategy Framework Directive (MSFD) for relevant descriptors The project will have where relevant to build on knowledge and advice gathered under the Regional Sea Conventions and by the International Council for the Exploration of the Sea (ICES).

In addition to that, specific focus will have to be given on developing and testing innovative technologies and management tools, and on proposing and testing innovative and sustainable fisheries management plans for EU benthic and demersal fisheries in close cooperation with SME's (fishing industry). In this regard joint programming activities such as demonstration and trials at sea and the development of innovative technologies will have to be planned between the scientists and the fishing sector. Among other measures these innovative management tools and plans will have to consider discard-ban, total or partial fishing gear substitution (e.g. using long lines and/or, traps instead of bottom trawls; traps instead of dredges; - this list is not limitative) and avoidance or minimization of gears impact on marine benthic ecosystems. The effect of these management plans and mitigation measures will have to be assessed and in this regard specific focus will have to be given on the impacts of discard-ban and fishing gear substitution (in case of trawls coupled with changes in selectivity) on cost and earnings in the fishing industry (including related activities such as shipyards, gear manufactures, fish processing and marketing), on the fisheries and the fish stocks exploited. The effects of measures on marine ecosystems will have also to be assessed.

Funding Scheme: Collaborative project (large-scale integrating project targeted to SMEs).

Additional eligibility criteria:

- SME-targeted Collaborative Projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.
- With respect to the regional approach, the Baltic Sea, the North Sea, the Western Waters also called Western Approaches, the Mediterranean and Black Seas will have to be covered by specific case studies, each one addressing all the objectives of the topic. Proposals not fulfilling this criterion will not be funded.
- Duration: minimum 4 years.

Additional information:

- One project may be funded.
- The project should involve relevant SME's (from fishing industry) partners to develop mitigation measures and assess their impacts by carrying out trials and demonstration at sea in jointly programmed actions.
- The project should use available information (including historical data sets) from previous and on-going research surveys-at-sea and in particular those covered by the EU Data Collection Framework[13, 14].

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[13] Council Regulation (EC) No 199/2008 of 25 February 2008 concerning the establishment of a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy - OJ L 60, 5.3.2008, p. 1.

[14] Commission Decision 2008/949/EC of 6 November 2008 adopting a multiannual Community programme pursuant to Council Regulation (EC) No 199/2008 establishing a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the common fisheries policy - OJ L 346 of 23.12.2008, p.37.

– The project will have to liaise with other relevant national and international research initiatives.

Expected impact: The project will further increase scientific knowledge on the role and functioning of marine benthic ecosystems, contribute to develop "green" technology (e.g. new selective fishing gears preserving seafloor integrity and mitigating discards) and provide new tools and models to assess and manage the impacts of fishing on the marine benthic ecosystems. This project, in particular its regional dimension and multi-disciplinary (biology, ecology, economy, fish and fisheries technologies) approach, will require critical mass and will need to be carried out at EU level. It will support the Reform of the CFP (Common Fisheries Policy) and the implementation of the MSFD (Marine Strategy Framework Directive). Given the shared interest and the scale on which these policies arise, such research activities will be more effectively carried out at EU level.

KBBE.2012.1.2-10: Prevention of important diseases of farmed fish species

Call: FP7-KBBE-2012-6 – single stage

Fish diseases, notably those due to viral or bacterial infections, constitute one of the major obstacles in the sustainable development of European aquaculture mainly because of lack of sufficient knowledge base and of veterinary medicinal products authorised for use for the different fish species cultured in Europe.

It will be one of the main priorities of this project to contribute in developing and/or improving vaccines, vaccination methods and strategies for some of the main European farmed fish species. To achieve this objective it will be necessary to rely on existing and/or new knowledge on fish immunology. The project will implement a multidisciplinary approach ranging from the study of host-pathogen interactions at a molecular level for understanding the mechanisms involved in protective immunity, to the development and improvement of vaccination strategies for use under aquaculture conditions. To this end, the project by implementing cutting edge technologies will focus on the improvement of existing (but not sufficient) vaccines, as well as on the development of new prototype vaccines, with particular focus on antigen components, adjuvants and optimal delivery strategies.

Based on existing knowledge and (when possible) in synergy with relevant on-going national and international (public and private) research initiatives, the project will focus on the determination of the essential elements of the fish immune system to be activated by the vaccine. It will identify new vaccine antigen candidates along with designing of efficient adjuvants, in order to develop vaccines against pathogens, for which existing vaccines might have failed. The project will also explore optimal activation of immune mechanisms (including mucosal) in order to promote technically easy routes of administration, such as vaccine delivery by immersion and through the oral dosage. The project will also develop assays for monitoring and validating the response to vaccination for estimating the level of protection and designing/optimising vaccination/booster strategies under farming conditions. It will also consider potential side effects of vaccines on the fish, as well as, on final product's quality and safety. The project will implement a balanced effort on the following species: Atlantic salmon (*Salmo salar*), rainbow trout (*Oncorhynchus mykiss*), common carp (*Cyprinus carpio*), sea bass (*Dicentrarchus labrax*), sea bream (*Sparus aurata*) and turbot (*Scophthalmus maximus*). Consultation with competent authorities (in particular those in charge of authorisation of veterinary medicines), will be required for determining the relevance of the diseases (and vaccines) to be considered. The relevance of the diseases addressed in the proposals will be thoroughly assessed and evaluated on the basis of their demonstrated or potential socioeconomic importance for the fish farming sector considered, of the absence of availability of satisfying alternative prevention/mitigation solutions, and of the existing national and EU legal frameworks.

Funding Scheme: Collaborative project (large-scale integrating project targeted to SMEs).
Additional eligibility criteria:
- SME-targeted Collaborative Projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.
- Duration: minimum 4 years.

Additional information:
- One project may be funded.
- The project should also include a training component.

Expected impact: The results of this project will boost the development of new and efficient vaccines for the species listed. New and improved vaccines/vaccination strategies will reduce production losses and improve animal health, while increasing the competitiveness of the production sector concerned. The outcomes of the project should also contribute in reducing environmental impact of veterinary treatments in terms of reduced release of antibiotics and other compromising components generally used in therapy and disinfection. The project should stimulate the involvement of the private sector and pharmaceutical companies in particular in engaging into the development and marketing authorisation of new vaccines for European farmed fish. It should also contribute in building research capacity in this field throughout the EU.

KBBE.2012.1.2-11: Bridging the gap between science and producers to support the European marine mollusc production sector

Call: FP7-KBBE-2012-6 – single stage

The European shellfish production sector has been facing several important technical and production challenges during the last years. In particular, the oyster production segment is facing large scale mortalities that affect spat and juvenile Pacific cupped oysters. Other shellfish species like mussels and clams face similar or specific challenges. Science and innovation can play a significant role not only in finding solutions in current critical problems but also in anticipating future challenges and support the sustainable development of the production sector.
The project will review relevant ongoing research projects and existing scientific knowledge, including grey literature and empirical knowledge, related to the main challenges faced by the shellfish sector, with the aim to make this information and knowledge accessible to the shellfish farmers and enhance its integration into the production cycle of the main farmed species in Europe (oysters, mussels, clams etc). It will also stimulate the efficient dissemination of relevant results from on-going national and international research projects in the field of molluscs' research towards the production sector and other potential end users. The project will also address the structural difficulties of the shellfish farming industry to be actively involved in regional, national and EU funded research projects and will stimulate long term and efficient dialogue between scientists, producers and other stakeholders having an interest in shellfish farming. Ultimately, the project will contribute in identifying and prioritising gaps and needs for research in support to the mollusc production sector, while assessing the opportunity for the "shellfish community" to liaise/integrate the European Aquaculture and Innovation Platform (EATIP).
Funding Scheme: Coordination and Support Action (coordinating action).
Additional eligibility criteria:

- SME-targeted projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 25 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.
- Duration: 1 year.

Additional information: One project may be funded.

A strong participation of the private sector and its representatives is required, including for the coordination of the project.

Expected impact: The project should contribute in increasing exchanges between the scientific community and the shellfish production sector, as well as, in increasing participation of the European shellfish production sector in the determination of research priorities. It will contribute in ensuring that results from national and EU funded research projects are appropriately disseminated and actually used by potential end users. It will strengthen the link between the scientific community and the production sector and should facilitate the participation of the shellfish industry (and relevant SMEs in particular) in research activities and projects.

KBBE.2012.1.2-12: Providing molecular tools for assessing and monitoring the potential genetic impact of aquaculture on native populations (The Ocean of Tomorrow)

Call: FP7-KBBE-2012-6 – single stage

The ongoing domestication process of cultured aquatic species introduces a potential risk of genetic impacts from aquaculture (including in the context of restocking practices) on wild populations. Interaction between farmed and wild aquatic animals may induce effects that depend on several factors including genetic diversity, local adaptation, behaviour and relative abundance of farmed and wild counterparts. Although, up to date experimental evidence of effects of interbreeding between wild and farmed individuals on genetic structure, fitness and productivity of wild populations is limited, based on the precautionary approach potential risks and adequate assessment tools need to be anticipated.

One of the main objectives of the project will be to draw the baseline demographic and genetic information (including through collection and analysis of historical samples) on relevant life-history traits and structuring of wild populations (connectivity, local adaptive variation etc) and farmed stocks (broodstock origin, inbreeding levels etc) of some European farmed fish species, to assess and monitor the potential genetic interaction between farmed and wild fish in relation to potential risk and current practices. The project will develop reliable and cost effective molecular tools for the identification of the genetic origin of farmed fish (assignment and genetic traceability), as well as for the detection of interbreeding and assessment of potential genetic introgression of farmed into wild stocks. This work will be carried out on sea bass (*Dicentrarchus labrax*), sea bream (*Sparus aurata*) and possibly also on turbot (*Scophthalmus maximus*).

The project will also explore the link between genetic differences among wild and farmed stocks and phenotypic differences in key life history traits and examine differences in functional adaptations between wild and cultured conditions. It will implement common garden studies with appropriate material from wild and farmed origin to evaluate potential effects of introgression on fitness (nutritional state, reproductive capability etc) of wild populations. This work will be carried out on Atlantic salmon (*Salmo salar*) and brown trout (*Salmo trutta*), including in a restocking context.

The project will liaise with relevant ongoing research initiatives (national, EU and international), exploit existing databases, genomic resources and tools and perform the necessary standardisation to allow comparative studies. Collaboration with the fisheries and

aquaculture production sectors (hatcheries and companies/institutions involved in breeding programmes in particular) may be required to obtain significant representation of genetic variation within wild and farmed stocks. A balanced effort between the species listed is required.

Funding Scheme: Collaborative project (small or medium-scale focused research project targeted to SMEs).

Additional eligibility criteria:

– SME-targeted Collaborative Projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: One project may be funded.

Expected impact: Sound knowledge on the biological importance and ecological consequences of potential genetic introgression and on the plasticity of the genetic diversity of wild populations will contribute to the assessment of the potential genetic impact of farmed on wild fish. The tools developed by the project will ensure the monitoring and mitigation of potential genetic impact of farmed fish on wild populations. They might also contribute in the monitoring of progress towards Good Environmental Status (GES) for descriptors 1 and 2 which will be needed for the implementation of the Marine Strategy Framework Directive (MSFD). These tools might also contribute in ensuring better traceability of seafood products over the production chain. Project's results might be relevant in the frame of on-going and future breeding programmes. They might also be appropriate for assessing consequences of restocking practices.

KBBE.2012.1.2-13: Strengthening cooperation in European research on sustainable exploitation of marine resources in the seafood chains - ERANET

Call: FP7-ERANET-2012-RTD

The overall objective of this topic is to further strengthen cooperation and synergy between major European national funders that support research on sustainable exploitation of marine resources in the seafood chain. The project should build on results achieved by the fisheries MARIFISH FP6 ERANET. It should address sustainability in the entire seafood chain from catches and production to end products including fisheries, aquaculture, seafood processing and distribution to the consumer. The project will also consider research which is necessary to provide advice on how ocean and seashore space might be shared without detriment between the different users.

The project will facilitate better cooperation, synergy and efficiency between research funders in Member States and Associated Countries through the launching of joint research initiatives e.g. joint calls, shared research programmes, foresight studies. It will develop a public, "real-time" database on national and regional research programmes and projects in the relevant fields and will stimulate complementarities and synergies between national and EU funded projects and programmes, including international cooperation, through concrete actions including data sharing, twinning activities, common workshops, shared training activities etc. It will also link with relevant European and national Technology Platforms and with stakeholders groups including Advisory Committees, NGOs to ensure complementarities between national and private research initiatives while ensuring that socio-economic aspects are well taken into account.

Strong links will be created with the existing FP7 overarching SEASERA ERANET which aims at embracing the whole spectrum of marine and maritime research. This new ERANET should also support any envisaged Commission Recommendation on the Joint Programming

Initiative that would address the 'Healthy and Productive Seas and Oceans', which mirrors the objectives of the EU Strategy for Marine and Maritime Research (COM(2008) 534) with the ambition to bring the marine ERA to a higher level of integration.
Funding Scheme: Coordination and Support Action (coordinating action).
Eligibility and evaluation criteria: please refer to Annex 4 of the Cooperation Workprogramme including the Call Fiche "FP7-ERANET-2012-RTD".
Additional information: One project may be funded.
Expected impact: The project will address EU grand challenges on seafood security, safety and sustainable use of marine resources in the seafood chains in a more coherent and coordinated way. It is expected that the project will contribute in meeting the increasing EU demand for fish and seafood while moving towards an ecosystem based approach.

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

Optimised animal health, production and welfare, across agriculture, fisheries and aquaculture, inter alia *through the exploitation of genetic knowledge, new breeding methods, improved understanding of animal physiology and behaviour and the better understanding and control of pests, parasites and infectious animal diseases and other threats to the sustainability and security of food production, including zoonoses. The latter will also be addressed by developing tools for monitoring, prevention and control, by underpinning and applied research on vaccines and diagnostics, studying the ecology of known or emerging infectious agents and other threats, including malicious acts, and impacts of different farming systems and climate. New knowledge for the safe disposal of animal waste and improved management of by-products will also be developed.*

KBBE.2012.1.3-01: Development and evaluation of scientific methodologies for cost-effective risk-based animal health surveillance

Call: FP7-KBBE-2012-6 – single stage

Changes which are rapidly occurring at global level are favouring the emergence and re-emergence of diseases some of which are zoonotic: increasing demand for animal protein is putting pressure on the expansion of livestock production in particular in Asia, Africa and South America; changes in the international markets for animal and animal products; increased international trade and movement of people; climate change resulting in different agricultural production patterns and in the spread of vector-borne diseases; closer contact of livestock with wildlife in new production areas and as a consequence of deforestation etc. All these changes increase the risk of emergence, introduction and spread of diseases in the EU. In this rapidly evolving and challenging context, surveillance systems are key elements for early pathogen detection and accurate risk estimation to underpin the development of response policies. Recent scientific advances in the development of qualitative and quantitative epidemiological methods and laboratory diagnostic tools need to be integrated as part of cost-effective and state-of-the-art surveillance systems. The objective of this research is to develop and evaluate scientific methodologies that will assist relevant authorities in designing evidence-based and cost-effective risk-based surveillance programmes using state-of-the art qualitative and quantitative epidemiological methods. Different surveillance objectives associated with major epidemic and endemic infectious diseases will be considered including methodologies aiming at providing evidence of freedom of disease or infection. The cost-effectiveness of the newly developed and the traditional surveillance methodologies will be compared and their advantages and disadvantages considered.
Funding Scheme: Collaborative project (small or medium-scale focused research project targeted to SMEs).

Additional eligibility criteria:

– SME-targeted Collaborative Projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information:

– One project may be funded.

– The project should contain a portfolio of training activities.

Expected impact: Support of the Community Animal Health Policy (CAHP) and international policies. Support European Food Security Authority (EFSA) activities and relevant authorities in the decision making process. Cost-effective risk-based surveillance programmes. Earlier detection of diseases will allow taking rapid response and hence reducing losses in production and market access for farmers and compensation funds for public bodies. Inform appropriate biosecurity measures for different production systems. Contribute to assess potential changes in the production systems. Methodologies can be applicable to other areas of the world.

KBBE.2012.1.3-02: Targeted research effort on African swine fever

Call: FP7-KBBE-2012-6 – single stage

African swine fever is a devastating disease of pigs which is currently spreading throughout Africa, the Caucasian region and Russia. The EU is at high risk of introduction of the disease by legal or illegal movements of animals and animal products, particularly through its Eastern borders. Research efforts at European level should continue to provide the science for preparedness programmes in this evolving situation. Different aspects should be targeted to generate knowledge a) for the design of different prevention, control and eradication models according to the different epidemiological scenarios (with and without ticks, unaffected wildlife, tolerant wildlife, backyard production systems etc..) ; b) on the interaction between domestic pig and wild boar -with and without presence of ticks-and on the role of European wild boar in transmission and its risk factors ; c) for the development of protection tools compatible with environment and food safety. In addition the project should contain a portfolio of training and technology transfer activities.

Funding Scheme: Collaborative project (large-scale integrating project targeted to SMEs).

Additional eligibility criteria:

– SME-targeted Collaborative Projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: One project may be funded.

Expected impact: Advancement of knowledge with contribution to improving the quality of EU research. Generation of tools and strategies for the prevention and control of African Swine Fever. Training of EU and third countries researchers. Contribute to the competiveness of European pig production and international trade. Support for Community Animal Health Policy, contribution to international policies, MDGs and food security. European added value in different aspects e.g. critical mass of researchers and activities internationally recognised and addressing a pan-European challenge.

KBBE.2012.1.3-03: Monogastrics Feed Efficiency - Efficiency of terrestrial livestock digestive systems and reduction of the ecological footprint through a combination of systems biology, 'omics' and nutrition

Call: FP7-KBBE-2012-6 – single stage

There is pressure to improve the efficiency and welfare in animal production while reducing the environmental footprint of the sector and against a backdrop of increasing global demand for animal products. A key element of Europe 2020 is the reduction of greenhouse gas emissions, and phosphorus pollution is a serious concern.

The gut is responsible for the efficient digestion and absorption of feed and nutrients, however the biochemical and microbial processes in the gut and the excreta also result in the production of greenhouse gases, or excretion of phosphates and nitrates. Both the microbial flora of the gut and feeding regime exert a profound influence on digestive efficiency and greenhouse gas production. Increased understanding of the biology of the monogastric gut and excreta in terrestrial animals will offer new approaches to improve nutrient utilization, feed efficiency whilst simultaneously reducing greenhouse gas emission.

The proposed project will bring together systems biology, microbiology and genetics of both host and microflora, and where appropriate metagenomics to better understand the network of interactions between gut microflora, feed regime, and the host genome. The project will determine how these interactions influence nutrient utilization, feed efficiency, greenhouse gas production, and product quality. The project will target at least pigs and poultry. The interactions with animal behaviour, health and welfare should also be taken into consideration.

Funding Scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

Additional eligibility criteria:

– SME-targeted Collaborative Projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: One project may be funded.

Expected impact: The expected outcomes of this research are improved understanding of the variation in the monogastric digestive system, new systems models and tools applicable to selective breeding and nutrition for improved gut health and functionality, reduced greenhouse gas emission and improved product quality. This is a multi-disciplinary project which will improve collaboration between different disciplines of animal production.

KBBE.2012.1.3-04: Optimised terrestrial farm animal reproduction systems and/or technologies

Call: FP7-KBBE-2012-6 – single stage

Achieving good reproductive performance is an essential component of any efficient system of farm animal breeding. Decreased fertility and longevity is an increasing problem in certain systems of terrestrial animal production. Fertility is the principal factor determining lifetime productive efficiency and survival of individuals, and also the health and welfare status of farm animals. Good fertility and optimal reproductive performance are key elements in improving resource efficiency and reducing overall environmental impacts.

This multidisciplinary topic focuses on developing systems, processes and/or technologies to improve reproductive efficiency in terrestrial farm animals in a balanced and sustainable manner. The approach may target production systems ranging from intensive to extensive, including organic farming. Domains for investigation could include genetics, physiological or

management aspects of reproduction, including novel trait measurements and trait ontology, as well as advanced techniques.

Funding scheme: Collaborative Project (small or medium-scale focused research project targeted to SMEs).

Additional eligibility criteria:

– SME-targeted Collaborative Projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: Up to two projects may be funded.

Expected impact: Better understanding of the mechanisms in the animal that influence reproduction characteristics. Use of reproductive strategies for the sake of efficient, well balanced and sustainable livestock production. Innovative systems and technologies. Sustainable and efficient production and management of biological resources.

Area 2.1.4 Socio-economic research and support to policies

Providing the tools needed by policy makers and other actors to support the implementation of relevant strategies, policies and legislation and in particular to support the building of the European Knowledge Based Bio-Economy (KBBE) and the needs of rural and coastal development. The Common Fisheries Policy and the new European Maritime Policy will be supported through a whole ecosystem approach for the harvesting and the farming of marine resources. Research for all policies, including the Common Agricultural Policy, will include socio-economic studies and cost-benefit analysis, comparative investigations of different farming systems including multifunctional ones, cost-effective fisheries management systems, the rearing of non-food animals, interactions with forestry and studies to improve rural and coastal livelihoods.

KBBE.2012.1.4-01: Design of a systems analysis tools framework for the EU bio-based economy strategy

Call: FP7-KBBE-2012-6 – single stage

The relationships between the bio-economy sectors and with the rest of the economy within the European Union, the definition of the European strategy and the evaluation of its future impacts and long term evolution as well as its monitoring need the development of a systems analysis tools framework ; such a system would include data basis, indicators, models which would be used to proceed to forward looking analysis addressing forecast, foresight, impact assessment, evaluation of technologies; both quantitative and qualitative analysis would be considered.

This supporting action is limited to an exploratory / operational phase providing first results, and aiming at the elaboration of the concept and the design of such a systems analysis framework; it will identify (i) the data basis and indicators to be part of the framework, mainly related to the social, economic, environment and technology aspects (ii) the models to be considered, both macro-meso-economic and sectoral (agriculture, energy-environment…) models. These tools, preferably existing at this stage (or tools already under development) will be specified, as well as their accessibility; the necessary softwares for the access to these tools will be designed whereas new informatic developments for the interfaces between these tools will be specified.

The scope of the framework will cover EU countries with possibility of regional representation; land use, ecosystems and geographical dimensions should be also part of the framework if their size is relevant for the type of analysis to be done and compatible with the

whole size of the framework. Large regions and countries of the world will have to be taken into account. The introduction of the tools under development within Framework Programmes (e.g. from Theme Food, Agriculture and Fisheries, and Biotechnologies – the bio-based economy) into the framework analysis would have to be envisaged when appropriate.
Funding scheme: Coordination and Support Action (supporting action)
Additional information: One project may be funded.
Expected impact: The proposed framework analysis would make possible during the next EU framework programme strategic analysis in terms of forward looking, impact assessment of policies and measures, monitoring research and innovation activities to support policies. It would help to start already in 2013 the development or adaptation of models and indicators, as well as data collection and elaboration of scenarios relative to the bio-based economy.

KBBE.2012.1.4-02: Boosting the translation of FP projects' results into innovative applications in the field of agriculture, forestry, fisheries and aquaculture.

Call: FP7-KBBE-2012-6 – single stage

The main aim of this topic is to allow building on results from projects funded under EU Framework Programmes (FP5, FP6, FP7) in the field of agriculture, forestry, fisheries and aquaculture, to prove the technical and economic viability of methodologies, processes, prototypes, models, technologies etc. -developed under these projects- that offer a potential economic interest but which cannot be commercialised directly. Eligible RTD and demonstration activities under this topic will focus on specifications, testing and validation of existing results of FP programmes for reaching the last development stage before products or processes enter the production and/or the market. Proposals must fit into the overall business and innovation needs of the SMEs involved and must demonstrate clear exploitation potential and economic benefits for them. Applicants must be owners of the IPR of the results and knowledge to be used in their application and the proposals must clearly and convincingly describe how this knowledge/technology will be brought forward enough to reach the stage of innovative application.
Funding scheme: Collaborative Project (small or medium-scale focused research project targeted to SMEs).
Additional eligibility criteria:
- SME-targeted Collaborative Projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 75 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.
- Maximum duration 2 years.

Additional information: Up to three projects may be funded.
Expected impact: This topic is expected to contribute in tackling the paradox of EU research, i.e. being world leader in producing high level scientific knowledge but underperforming in terms of translation into applications and innovative products and services. Considering the specificities of the economic sectors falling under this activity of the KBBE, this topic is expected to contribute in paving the way from the development of scientific knowledge and technologies to the market by stimulating the development of new patents, dedicated business plans and innovative marketable applications.

KBBE.2012.1.4-03: Advocacy and informational material for different media targeting decision makers at different levels and end-users in Africa in the fight against neglected zoonotic diseases

Call: FP7-KBBE-2012-6 – single stage

Neglected zoonotic diseases (NZD) are endemic in most developing countries affecting livelihood of the poorest populations. Addressing the socio-economic, cultural and anthropological aspects are crucial in the fight against these diseases. In this regard the change in behaviour patterns of populations affected which contribute to the maintenance of these diseases needs to be tackled. Communities led initiatives have proven very fruitful in tackling diseases. In addition decision makers involved in animal and public health issues need to be involved for the support and sustainability of the initiatives and to transplant them to other areas. The project will generate educational material targeted to livestock owners, decision makers and media. It will involve a comprehensive multidisciplinary approach including sociology, economics, anthropology, gender science and traditional knowledge and environmental sciences. It will foresee the organization of an international conference.

Funding scheme: Coordination and Support Action (supporting action).

Additional eligibility criteria:

– SME-targeted projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 25 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: One project may be funded.

Expected impact: Reduce prevalence of NZDs in a structural and sustainable way. Improve livelihood of affected populations by raising animal production and improving public health. MDGs. Continue commitment of the EU in NZDs. In line with "One health". Development of models applicable to other parts of the world including in some European areas, Asia and Latin America.

KBBE.2012.1.4-04: Improved management practices and alternative treatments to improve animal health in organic farming systems

Call: FP7-KBBE-2012-6 – single stage

Livestock is an important part of organic farming systems, and it is an explicit goal of organic farming to ensure high levels of animal health through proactive management of breeding, feeding, housing, adequate care, and treatment of diseases. However, many herds/flocks face multi-factorial syndromes, which present major challenges to organic livestock management but also regarding the expectations of consumers and the credibility of organic production.

Thus, strategies for handling diseases appropriately and successfully are urgently needed and could be developed by a combination of learning from existing diversity of organic livestock production systems and testing new innovative forms of prevention and control that support the animal's natural ability to cope with diseases.

In addition, there is still a considerable need to reduce the input of chemical allopathic treatments in European organic livestock production systems. Neither chemical allopathic nor alternative medicinal treatments have shown a high effectiveness to resolve multi-factorial syndromes. In contrast, an integrated system approach, using adapted protocols and well monitored strategies to prevent and control the prevalence of multi-factorial syndromes is expected to be more appropriate to react on the farm specific health environment.

The aim of this topic is to develop innovative approaches to enhance animal health in different organic livestock farming systems across Europe by determining the most effective strategies to prevent and control multi-factorial syndromes at an early (sub-clinical) stage. Such strategies will be integrated at farm level into health planning programmes and will serve to validate on site the identified risk factors. The ultimate goal will be to allow farmers to implement these strategies to achieve an optimal animal health status on their own farm.

The project will explore the disease patterns and health situation in one or several livestock species with major economical impact. The project will address at least multi-factorial syndromes in dairy cattle. It will:

- Combine a number of methodological approaches including the development of appropriate tools for characterising the health status profile of farms
- Identify and validate related variables and specific risk factors in order to implement appropriate measures to achieve an optimal health status,
- Test new farming techniques associated or not with the use of alternative medicinal treatments in well defined and managed organic farming systems

In addition a cost-benefit assessment of the developed practices should be performed.
The involvement of stakeholder groups such as farmers' organisation and farm advisory systems in dissemination activities is essential to successful uptake the project results.
Funding Scheme: Collaborative project (small and medium-scale focused research project).
Additional information: One project may be funded.
Expected impact: The project will contribute to advance the knowledge and develop innovative approaches towards animal health in organic livestock systems. It is expected to have economic benefits in reducing sanitary problems at farm level and help to increase productivity. It will help also to reduce the use of chemical allopathic treatments of diseases and potential impacts of residues on human health and the environment. It will support policy development of the organic farming regulation. It is expected that the impact of the project goes beyond organic farming systems and be relevant to other livestock production systems (low-input, conventional farming systems).

KBBE.2012.1.4-05: Volatility of agricultural commodity markets

Call: FP7-KBBE-2012-6 – single stage

Price volatility remains on the international agenda. Volatility of agricultural and food prices and its implications for producers, consumers and food security continue to be discussed following price changes of 2007 – 2008, and more recently in 2011. Commodity price volatility has been analysed using rather simple statistical and econometric tests. Additional tools are needed to deepen the analysis, especially on the linkages between financial and physical markets. A variety of methods can also be borrowed from financial economics. Moreover, new, multidisciplinary theories (possible going past perfect competition and broadening to new areas) and approaches are needed. This includes better linkages between financial, economic and geo-physical models (e.g. impact of climate change on production and yields).
The project calls for state-of-the art literature review of methods and results of price volatility, advancing methods to study price volatility including an in-depth study of price volatility on various markets in various stages along the food chain using advanced statistical and econometrical methods for different agricultural commodities as well as quantitative assessment of volatility on agricultural and food markets, its causes (including yields) and its impacts. Price volatility will be studied for both financial and physical markets, including their linkages. Different agricultural commodities some agricultural inputs and relevant non-agricultural commodities should be covered with different data frequences and with a preference for more frequent (daily). Both international benchmark prices as well as more local markets, including the EU and selected developing country markets should be covered.
The project should study (and quantify when possible) the causes of changes in agricultural commodity price volatility, such as on the supply and demand sides seeking reasons for changes in supply and demand going beyond seasonal factors, and exploring the share of price changes explainable by changes in fundamentals. This implies incorporating linkages between economic models and geo-physical models (e.g. impact of climate change on yields).

Linkages with and transmission from other commodities with have a connection with agriculture, macroeconomic linkages: e.g., impact of exchange rates, interface between financial and physical markets and the role of policies should be considered. Food, feed and non-food uses should be considered. The impact of volatility on farmers and users along the food chain, including a focus on the most vulnerable in Europe and in developing countries should also be considered.
Funding Scheme: Collaborative project (small or medium-scale focused research project).
Additional information: One project may be funded.
Expected Impact: The project would contribute to a better understanding of market dynamics and discussion of risk management policy tools in the Common Agricultural Policy (CAP) post 2020 debate. It will also contribute to informing discussions and policy recommendation in international forums dealing with price volatility and development of new policy tools. It will have implications for different EU policies in agriculture, common market, enterprise, development and trade.

KBBE.2012.1.4-06: Short chain delivery of food for urban-peri-urban areas
Call: FP7-KBBE-2012-6 – single stage
The rapid urban growth no longer supports the traditional divide between 'urban' and 'rural'. In Europe, a significant share of agricultural activities take place in highly urbanised settings, producing food and public goods (such as recreation, landscape management) and confronted with particular pressures on land resources as well as opportunities. There is a growing trend in the urban population to consume fresh and local products, demand short chain food delivery and to request more transparency on the origin of the products. Citizens are increasingly calling for the creation of a regional urban-focused food system and for support to small farmers in rural peri-urban areas, in order to increase availability and accessibility to food. Moreover, both technological and social innovation in urban peri-urban agriculture can play an important role in mitigating climate change, closing nutrient cycles and prepare effective tools for adaptation and building more resilient urban areas.
In developing countries, there has been a growing recognition of the significance of urban and peri-urban agriculture (UPA) for poor people's livelihood, contributing to food security and poverty alleviation. However, negative impacts of UPA include the potential over-use of pesticides and human exposure to contaminants and pathogens associated with UPA conflict in use of natural resources, land and water, between agriculture, industry and urban development.
The project will provide technical and institutional insights for sustainable development pathways of peri-urban food supply chains in different EU countries, and, if relevant, also in developing countries. Special attention shall be paid to identifying sustainable solutions for water management and nutrient recycling while keeping the local food supply chains safe for the consumer. For this purpose, innovative concepts in different farming systems (conventional, low-input, organic production) shall be studied.
The role of social innovation and institutional interaction is an important issue to consider in terms of governance processes towards sustainable decision making of land-use in peri-urban areas. The role of the CAP and rural development as an instrument to reach sustainability objectives has also to be assessed for EU countries. Similarly, the relation between peri-urban pressures and the participation of farmers and other stakeholders in rural development measures shall be considered. Technical, economic, and social aspects, including logistical aspects, of the establishment of short chain delivery in peri-urban areas should be studied with the help of a range of case-studies, and best practices. The involvement of SMEs in the process is essential.

Funding Scheme: Collaborative project (small or medium-scale focused research project targeted to SMEs).
Additional eligibility criteria:
– SME-targeted Collaborative Projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.
Additional information: Up to two projects may be funded.
Expected impact: The topic is expected to generate new knowledge on the development of peri-urban areas and to provide safe and healthy food to the benefit of consumers together with more transparency in the delivery process. It is expected to generate innovative approaches involving SMEs to short chain food supply together with multi-functional approach to peri-urban agriculture in EU countries and possibly in developing countries. It is expected to contribute to the development of rural-urban policy.

KBBE.2012.1.4-07: Agricultural Knowledge and Innovation Systems for an inclusive Europe

Call: FP7-KBBE-2012-6 – single stage

Extension services have been reformed in recent years in a number of EU Member States (partly under the pressure of decreasing public resources and changes in the thinking about the roles of the various players) but the needs for this kind of services are still very high (e.g. increasing regulatory constraints such as environment, safety, standards etc). In some of the countries of the European Union, there is also a large layer of semi-subsistence farms and small commercial farms, which are not sufficiently involved in knowledge exchanges.
A complete picture of the EU-27 is needed on the research – extension – farmers knowledge flows in both directions. The basis of this picture should be a comprehensive inventory of the actors in the field: basic and applied agricultural research institutes and universities, advisory and extension services, and other actors influencing research priorities and practical decision making on farms, e.g. co-operations, supply services, farmers` organisations and groups, etc. The formal and informal interactions between all these actors in the different Member States should be described. A typology of knowledge flow systems should be elaborated. Surveys will support the description of knowledge flows and will help to reveal how research and farming practice are linked, how the scientific community is informed about research needs and how the spread of technological and social innovation can be promoted.
Which systems are part of the official Farm Advisory System of the Common Agricultural Policy and which other public and private advisory services are operational in the field? Information is needed on farmers access to these services, including possible constraints for uptake of advice (e.g. price, trust etc.) and whether what is delivered meets their challenges. Is there a need for knowledge outside classical agricultural disciplines and how is it mobilised? Which forums could improve coordination, which could be good incentives to reconnect farm practice and research, to encourage uptake of advice, to valorise flows from advisors to research and vice versa, and to push application of innovative practices and techniques?
The project would extend and deepen the work undertaken in the framework of the Agriculture Knowledge and Innovation Systems (AKIS) collaborative working group in the Standing Committee on Agricultural Research (SCAR). It would be complementary to ongoing projects like SOLINSA and build on previous projects like EU-AgriMapping or Insight.
Funding Scheme: Coordination and Support Action (supporting action).
Additional information: One project may be funded.

Expected impact: The project will contribute to build a European agricultural innovation system and lead to better informed policy decisions on how to improve the functioning of the different components on European, national and regional level.

KBBE.2012.1.4-08: Development and application of methodologies and tools, including indicators, for the assessment of environmental impacts of rural development programmes in the EU

Call: FP7-KBBE-2012-6 – single stage

Council Regulation (EC) No 1698/2005[15] on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) provides the legal framework for the preparation and implementation of rural development programmes in the Member States for the period 2007-2013. The regulation establishes the overall objectives, strategic approach and specific priorities for the EU rural development policy for the period 2007-2013.

The regulation acknowledges the importance of evaluating the socio-economic and environmental impacts of the rural development programmes to ensure accountability and to allow for improvements to be made in terms of the design and targeting of the support. The Common Monitoring and Evaluation Framework (CMEF) for rural development policy provides a solid foundation in this respect and progress has been achieved over the last years in developing appropriate evaluation methodologies and tools.

However, the evaluation of environmental impacts is especially challenging and Member States have reported difficulties in identifying the impacts attributable to specific rural development measures in the context of multiple intervening factors. Moreover, environmental impacts are strongly influenced by site-specific circumstances, and they may take a long time to emerge.

In this context, the objective of the research project should be the development of new and improved evaluation methodologies and tools in order to:

- Assess the environmental impacts of rural development programmes against their counterfactual (i.e. calculating the changes that would have occurred without the specific programme intervention).
- Measure the micro and the macro level environmental effects of the programmes and to meaningfully integrate the results.
- Estimate the net environmental effects of rural development programmes by netting out deadweight, substitution and multiplier effects.

Funding Scheme: Collaborative project (small or medium-scale focused research project).

Additional information: One project may be funded.

Expected impact: The project will contribute to a better delivery of public goods through the Common Agricultural Policy. A better targeting of the measures will increase their cost-effective contribution to environmental objectives, like those linked to climate change mitigation, biodiversity and others.

KBBE.2012.1.4-09: International comparisons of product supply chains in the agro-food sectors: determinants of their competitiveness and performance on EU and international markets

Call: FP7-KBBE-2012-6 – single stage

The EU international trade in agri-food products plays a major role. In particular, the EU is a significant exporter of processed products with final products representing 68% it its exports in value in 2007-2009, intermediary products representing 23% and commodities only 9%.

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[15] OJ L 277 of 21.10.2005, p. 1.

The significance of these final products has regularly increased in the past years. At the same time the EU is a significant importer of agri-food products from third markets.
Assessments of the competitiveness on international markets are often limited to some segments of the product chains, e.g. comparison of competitiveness at the farm level, whereas the determinants of competitiveness of the agri-food industry go well beyond production cost comparisons: they include other elements of prices and costs (e.g. logistics, losses along the product supply chains, etc.) but also non-price competitiveness elements (strategies of firms, product differentiations, innovations, etc.). Given the important role of the EU and international markets for EU product chains, in particular for processed products, it is important to gain a more comprehensive view on the different elements which contribute to their competitiveness.
The project should cover the measurement of the components of the competitiveness of product chains on both the EU market and international markets for a selection of major products and relevant countries. It should provide and analysis of costs (including at agricultural level) along the product chains, including logistics and assessment of the significance of losses along the product supply chain. The analysis at farm level would include the evolutions of total factor productivity. Price/cost transmission along the product chain should be covered as well as other elements of the competitiveness (product differentiation, economies of scale, sourcing, etc.).
Funding scheme: Collaborative Project (small or medium-scale focused research project)
Additional information: One project may be funded.
Expected impact: An assessment of competitiveness of the European agro-food industry will allow better targeted and evidence based policies. A better assessment of the various costs along the food supply chain will provide a the information needed to develop better regulation further in line with the citizens expectations while keeping the competitiveness of the agro-food chain.

Activity 2.2 Fork to farm: Food (including seafood), health and well being

Area 2.2.1 Consumers

Understanding consumer behaviour and consumer preferences as a major factor in the competitiveness of the food industry and the impact of food on the health, and well-being of the European citizen. The focus will be on consumer perception and attitudes towards food including traditional food, understanding societal and cultural trends, and identifying determinants of food choice and consumer access to food. The research will include the development of data bases on food and nutrition research.

KBBE.2012.2.1-01: Role of health-related symbols and claims in consumer behaviour

Call: FP7-KBBE-2012-6 – single stage

The labelling of food products is intended to help consumers make an informed choice when buying food. The project will provide scientific evidence on how consumers understand health claims and health-related symbols, and how those claims and symbols contribute to healthier food choices at the point of purchase. Behavioural and cognitive science research should address the health-related information that the consumer wants, needs and understands on food labels, how best to present this information, and what behavioural consequences and changes health claims and health-related symbols may induce in purchasing and consumption patterns. Health-related information on labels should be considered, together with other labelling information on the food product itself, as well as other information made available to the consumer. The wording of health claims should be addressed with a view to avoiding possible misinterpretation on the part of the consumer, and to optimise the impact of such claims on healthier choices, taking into account country specificity.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

Additional information: One project may be funded.

Expected impact: Generation of knowledge of how to guide the consumers' behaviour towards healthy choices. Contribution to the EU policy related to food information and health claims leading to social innovation.

Area 2.2.2 Nutrition

Understanding beneficial and harmful dietary factors as well as the specific needs and habits of population groups as a major controllable factor in the development and reduction of occurrence of diet-related diseases and disorders including obesity and allergies. This will involve the investigation of new dietary strategies, the development and application of nutrigenomics and systems biology, and the study of the interactions between nutrition, physiological and psychological functions. It could lead to reformulation of processed foods, and development of novel foods and ingredients, dietetic foods and foods with nutritional and health claims. The investigation of traditional, local, and seasonal foods and diets will also be important to highlight the impact of certain foods and diets on health, and to develop integrated food guidance.

KBBE.2012.2.2-01: Beneficial effects of bioactive compounds in humans

Call: FP7-KBBE-2012-6 – single stage

The aim of this topic is to gain a better understanding of the role and mechanisms of bioactive compounds from dietary sources that may have a beneficial effect on human health. The availability and activity of bioactive compounds should be measured, together with their effect on physiologically relevant end-points. The research aims to increase scientific knowledge through the use of biomarkers that are relevant to humans. Therefore, appropriate

dietary intervention studies are needed to clearly demonstrate the effects of bioactive compounds. Where appropriate, gender issues should be considered.
Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).
Additional eligibility criteria:
– SME-targeted Collaborative Projects will only be selected for funding on condition that the estimated EU contribution going to SME(s) is 25 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.
Additional information: Up to two projects may be funded.
Expected impact: Better understanding of the potential benefits of bioactive compounds will lead to improved formulation of foods and better dietary recommendations for consumers. The expected project results should clearly be of interest and potential benefit to the European food industry and SMEs, and will increase their innovation potential and competitiveness. Involving SMEs in the project itself should help contribute to achieving that benefit. The project will contribute to underpinning health claims with appropriate scientific evidence, where relevant. It will support the implementation of European legislation on health and nutrition claims, and will enhance cooperation between scientific disciplines and stakeholders in Europe. Projects supported under this topic should lead to a greater integration of research actors and activities from across the European Union, and the candidate countries.

KBBE.2012.2.2-02: Study on the need for food and health research infrastructures
Call: FP7-KBBE-2012-6 – single stage
Health and nutrition research infrastructures are needed to strengthen high-quality research and to provide sound knowledge for public health nutrition strategies across Europe. The aim of the study is to identify existing infrastructures for food and health research, and to assess the need to integrate these and/or to create new infrastructures. Activities under the umbrella of such infrastructures should include experimentation, observation and monitoring, data processing and modelling, conservation and distribution, and finally, knowledge transfer. High-quality infrastructures should encompass disciplines that contribute to the understanding of mechanisms underlying the development of diet-related diseases, and contribute to improving public health preventive strategies in the longer term. Improving, standardising and harmonising research methods and data collection as well as developing new technology would be at the core of research activities in such infrastructures. The project should address all aspects related to the technical and financial sources and feasibility of integrating existing infrastructures and/or establishing new ones, as well as frameworks for data access and ownership. Ways to enhance integration and/or cooperation with industry should be addressed. The need for international cooperation and linkages to existing relevant infrastructures in third countries should be considered.
Funding scheme: Coordination and Support Action (supporting action).
Additional information: One project may be funded.
Expected impact: The study will provide recommendations as regard the implementation of infrastructures development in the future. It will inform the European Strategy Forum on Research Infrastructures (ESFRI) Roadmap and future European funding programmes. Such infrastructure(s) will contribute to improving scientific performance and to enhancing technological development capacity in the field of food and health research. The infrastructure(s) will contribute to the development of more effective nutritional interventions, cohort studies, and dietary recommendations, and to the development of more rigorous approaches and methodologies in the field. The European added value of the research infrastructure(s) lies in fostering innovation and the cost-effective use of scientific resources

in food and health research. The infrastructure(s) would be able to support the Commission Recommendation on the Joint Programming Initiative addressing 'A healthy diet for a healthy life', and to better exploitation of sound scientific data and knowledge by the food industry.

KBBE.2012.2.2-03: Impact of lifestyle on well-being and diet-related disease

Call: FP7-KBBE-2012-6 – single stage

The objective is to improve understanding of the effects of lifestyle factors on human health and their relative importance, so as to contribute to developing new ways for the prevention of diet-related diseases, and for maintaining and promoting optimal health and well-being across lifespan and ultimately towards healthy ageing. The effects of lifestyle factors, diet and physical activity and their interaction with other lifestyle factors, such as sleep and stress, should be considered, as well as links with behavioural, environmental, cultural and socio-economic components. The research will aim at augmenting scientific understanding as it applies to humans based on epidemiological and/or intervention studies. The lifestyle factors influencing health should be representative of those currently pertaining at European level, with a view to contributing to better strategy in public health. The EU's ageing population is a major challenge, with significant social and economic implications, so research should address all age groups and include elderly subjects. Where appropriate, gender issues should be considered.

Funding Scheme: Collaborative Project (large-scale integrating project).

Additional information: One project may be funded.

Expected impact: The project will provide more knowledge on the relationship between lifestyle factors, health and well-being, and evidence of the importance of lifestyle in helping to prevent diet-related diseases and contribute to healthy ageing of the population in Europe. The European added value lies in the fact that the expected project results should clearly be of interest and potential benefit to European citizens, in particular elderly population, as they will help to inform new strategies in public health. Projects supported under this topic should integrate relevant partners from Australia, Canada, New Zealand, and/or the USA. The participation of partners from those countries is essential to achieve the expected impact of the research to be undertaken.

Area 2.2.3 Food processing

Optimising innovation in the European food industry through the integration of advanced technologies into traditional food production including fermented food, tailored process technologies to enhance the functionality, quality and nutritional value of food including organoleptic aspects in food production including new foodstuffs. Development and demonstration of high-tech, eco-efficient processing and packaging systems, smart control applications and more efficient valorisation and management of by-products, wastes, water and energy. New research will also develop sustainable and novel technologies for animal feed, including safe feed processing formulations and for feed quality control.

KBBE.2012.2.3-01: Feed production from food waste

Call: FP7-KBBE-2012-6 – single stage

Food waste represents a large proportion of bio-waste produced in the EU. It is generated by production, manufacturing, distribution and households, and is usually disposed of in land fill or is incinerated. In line with the objectives of EU2020, which aims to deliver a sustainable economy based on resource-efficient and greener strategies, research is needed to develop innovative concepts and practical approaches that would add value to and find markets for food waste of plant and dairy origin. The objective is to develop feeds and/or feed ingredients from food waste that are in line with standard nutritional requirements for animals, contribute

to the quality of resulting food products, and do not have adverse effects on human health. The feed and/or feed ingredients should be developed while taking into consideration low production costs, convenience, shelf-life, safety, and animal needs. If applicable, an environmental, social and economic life-cycle assessment in line with the International Reference Life Cycle Data System (ILCD) Handbook should be carried out. Dissemination and demonstration activities will be required to fill the gap between the developed concepts and their practical implementation.

Funding scheme: Collaborative Project (small or medium-scale focused research project targeted to SMEs).

Additional eligibility criteria:

– SME-targeted Collaborative Projects will only be selected for funding on condition that the estimated EU contribution going to SME(s) is 35 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: One project may be funded.

Expected impact: The European added value lies in enhanced innovation capacity and competitiveness in the field of feed processing, thanks to the development of new products and processes. Efficient use of food waste resources and energy will have a positive environmental outcome and contribute to a decrease in production costs for feeds. The expected projects results should clearly be of interest and potential benefit to SMEs. Projects supported under this topic should lead to a greater integration of research actors and activities from across the European Union, and the candidate countries.

KBBE.2012.2.3-02: Exploitation of Framework Programme project results in food processing by small and medium-sized enterprises

Call: FP7-KBBE-2012-6 – single stage

The aim of this topic is to allow SMEs to take up research outcomes resulting from earlier FP funding in food processing. The follow-up project should turn available scientific and technological knowledge into innovative processes or products, thereby clearly going beyond the earlier project(s) and involving a demonstration phase, an environmental, social and economic life-cycle assessment in line with the International Reference Life Cycle Data System (ILCD) Handbook (if applicable), and a business plan. The application must show that the knowledge has been generated earlier, and that the results have already been achieved and are available for further research and development — mere 'expected results' are not acceptable as a basis for project selection. Although the principal research must have been carried out in earlier project(s), further research and development must remain central to the project and will allow SMEs to get nearer to actual application.

Funding scheme: Collaborative Project (small or medium-scale focused research project targeted to SMEs)

Additional eligibility criteria:

– SME-targeted Collaborative Projects will only be selected for funding on condition that the estimated EU contribution going to SME(s) is 75 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

– The maximum duration of a project is two years.

Additional information: Up to five projects may be funded.

Expected impact: This approach gives more attention to the innovation phase and could lead to demonstrators, prototypes, technology transfer, filing for patents, and other outcomes. As

well as improving the impact of an earlier project, it will improve the S&T capabilities, the innovation potential and the competitiveness of the SMEs taking part. The European added value lies mainly in a leverage effect on private investment, the cooperation of private companies with foreign partners on a scale not possible at national level, and the reduction of commercial risk by making existing research results applicable across Europe and beyond.

KBBE.2012.2.3-03: Automation in food packaging systems

Call: FP7-KBBE-2012-6 – single stage

The high number of food product varieties and units, as well as packaging types dictated by customer requirements, means the food packaging industry is geared towards short runs and small batch production. The aim of this topic is to develop automated packaging systems to reach standardised operational flexibility in the packaging industry for both fresh and processed food, also ensuring convenience. Effectiveness, efficiency and reliability of the processes must be considered, as well as hygiene – equipment must be easy to clean. If applicable, an environmental, social and economic life-cycle assessment in line with the International Reference Life Cycle Data System (ILCD) Handbook should be carried out. Integration of advanced technologies within robotics, automation of hygienic food handling operations, sensors, in-line quality control as well as information and communication technologies for intelligent management, ensuring traceability, will have to be achieved. Demonstration activities involving packaging and food companies will be required to fill the gap between developed concepts and their practical implementation.

Funding scheme: Collaborative Project (large-scale integrating project).

Additional information: One project may be funded.

Expected impact: The topic will increase excellence in the field of ICT and automation applications for packaging processes, and support the competitiveness of European robotics, packaging and food industries, for example, via the development of new processes or an increased number of patents. In the agri-food business, it will contribute to reducing food wastage, lowering production costs, improving food quality and safety, and convenience. The results of research in this topic should clearly be of interest and potential benefit to SMEs, both in the equipment and the food industry. Involving SMEs in the project itself should help contribute to achieving that benefit. The European added value lies in the need to find critical mass for multilateral efforts on the part of all players mentioned above.

KBBE.2012.2.3-04: Personalised approaches to food production and distribution

Call: FP7-KBBE-2012-6 – single stage

The aim is to further develop processing, packaging and distribution aspects of convenient, personalised food products attractive to the consumer. Personalisation can take many forms, and might refer to individual health or lifestyle aspects and/or address personal preferences regarding quality, portion size or cost, convenience, packaging, taste or pleasure, or it might concern specific target groups. The project will provide integrated approaches applicable to SMEs that include innovative technological and organisational solutions for production and processing of personalised foods, their delivery to consumers at the point of purchase, and their preparation at the point of consumption. The project should involve scientists, industry (especially SMEs), catering services and/or retailers. It should be emphasised that this topic definitely goes beyond the following issues: nutrigenomics, genotyping and phenotyping; specific nutrients; dietary advice. The conceptual models should be applied to developing prototype foods for a limited segment of the market, preferably in a demonstration unit. Dissemination and demonstration of the technological and organisational solutions developed will be required. If applicable, an environmental, social and economic life-cycle assessment in

line with the International Reference Life Cycle Data System (ILCD) Handbook should be carried out.

Funding scheme: Collaborative Project (small or medium-scale focused research project targeted to SMEs).

Additional eligibility criteria:

– SME-targeted Collaborative Projects will only be selected for funding on condition that the estimated EU contribution going to SME(s) is 35 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: Up to two projects may be funded.

Expected impact: The European added value lies in strengthening European research capacity to provide sound scientific support to a technology that might be an important breakthrough in food distribution. Processing and distribution technologies will be integrated into innovative applications with direct impact on the consumer leading to social innovation. In the long run, a strong contribution to diversifying the food industry's range of products for consumers is expected.

KBBE.2012.2.3-05: Insects as novel sources of proteins — SICA

Call: FP7-KBBE-2012-6 – single stage

The objective is to exploit the potential of insects as alternative sources of protein. Several ways of processing the proteins are to be explored in view of their potential incorporation into feed and/or food products. Aspects of insect breeding and processing such as energy use, efficiency and how residual flows develop and can best be dealt with will also be looked into. Issues related to quality, animal health and human safety have to be addressed, for instance, through examining amino acid composition and allergenicity; and quality and safety criteria of the derived proteins should be developed at a European level. Regulatory and consumer aspects should also be looked into. If applicable, an environmental, social and economic life-cycle assessment in line with the International Reference Life Cycle Data System (ILCD) Handbook should be carried out. Dissemination activities and demonstration activities will be required.

Funding scheme: Collaborative Project (small or medium-scale focused research project) for Specific Cooperation Actions dedicated to International Cooperation partner countries.

Additional eligibility criteria:

– Minimum number of participants: three from different Member States or Associated countries and three from different ICPC.

Additional information: One project may be funded.

Expected impact: The European and ICPC added value lies in increasing the innovation capacity of the industry, and in enhancing international cooperation. The expected results will enable the sustainable production of innovative protein sources successful in the market. The result of research into this topic should be of interest and potential benefit to SMEs. The research will support EU agricultural, nutrition, health, environment and development policies.

<u>Area 2.2.4 Food quality and safety</u>

Assuring chemical and micro-biological safety and improving quality in the European food supply. This will include understanding the links between microbial ecology and food safety; developing methods and models addressing the integrity of the food supply chains; new detection methods, traceability and its further development, technologies and tools for risk assessment, including emerging risks, management, and communication, as well as enhancing

the understanding of risk perception. This will also include science based methods for risk benchmarking in the field of food safety.

KBBE.2012.2.4-01: Contaminants[16] in seafood[17] and their impact on public health (The Ocean of Tomorrow)

Call: FP7-KBBE-2012-6 – single stage

Pollution of the oceans and climate change are giving rise to concerns not just about the status of the marine environment, but also about their impact on seafood safety and public health. In addition, there is rarely a well-defined established simple quantitative link between levels of contaminants in the marine environment and levels in seafood, clearly demonstrating a general need for research on transfer of contaminants from the marine environment to seafood. The main objective of the topic is to assess food safety issues related to priority contaminants present in seafood as a result of environmental contamination (including those originating from harmful algae blooms and those associated with marine litter). Further understanding of the public health impacts of these chemical hazards should be developed, together with tools for risk analysis and methods of monitoring, detection and mitigation. To reduce public health risks, clear and practical information should be disseminated to policy makers, food producers and the general public.

Funding scheme: Collaborative Project (small or medium-scale focused research project targeted to SMEs).

Additional eligibility criteria:

– Projects will only be selected for funding on condition that the estimated EU contribution going to SME(s) is 10 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: One project may be funded.

Expected impact: The European added value lies in offering safe, high-quality seafood to consumers, as well as in strengthening the competitiveness of European food producers. The expected project results should clearly be of interest and potential benefit to food-producing SMEs, and involving those SMEs in the project itself should help contribute to achieving this. Scientific evidence will be provided to serve as a basis for further development of common food safety, public health and environmental policies and measures. The project will contribute to descriptors 9 and 10 of the Marine Strategy Framework Directive (2008/56/EC) by seeking to establish a quantitative link between the contamination of the marine environment and that of seafood.

KBBE.2012.2.4-02: Food safety and quality issues related to parasites in seafood[18]

Call: FP7-KBBE-2012-6 – single stage

Demographic changes and globalisation of the food supply chain have led to an expansion of the population at risk of seafood-borne parasitic disease and consequently increased the recognition of its public health significance. Therefore, the objective of this topic is to further develop the understanding of food safety and quality aspects related to parasites of public

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16 For the scope of this topic, the term 'contaminants' means hazardous substances (i.e. chemical elements and compounds) or groups of substances that are toxic, persistent and liable to bio-accumulate, and other substances or groups of substances that give rise to an equivalent level of concern.

17 For the scope of this topic, the term 'seafood' includes fishery products and live bivalve molluscs as defined in Regulation (EC) No 853/2004 laying down specific hygiene rules for food of animal origin.

18 For the scope of this topic the term 'seafood' includes fishery products and live bivalve molluscs as defined in Regulation (EC) No 853/2004 laying down specific hygiene rules for food of animal origin.

health importance in seafood. Further understanding of the public health impacts of these biological hazards should be developed, together with tools for risk analysis and methods of monitoring, detection and mitigation. To reduce the risks of human seafood-borne diseases, clear and practical information should be disseminated to policy makers, food producers and the general public.

Funding scheme: Collaborative Project (small or medium-scale focused research project targeted to SMEs).

Additional eligibility criteria:

– Projects will only be selected for funding on condition that the estimated EU contribution going to SME(s) is 30 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: One project may be funded.

Expected impact: The European added value lies in offering safe, high-quality seafood to consumers, as well as in strengthening the competitiveness of European food producers. The expected project results should clearly be of interest and potential benefit to food-producing SMEs, and involving those SMEs in the project itself should help contribute to achieving this. Scientific evidence will be provided to serve as a basis for further development of common food safety and public health policies. The project will contribute to food safety policy by addressing the research needs identified in the EFSA scientific opinion on risk assessment of parasites in fishery products. Given that a large percentage of the seafood consumed in the EU is imported from Asia, the project should integrate relevant partners from Asian countries. The participation of partners from those countries is important to achieve the expected impact of the research to be undertaken.

KBBE.2012.2.4-03: Strengthening cooperation for global food safety research

Call: FP7-KBBE-2012-6 – single stage

The aim of this coordinating action is to connect research and policy actors in the European Union with their third-country counterparts to achieve deeper cooperation and fill transitional gaps concerning food safety. The coordination action will consist of a set of activities focussing on coordination of research, innovation and training activities and policies in the area of food safety.

Funding scheme: Coordination and Support Action (coordinating action).

Additional information: One project may be funded.

Expected impact: The European added value of this topic lies in its potential contribution to structuring and enhancing the global dimension of the European Research Area in the field of food safety in a sustainable way. Broad cooperation will lead to more efficient use of research funds, sharing of best practices and a durable partnership with the EU's major food trading partners. Projects supported under this topic should integrate relevant partners world-wide. Bringing in the appropriate European and global dimension in a complimentary and balanced way will improve the effectiveness and long-term sustainability of the consortium.

KBBE.2012.2.4-04: Towards evidence-based risk management of food allergies

Call: FP7-KBBE-2012-6 – single stage

A consistent approach to risk assessment and management of allergens across the food chain is needed. Clinically validated risk models for the risk assessment should be proposed and allergen management tools and algorithms for the food industry should be developed. Individual thresholds and population dose-distributions need to be investigated, taking into account how extrinsic factors, the food matrix and processing impact on the stability of threshold doses and clinical reactivity. Validated, evidence-based risk management strategies

for allergenic foods should be proposed. Risk models will be made publicly available and associated with databases and other web-based platforms to support Europe-wide dissemination to the food industry. Exploiting results of previous studies, new data are required on the influence of maternal diet and weaning practices on the patterns and prevalence of allergies. Biomarkers to predict severe allergic reactions to food and the risk to develop such reactions should be assessed. Differences in populations across Europe should be investigated. Dietary strategies for food allergy prevention should be investigated. Analytical methodology to determine multiple allergens in foods should be further developed and their efficacy to allow measuring allergens in a wide range of foods from raw materials to commercially available products demonstrated.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

Additional eligibility criteria:

– SME-targeted Collaborative Projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 15 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: One project may be funded.

Expected impact: The European added value lies in providing a framework to consistently apply risk assessment and management of food allergens across the EU and beyond, which should contribute to the updating of the EU list of allergen in accordance with the procedure laid down in the EU legislation. The provision of evidence-based action levels for allergens in foods and the resulting management tools will enable the food industry to become more competitive and sustainable and promote innovation by reducing costs and helping drive harmonisation across the food chain. Consumer protection will be improved through more accurate, risk-based controls and labelling. It will contribute to further strengthening of national and EU dietary advice and public health by providing new scientific knowledge on the effect of infant feeding to prevent the development of allergies later in life.

KBBE.2012.2.4-05: Post-market monitoring of GMOs based on epidemiological studies

Call: FP7-KBBE-2012-6 – single stage

Genetically modified (GM) feed is widely used in the EU and may, in some circumstances, constitute an essential part of the diet of farm animals. While it is possible to monitor the growth of farm animals and collect precise information on their diet and general health status, information on epidemiological studies to assess the impact of the consumption of GM Feed on animals is limited. Moreover, there is a lack of agreed scientific methodologies for performing such studies. The project should investigate the feasibility of carrying out epidemiological studies on the safety and nutritional impacts of the consumption of GM feed placed on the EU market. The selected project will: (a) identify relevant, existing epidemiological studies on GM feed or non-GM feed in Europe and/or in third countries; (b) identify and collect readily available information in a database enabling epidemiological studies to be performed; (c) establish a robust epidemiological model (which should include data collection, a monitoring plan, a monitoring methodology, statistical analysis and reporting). The model should, as far as possible, make use of already available data. Should additional data need to be collected, it should be carefully evaluated to ensure it meets the specific needs of the project. Data collection should be developed in a way that is realistic, feasible and which will ensure the efficient use of resources. (d) The model should be assessed and validated for the main situations encountered in Europe, considering in particular maize and soy, feeding on pigs, chickens and bovines. The project should consider, in particular but not exclusively, the type of GM feed, the animal species, the related time

period of feeding, the number and age of animals, the specific living conditions (husbandry conditions, geographical regions, etc.).
Funding scheme: Coordination and Support Action (coordinating action).
Additional information: One project may be funded.
Expected impact: The development of an epidemiological model to investigate the safety and nutritional impact of the consumption of GM Feed will enable epidemiological studies to be carried out in support the preparation of monitoring plans that may be required under EU legislation.

Area 2.2.5 Environmental impacts and total food chain

Protecting both human health and the environment through a better understanding of the environmental impact on and from food/feed chains. This will involve study of food contaminants and health outcomes, monitoring of environmental effects, developing enhanced tools and methods for the assessment and management of impacts on, and resistance of, food and feed chains to global changes, in particular to the environment. Assuring quality and the integrity of the food chain requires new models for commodity chain analysis and total food chain management concepts, including consumer aspects.

KBBE.2012.2.5-01: Microbially safe water for human consumption[19]

Call: FP7-KBBE-2012-6 – single stage

New research approaches are needed to enable rapid determination of the pathogen load of European drinking water sources and supply systems used for food processing and preparation, human consumption and drinking. The new approaches should be based on molecular methods and complement the current time-consuming microbiological techniques, which are based on the cultivation of indicator bacteria. Highly standardised methods are essential, validated with certified molecular reference material. The approaches will need to address the issue of inhibition of molecular methods and assess the significance of any positive detection. The combination of molecular techniques with electronic sensors will also be investigated. The new techniques will result in detailed insight into the pathogen load, the hygienic quality and the specific microbial strains (viruses, bacteria, protozoa) responsible for outbreaks of waterborne infections. They will lead to better understanding of the sources, infectivity and virulence of these strains. The efficacy of the new techniques has to be demonstrated.
Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).
Additional eligibility criteria:

– SME-targeted Collaborative Projects will only be selected for funding on condition that the estimated EU contribution going to SME(s) is 25 % or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: One project may be funded.
Expected impact: The European added value of this topic will be the development of a new, uniform, Europe-wide approach regarding drinking water safety management plans. The topic will give support to the Drinking Water Directive (98/83/EC)[20] and the EU Innovation Union. It will also contribute to public health and to climate change preparedness, as the latter is a

[19] As drinking water is part of food, there is no risk of overlap with the work programme of the Theme Environment.
[20] OJ L 330, 5.12.1998, p. 32.

driver responsible for the emergence of new microbial strains that could potentially introduce new infectious diseases. More comprehensive, faster assessment of human health risks from surface and ground water will be beneficial to the industry (commercialisation of technologies, new markets), water companies and laboratories dealing with water quality control. Integrated sensor-molecular techniques have applications potential for early warning systems, source tracking and rapid retrospective outbreak analysis for water-borne and food-borne infections. In addition, the topic will strengthen relations between researchers and industry, and further disseminate results of advanced research towards practical applications in water quality analysis. Projects supported under this topic should lead to a greater integration of research actors and activities from across the European Union, and the candidate countries.

KBBE.2012.2.5-02: Optimising food use for social innovation

Call: FP7-KBBE-2012-6 – single stage

Numerous families in Europe have been pushed to the edge of poverty by the current economic crisis and are facing difficulties in purchasing quality foods. At the same time, a large amount of food in Europe is wasted in the retail and catering sector, in restaurants and households. The current lack of unambiguous data regarding food waste, however, makes it impossible to define policy and other measures to appropriately deal with this issue and reduce the social and environmental impacts of food wastage. The widely differing sources of information at Member State level hinder the availability of relevant, high-quality and comparable data, resulting in a fragmented, partially redundant and often incomplete picture on food waste, which impedes the analysis of long-term trends in food waste management. This topic aims (1) at obtaining reliable data and information sources to improve understanding of the patterns and causes of food waste, at giving possible solutions for improved food use, and at making recommendations to policy makers for social innovation. The project should also aim (2) at setting up European and national multi-stakeholder platforms (comprising, among others, consumer organisations, food services, retailers, NGOs, regulators, food industry, food scientists, and socio-economic experts) to look at options to prevent or reduce food wastage at household, food service and retail level. The platforms (3) should produce recommendations to be used for policy makers and regulators at European and national level addressing socially innovative solutions for optimised food use including also socio-economic incentives and improved legislation. In addition, the platforms (4) should test some best practices for reducing food wastage (for example regarding logistics) via feasibility studies with all stakeholders involved.

Funding Scheme: Coordination and Support Action (supporting action).

Additional information: One project may be funded.

Expected impact: This topic will improve the coordination of the monitoring activities by the Member States on food wastage and its social and environmental impacts. The data collected through standardised methodologies will, in turn, allow EUROSTAT and the Member States to report correctly on the issue of food waste and ultimately facilitate the shaping of better food waste management strategies. Improving the food waste reporting requirements at EU and Member State level is seen as an essential step for the prevention of food wastage. It will also enable policy initiatives aiming at coherent food safety and hygiene regulation, labelling (best-before date), food distribution, and awareness and educations campaigns to all players involved. In the context of social innovation, the feasibility studies carried out should show best-practice examples to be applied by others. The project supported under this topic should lead to a greater integration of research actors and activities from across the European Union, and the candidate countries.

KBBE.2012.2.5-03: A comparative analysis of global versus local food supply systems

Call: FP7-KBBE-2012-6 – single stage

The EU consumer has been used to purchasing quality food at affordable prices. The food crisis of 2007-2009 and current food price spikes have marked an end to this certainty. Buying local food is advocated as more sustainable by some professional groups and a justified alternative to buying from global food supply chains, though the benefits of this are not substantiated by scientific evidence. There is currently no comprehensive EU-wide database on the advantages, drawbacks and total cost of local versus global food production and supply systems. The objective of this topic is to analyse the benefits and disadvantages of both systems in terms of value and sustainability. A full understanding of the real cost of food is needed. This includes the examination of external costs, which may refer to environmental degradation, food safety surveillance systems, public health, fair income distribution, and animal welfare or any other cost which is still ignored, minimised or moved to another economic sector of society.

Funding scheme: Collaborative Project (small or medium-scale focused research project).

Additional information: One project may be funded.

Expected impact: The EU added value of this topic lies in its potential to create a common scientific basis for supporting food-related EU policies with an impact on social innovation. A better understanding of external costs would facilitate comparison between global and local food systems and enable evidence-based decision-making concerning which food systems to support. Enhanced knowledge of the real cost of food could harness demand towards sustainably-produced food as a consumer segment that is likely to continue growing. Equally, it could help to identify situations in which moves to increase sustainability could have an impact on the poorest people, who will require support. Projects supported under this topic should lead to a greater integration of research actors and activities from across the European Union, and the candidate countries.

Activity 2.3 Life sciences, biotechnology and biochemistry for sustainable non-food products and processes

– *Strengthening the knowledge base and developing advanced technologies for terrestrial or marine bio-mass production for applications in industrial processes and in energy production. This will include plant, animal and microbial genomics and metabolomics to improve the productivity and composition of raw materials and bio-mass feedstocks for optimised conversion to high added-value products including biological resources utilisable in pharmaceutical industry and medicine, while exploiting natural or enhanced terrestrial and aquatic organisms as novel sources. This will fully incorporate life cycle analysis of bio-mass production practices, transportation, and storage and market deployment of bio-products.*

– *Addressing the application of industrial bio-technologies within whole crop and forest bio-mass chains to realise the full potential of the bio-refinery approach (e.g. green chemicals), including socioeconomic, agronomic, and ecological and consumer aspects. This will be enhanced by an increased understanding and control of plant and microbial metabolism at the cellular and sub-cellular level, and how this is integrated into whole system performance in the production of high value commodities deploying bio-processes with increased yield, quality and purity of conversion products, including bio-catalytic process design.*

– *Using or developing bio-technologies for novel and improved high quality, high added-value and renewable forest based products and processes to increase sustainability of wood and wood production, including timber, renewable materials and bio-energy stocks.*

– *Addressing the potential of biotechnology to detect, monitor, prevent, treat and remove pollution.*

– *Maximising the economic value of waste and by-products through new and potentially energy-saving bio-processes, alone or in combination with plant systems and/or chemical catalysts.*

Area 2.3.1 Novel sources of biomass and bioproducts

The production of bio-mass in terrestrial environments is of greatest importance for the development of the KBBE as this will deliver feedstocks and precursors for nearly all bio-industries or directly saleable end-products.
Research and development activities will foster the optimisation of these biomasses for industrial purposes. It will generate knowledge in metabolic control, pathway design, metabolic engineering in plants, animals and other organisms (such as fungi)[21]*, and domestication and breeding, also improving agricultural traits. Novelty will rely to some extent on screening of terrestrial biodiversity and discovery of new organisms and new biochemical pathways. The development and optimisation of novel expression systems in terrestrial organisms will eventually lead to new products and practices.*

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21 However, the focus will be on plant and animal biotechnology. Microbial biotechnology will be mainly covered in Areas 2.3.3 and 2.3.5.

KBBE.2012.3.1-01: Improved water stress tolerance of crop plants

Call: FP7-KBBE-2012-6 – single stage

Change in global climate is predicted to increase dramatically the variability of water supply, both in spatially and in time, and will, thus affect growth of crops. Several European regions are already under severe risk of drought, extreme temperatures, and of other types of abiotic stress linked to water (e.g. as a result of periodic flooding or salt stress). The project will address water stress affecting crop plants (including trees and shrubs) and will develop agricultural plant varieties better equipped to withstand water stress, useful for production of biomass and bioproducts. The project will target commercially important crops using state-of-the-art knowledge on physiological, molecular and genetic processes obtained e.g. on model plants, involved in plant tolerance and adaptation to water stress for developing robust crops with improved traits for biomass yield, productivity and quality under adverse and/or erratic environmental conditions. The project will contribute to understanding the complex interactions between the molecular pathways of signalling related to abiotic stress with those controlling cell and organ growth. It will put this knowledge into practice through innovative, integrative approaches of molecular breeding and/or genetic optimisation. As an integral part, the project will include the environmental assessment of the cultivation of the developed plants. The dissemination activities will form an essential part of the project. It shall consider appropriate training opportunities (e.g. short staff exchanges, training workshops).

The proposal should take account of related on-going FP7 funded research (e.g. projects DROPS, SWEETFUEL) in order to avoid overlaps and duplications.

Funding Scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

Additional eligibility criteria:

- SME-targeted collaborative projects will only be selected for funding on the condition that the EU contribution going to SME(s) is 25% of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before the signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: One project may be funded.

Expected impact: The project will improve agricultural production to better adapt it to the erratic, unpredictable conditions under the climate change. Its European added value will come from creating a critical mass necessary to contribute to better exploitation and socio-economic development of marginal lands and regions in Europe, particularly those already affected by adverse water stress conditions. The project will involve active participation of European SMEs and industry, increasing its competitiveness

KBBE.2012.3.1-02: Multipurpose crops for industrial bioproducts and biomass

Call: FP7-KBBE-2012-6 – single stage

The projects on 'multipurpose crops' developed under this topic will advance the innovative research needed to bring to market sustainable and biodegradable biomaterials originating from terrestrial crop plants. They will advance the concept of the plant based production system by improving the exploitability of the biomass, and developing specific bioproducts from plants in a modern biorefinery. This will be achieved by applying modern molecular tools of plant breeding, combined with improvements in metabolic and/or genetic engineering and by incorporating appropriate technical advances in agronomic practices (e.g. field trials) in order to develop commercial terrestrial plant varieties. The bioproducts to be targeted will include bio-based polymers (including bio-based plastics), fibres (including bio-composites), and non-food oils. The project will also analyse the economic potential of the residual biomass (e.g. for bioenergy applications) and will assess environmental sustainability. The project will be industry-driven and will include demonstration activities to prove the technical

feasibility and effectiveness of the production and extraction systems developed. Dissemination and training activities will form an essential part of the project.
Funding Scheme: Collaborative Project (large-scale integrating project targeted to SMEs).
Additional eligibility criteria:
– SME-targeted collaborative projects will only be selected for funding on the condition that the EU contribution going to SME(s) is 25% of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before the signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.
Additional information: Up to two projects may be funded.
Expected impact: The use of the biodegradable, eco-friendly biomaterials and biomass resulting from the crops developed in the project will lead to significant environmental and economic benefits. The project will engage European industry and improve its competitiveness, as well as increase competition in research and innovation. Participation of SMEs and industries is critical for the objectives and for achievement of impact. An additional impact of the project will also come from EU - scale of dissemination of results, leading to a better exploitation of research.

KBBE.2012.3.1-03: EU – China Partnering Initiative on fibre crops – Mandatory China
Call: FP7-KBBE-2012-6 – single stage

There is a renewed interest in fibre crops as a sustainable source of biobased material for industrial products. The scope of this co-ordination action is to link the research activities carried out on the one side by the EU research programmes (EU Framework Programmes and EU Member States' national programmes) and, on the other, by related research programmes coordinated by China national institutions, e.g. Chinese Academy of Agricultural Sciences (CAAS). The area targeted concerns development of a resource efficient system via optimisation of raw material from fibre crops for multiple uses. This product chain implies the biorefinery concept. The project will ensure a wide-range networking of the relevant scientific communities and stakeholders and the systematic establishment of linkages between the on-going research and innovation projects from the EU and China. Co-ordination of on-going activities from both sides could include a combination of: i) broad networking of the respective scientific communities (via meetings, workshops, etc); ii) twinning of large sets of research projects/consortia from the counterparts' programmes, with meetings and exchanges of information, data, materials and methods; iii) short-term exchanges/visits of researchers, training opportunities. Furthermore this co-ordination action should also lead to a coordinated planning of relevant future research initiatives.
Funding Scheme: Coordination and Support Action (coordinating action).
Additional eligibility criteria:
– Minimum number of participants: 3 from different Member States or Associated Countries and 1 from China.
Additional information: One project may be funded. The China Academy of Agricultural Sciences (CAAS) intends to support or/and carry out mirroring and complementary actions. The cooperation with these complementary actions should be reflected in the proposal. This will be considered in the evaluation of the proposal.
Expected impact: A wide co-ordination of research activities in this area from the EU and China, which are both major players in these fields, will scale-up EU-China collaboration, in line with the EU-China S&T co-operation agreement. This will lead to a wider industrial participation and will provide a long term vision on future common research activities, contributing to the international policies of the EU. The project will improve training opportunities of researchers.

Area 2.3.2 Marine and fresh-water biotechnology (blue biotechnology)

The economic and scientific potentials of aquatic environments (principally marine but including freshwater also) remain insufficiently explored using the power that modern biotechnology provides. Moreover, their resources remain largely untapped by European industry. Extreme or specific environmental conditions (e.g. in temperature, pressure, salt content, pH, chemical composition) and the enormous biodiversity of these ecosystems offer multiple opportunities for bio-prospecting, exploitation and use of microbes (e.g. cyanobacteria, fungi), plants (micro- and macro-algae) and animals (e.g. fish, molluscs, sponges) and their physiological performance and genes. This can lead to novel products or sources for industrial applications (e.g. bio-processing, biomass, bio-energy, bio-materials, specialties, pharmaceuticals, and aquaculture) and beyond.

KBBE.2012.3.2-01: Innovative marine biodiscovery pipelines for novel industrial products

Call: FP7-KBBE-2012-6 – single stage

Marine organisms represent an almost inexhaustible source of bioactive compounds and of novel molecules and materials for industrial applications (e.g. chemicals, pharmaceuticals, biomaterials, cosmetics, etc.). In order to unveil novel products and processes, , comprehensive and integrated efforts are needed that focus on industry's requirements.

The projects under this topic are to be industry-driven. They will aim to innovative approaches to tackle bottlenecks in the biodiscovery pipeline. The projects will include demonstration activities of the biodiscovery pipeline (either in its entirety or in part). While the projects may include biomass production, this will not be their prime focus.

Key challenges to be considered are (i) the quality of marine resources: identification of organisms of interest and their variability. Special emphasis in this point is needed in the case organisms from unusual and extreme environments; (ii) improvement in technical aspects of the biodiscovery pipeline. This may include separation, structure elucidation and identification of the active profile of bioactive molecules, dereplication strategies, etc; (iii) sustainable modes of supply of raw materials, which may include providing analogues of active compounds (iv) legal aspects: securing access to marine resources, their sustainable use, analyses of the different legal aspects that impede access to marine bioresources and ways forward and (v) access to marine biotechnology data: through marine research infrastructures and biobanks.

Dissemination of the results and activities to users, industries, firms (SMEs in particular) and citizens leading to a better exploitation of research and raising awareness of its potential should be taken on board within the project.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs)

Additional eligibility criterion: SME-targeted collaborative projects will only be selected for funding on the condition that the EU contribution going to SME(s) is 25% of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before the signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: This topic represents a major effort to support innovation in the European Marine biotechnology sector, enhance competitiveness of the European biotechnology industries and provide a considerable contribution to the Knowledge Based Bio-economy.

Expected impact: The projects will strengthen the competitiveness of the European marine biotechnology industry. By reducing the technical bottlenecks in the marine biodiscovery pipelines, improving access to marine resources data and streamlining the legal aspects towards a clear access, the projects will have a structuring impact on the European Research

area in this field and will give support to EU policy, finally, making the whole sector more attractive to investment by the biotechnology industry.

KBBE.2012.3.2-02: Improved cultivation efficiency of marine microorganisms

Call: FP7-KBBE-2012-6 – single stage

Many of the bioactive compounds of interest for the marine biotechnology industry are produced by microorganisms that cannot currently be cultured in an efficient way. This presents a major bottleneck for industries in this sector, which require a reliable supply of compounds with sufficiently high volumetric productivities and purity specifications.

To address this challenge a significant, integrated effort is needed to improve the culture efficiency of marine microorganisms. This effort should include issues such as: radical changes in isolation rate; innovative high throughput culture mimicking nature; improving understanding of the cell-to-cell communication in the microbial world; and development of innovative procedures that enable the combination of these optimised methods with specific devices and robotics. The project will embrace these research priorities and integrate them within the context of specific industrial applications.

Dissemination of the results and activities to users, industries, firms (SMEs in particular) and citizens leading to a better exploitation of research and raising awareness of its potential should be taken on board within the project.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs)

Additional eligibility criteria:

- SME-targeted collaborative projects will only be selected for funding on the condition that the EU contribution going to SME(s) is 25% of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before the signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: One project may be funded.

Expected impact: The project will strengthen the competitiveness of European industry, by providing a science and technology base for the development products for the rapidly increasing world market for biotech products. Close collaboration in research between European biotechnology industries and leading research institutions will reinforce the scientific and technological excellence and also the industrial and economic potential of the research.

Area 2.3.3 Industrial biotechnology: novel high added-value bio-products and bio-processes

This area will address the development and application of industrial biotechnology for the production of high-value products such as fine and speciality chemicals, antibiotics, vitamins, detergents, etc. Industrial biotechnology enables industries to deliver novel products which cannot be produced by conventional industrial methods; in addition it will make possible replacing chemical processes by more resource efficient biotechnological methods with reduced environmental impact, thereby extending and strengthening the KBBE.

Research and development will enable among others the discovery of novel enzymes and micro-organisms with novel applications, the elucidation and optimisation of their functions, improvements in concept and design of bioreactors, such as biocatalytic process design, advancing fermentation science and engineering, and improving up- and down-stream processing where relevant.

KBBE.2012.3.3-01: Overcoming hurdles for innovation in industrial biotechnology in Europe

Call: FP7-KBBE-2012-6 – single stage

Several hurdles hamper the full exploitation of Industrial Biotechnology's (IB) potential today:

- Lack of awareness of potential benefits that IB can offer to a number of established and often conservative sectors;
- Unfavourable framework conditions for innovation in IB due to regulatory uncertainty, e.g. on intellectual property rights, standards and labelling rules;
- Limited access to pilot plants and financing of demonstration plants for up-scaling;
- Limited available data on the use of biomass for the development of a wide range of bioproducts.

The objective of the project is to: i) identify relevant stakeholders and end-users at regional, national and European level; ii) create platforms enhancing the interaction between these groups with IB -related stakeholders (e.g. large industries and SMEs, industry associations, academia) with the aim to obtain a comprehensive overview of the market potential of IB, setting R&D priorities and identifying needs for pilot and demonstration plant activities.; iii) identify regulatory hurdles that may inhibit these collaborations and prepare a study for policy makers on key market entry barriers; iv) identify reliable data sources and establish a data collection that can be used for annual analyses and prospective studies (for 2020 and beyond) on the use of biomass for the production of bioproducts in the EU in general and by sector; v) establish robust communication and dissemination tools (e.g. a website, conferences, training, reports, brokerage events) that facilitate the transfer of knowledge and technology between all the stakeholders and will ensure a long lasting impact of the project.

The project will strengthen the IB sector as a provider of technological solutions for many industrial sectors (e.g. energy, chemicals, materials, consumer products and mining) and improve the balance between technology push and market pull. The data collection on the use of biomass for the production of bioproducts in the EU will constitute a basis for developing of an institutional frame for annual reporting, (e.g. like the EurObserv'ER on Renewable Energy), and will complement the reports on biomass use for energy under Directive 2009/28/EC. The project will provide clear indicators to measure the socio-economic and environmental impact of IB and the use of biomass for bioproducts in the EU (e.g. on employment, GDP, climate change mitigation potential).

The project will liaise with industry associations, European Technology Platforms (ETPs) and other relevant organisations and networks. Interaction with policy-makers, policy support bodies (e.g. JRC, EuroStat) and other relevant stakeholders (e.g. NGOs) at national and European level must be explored.

The activities of the project will take into account existing initiatives supporting innovation in IB under FP7 and the Competitiveness and Innovation Framework Programme.

Funding scheme: Coordination and Support Action (coordinating action).

Additional eligibility criteria:

– Minimum number of participants: 3 from different Member States or Associated countries.

Additional information: One project may be funded.

Expected impact: The project will support the creation of a more favourable environment for innovation in IB, thus enhancing European industrial competitiveness in this sector. In particular, it will contribute to establishing a healthy balance between technology push and market pull in the area of IB and thus reduce regulatory uncertainty and commercial risk, as well as leverage more private investment into IB solutions. The project's annual reports on the use of biomass for bioproducts will help establishing an efficient strategy for the biomass use in the EU.

KBBE.2012.3.3-02: Support to standardisation for bio-based products

Call: FP7-KBBE-2012-6 – single stage

A lack of standards hinders market uptake of bio-based products, both in consumer markets and in public procurement. Standards are needed for, among others, the determination of bio-based content (carbon and biomass), product functionalities and biodegradability. The objective of the topic is to support research leading to the following outcomes:

- Development of a standard test method and test data for completion into a generally applicable European Standard for bio-based carbon content measurement in different bioproducts, that will be, as a minimum, applicable to all of the following groups: bio-polymers, -lubricants, -surfactants, and –solvents.
- Development of a standard test method and testing scheme for determination of biomass content that is not solely dependent on C14 analysis. This methodology should be applicable in different bio-based products, including as a minimum, bio-polymers, -lubricants, -surfactants, and –solvents.
- Identification and resolution of functionality related bottlenecks with the view to adjusting, developing, harmonising and validating test methodologies considering the use of priority bio-based products, i.e. bio-polymers, -lubricants, -surfactants, and –solvents.
- Development of standard test methods, including all validation data, for completion into a generally applicable European Standard for the testing of the biodegradability of bio-lubricants and bio-solvents.

Proposals must ensure a link with the activities of the European Committee for Standardization (CEN) concerning bio-based products and take into consideration related standardisation mandates (already issued and in process). Projects should explore possibilities for harmonising standards and normative measures in the EU, US, Japan, China, Brazil, and other major trading partners. The mobilisation and networking of stakeholders concerned such as industrial organisations, public bodies, research organisations, will ensure the effective dissemination and implementation of the developed standards.

Funding Scheme: Collaborative Project (small or medium-scale focused research project).

Additional eligibility criteria:

– The duration of the proposals submitted under this topic shall be up to 3 years.

Additional information: One project may be funded.

Expected impact: Reducing barriers to trade in bio-based products and expanding the market potential and the competitiveness of European bio-based industry. In view of maximising the impact of the project, it is expected that the first two of the mentioned outcomes will be accomplished during the first half of the project. The project will contribute to realising the objectives of different relevant European policy initiatives, including at least the Lead Market Initiative in Bio-based Products, the Industrial Policy, the Environmental Technology Action Plan and the EU Strategy for Key Enabling Technologies.

KBBE.2012.3.3-03: Mastering integration and intensification of bioprocesses

Call: FP7-KBBE-2012-6 – single stage

The expansion and integration of biotechnology-based processes in chemical and chemical-using sectors (e.g. pharma, pulp and paper, energy, textile, etc) requires the development of a new generation of competitive and efficient bioprocesses.

Important industrial challenges in this endeavour are (i) development of strategies for process intensification (e.g. low-cost fermenters, novel reactor concepts, continuous processes, *in situ* product recovery, modular and multiphase bioreactors, cascade biocatalysis); (ii) improvement of process development and optimisation (e.g. by means of micro-bioreactors); (iii) development of technologies for better analytical continuous monitoring and control in bioreactors (iv) development of downstream processing (design and scale-up of economic

separation and purification processes for complex biochemical mixtures); (v) improvement of process efficiency, this includes low water use, water recycling and treatment.
The aim of this topic is to tackle one or several of these challenges described with a view to leveraging bioprocesses in order to make a selected industrial production chain economically viable and/or with reduced environmental impact. The bioprocesses developed are expected to replace conventional technologies in the chosen production chain and could pave the way for the commercial development of new bio-products.
Proposed concepts will be demonstrated at least to pilot scale as part of an integrated approach. Economic viability and eco-efficiency will be evaluated and assessed on a quantitative basis. A dissemination and exploitation plan will include a sound strategy for the effective transfer of the knowledge produced to the public and end users. The project will also include training activities such as the organisation of short courses, exchanges of staff, etc.
Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).
Additional eligibility criteria:

– SME-targeted collaborative projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 25% or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: Up to two projects may be funded.
Expected impact: Enhance the competitiveness and sustainability of European industries through advancing bioprocess technology. It is expected that the projects will result in accelerated process design and reduced time-to-market. Close research collaboration between relevant European industries, process development firms, end users and leading research institutions will both reinforce the scientific and/or technological excellence and the industrial relevance and economic, social and environmental potential of the research. The project will contribute to realising the objectives of environmental and industrial European policy initiatives, such as the Lead Market in Bio-based Products, the Environmental Technology Action Plan and the EU Strategy for Key Enabling Technologies.

Area 2.3.4 Biorefinery

This area addresses the development and application of industrial biotechnologies for the conversion of renewable raw materials into sustainable and cost-efficient bulk bio-products (e.g. chemicals such as lactic acid, biopolymers), and/or bio-energy. Regarding biofuels, the focus will be on the development of second generation biofuels with improved energy and environmental balance and which avoid the potential food/fuel conflict.
Aiming at achieving integrated and whole crop use of the biomass, biorefineries can use a broad range of biomass feedstocks, ranging from dedicated agricultural, aquatic, forest biomass chains to residues/waste and by-products of biomass-based industrial sectors.
Emphasis will be on the discovery, characterisation and development of novel enzymes and strains with optimised biocatalyst and microbial function for improved production of energy and bioproducts; characterisation of the structure and composition of the feedstock for optimised pre-treatment and fractionation of the biomass into its components; development of improved bio-processes with increased yield, quality and purity through bioprocess design, process optimisation and integration as well as downstream processing; fermentation science and engineering. Environmental and social aspects will also be incorporated.

KBBE.2012.3.4-01: Conversion of bio-waste in developing countries – SICA (African ACP, Mediterranean Partner Countries)

Call: FP7-KBBE-2012-6 – single stage

Agricultural, industrial and municipal biowastes are often insufficiently exploited in developing countries despite being a potential feedstock for value-added products with local applications. At the same time these biowastes can cause problems for human and animal health and the environment.
The objective of the project is to develop biotechnological processes for converting three types of biodegradable wastes, i.e. municipal, agricultural and industrial biowastes into useful bioproducts for different applications, e.g. animal feed, fertilisers and biofuels. Numerous methods exist for this type of conversion processes. Some of these available methods are quite sophisticated but others are simple and could be adapted to the local conditions found in different developing countries.
The project will therefore: 1) assess biotechnological methods adapted to the socio-economic and environmental conditions of developing countries for the conversion of biowastes (cost benefit analysis of the techniques); 2) document best practices including traditional knowledge and management strategies and opportunities offered by innovative technologies; and 3) develop novel schemes and methodologies for knowledge transfer and application, for education and training (e.g. short exchanges of staff or training workshops) and for raising awareness of options for the conversion of biowaste.
In order to ensure that the proposed processes are in line with the needs in developing countries, the project should involve local communities, international organisations and NGOs. A robust dissemination strategy involving these stakeholders will be key to maximising the long-term impact of the project.
Funding scheme: Collaborative Project (small or medium-scale focused research project) for Specific Cooperation Actions dedicated to International Cooperation partner countries.
Additional eligibility criteria:

- Minimum number of participants: 3 from different Member States or Associated countries and 3 from different ICPC from African ACP and Mediterranean Partner Countries.

Additional information: One project may be funded.
Expected impact: The project will contribute to the Millennium Development Goals by improving the management of biowastes in developing countries and thus reducing their potential adverse impacts on human and animal health, the environment and the economy. A well balanced participation of European and African partners is required to address the issues properly and produce the expected impact. It is considered that the involvement of partners from other ICPC countries should add to the expected impact of the research to be undertaken. Solutions developed in partnership between the European, African and international partners will be well adapted to local conditions.

KBBE.2012.3.4-02: Biotechnology for novel biopolymers

Call: FP7-KBBE-2012-6 – single stage

The growing market of biopolymers is evidenced by the increasing range of their applications, such as packaging, electronics, automotive, medical, and textile. The main drivers for their development are, firstly, their innovation potential for delivering similar or completely new functionalities; the reduction of dependency on fossil resources, and environmental benefits (e.g. biodegradation). Examples of biopolymers under development are polyurethanes, polyesters, polyolefins, polyamides, polysaccharides, etc.
The aim of the topic is to develop microbial and/or enzymatic pathways for the production of biopolymers. Research will cover the entire value chain from feedstock, biosynthesis of the polymer or polymer precursor, through to the optimisation of product recovery, purification and further conversion towards the final product.

Projects will have a strong industry drive and include demonstration activities to prove the techno-economic viability of the proposed value chain. Product specifications of the developed biopolymer will be optimised to match the proposed application.
Research efforts will also take into account optimising the final product's "end of life" through, for example, biodegradation or recycling. A life cycle assessment of the entire value chain should be developed.
A dissemination and exploitation plan will include a sound strategy for the effective transfer of the knowledge produced to the public and end users. The proposal will consider standardisation related activities expected to facilitate the market uptake of the developed biopolymers.
Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).
Additional eligibility criterion: SME-targeted Collaborative Projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 25% or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.
Additional information: This topic represents a major effort to support innovation in the biopolymers sector, enhance competitiveness of the European biotechnology industries and provide a considerable contribution to the Knowledge Based Bio-economy.
Expected impact: Enhance the competitiveness and innovation potential of European industries by exploiting industrial biotechnology for designing biopolymers, matching an increasing number of end-user applications. Close research collaboration between the relevant European industries, end-users and leading research institutions will facilitate the transfer of the knowledge towards industrial implementation. The project will contribute to realising the objectives of environmental and industrial European policy initiatives, such as the Lead Market Initiative in Bio-based Products, the Environmental Technology Action Plan and the EU Strategy for Key Enabling Technologies.

Area 2.3.5 Environmental biotechnology

The concept of the KBBE implies environmental sustainability which will be promoted through the development and application of modern biotechnology.
Research and development activities will provide solutions for sustainable processes and products as well as for preventing and cleaning-up pollution. This will comprise the application of biotechnologies for the design, manufacture and use of more environmentally benign products and processes as well as for applications such us bio-sensors, bio-remediation, waste treatment and recycling[22]*.*
In addition, this area will also foster the application of modern biotechnology for the understanding of microbial biodiversity and ecology (e.g. bacterial cell-cell communication). This approach will expand the understanding on systematics and will lead to the unravelling of new genes, pathways etc. with the potential to enrich several of the biosynthetic domains of biotechnology. It will also serve to the purpose of cataloguing and therefore preserving microbial diversity.

KBBE.2012.3.5-01: Innovative biotechnologies for tackling oil spill disasters (The Ocean of Tomorrow)

Call: FP7-KBBE-2012-6 – single stage

[22] Where wastes can be regarded as feedstocks for bio-processing and biorefinery they shall be dealt with in the respective Areas (2.3.3 and 2.3.4).

Accidental oil spills into the environment pose global problems and generate massive man-power and logistical demand for limiting the damage and cleaning-up terrestrial and aquatic environments. The Exxon Valdez and Gulf of Mexico accidents in 1989 and 2010 respectively have not only revealed limitations of current approaches to response management but have underpinned the urgent demand for advances in cost effective and environmentally acceptable mitigation technologies for accidental oil spills. Environmental biotechnology can provide a basis for such remediation of oil spills occurring at the source and during maritime transport.

The aim of the project is to develop improved responses to oil spills (in the ocean and coastal areas) able to tackle oil spills at the source and during transportation, based on new and innovative approaches with an emphasis on biotechnological approaches. The objectives of the topic are to a) review and analyse in depth the current knowledge in the field and to b) develop, propose and test novel, integrated approaches. In order to maximise the benefits and minimise response times in the field, multidisciplinary approaches, involving various disciplines such as engineering, chemistry, biology, marine and terrestrial ecology, marine biotechnology and the relevant industrial sectors must be considered. It is likewise necessary to consider the application of physico-chemical methods as pre-treatment technologies. The proposed technologies must be tested for effectiveness - including in field trials - and, therefore, monitoring tools and strategies will need to be developed. In situ monitoring, assessment of the treatments and their potential effects on the environment will form essential parts of the proposals. Finally, guidelines and dissemination strategies for end users are considered an integral part of the project.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

Additional eligibility criteria:

- SME-targeted collaborative projects will only be selected for funding on the condition that the EU contribution going to SME(s) is 25% or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: One project may be funded.

Expected impact: It is expected that the proposed research significantly contributes to developing economically and environmentally viable solutions, validated on the basis of field trials, for the clean-up of oil spills caused by maritime transport and oil exploration and related processes. The relevant goals of the EU Thematic Strategy on the Sustainable Use of Natural Resources will have to be addressed.

KBBE.2012.3.5-02: Biotechnological solutions for the degradation of synthetic polymeric materials (The Ocean of Tomorrow)

Call: FP7-KBBE-2012-6 – single stage

In 2008, 245 million tons of polymeric materials (mainly polyethylenes, polystyrols, polypropylenes, polyethers and polyvinylchloride) and consumer products were produced at a global level, more than 99% of which based on fossil resources. The EU alone accounts for 25% (60 million tons) of these products. More than 25 million tons of plastics are disposed of annually in EU landfills or directly into the environment, posing a huge environmental burden due to their recalcitrance towards degradation. The discovery of the Great Pacific and North Atlantic Garbage Patches and the known causal link between micro-particles of plastics and the growing number of organisms adversely affected by them, indicate the need for urgent action.

The topic aims to take stock of the current scientific know-how on the capacity of naturally occurring microorganisms for biodegrading polymeric materials, and will develop new and

innovative biotechnological approaches for reducing the growing amount of such wastes in the environment. The applicability of the new approaches will be considered and tested for relevance for reducing plastic waste in landfills and/or in terrestrial and/or aquatic environments. Selected approaches will include an assessment of the costs and potential environmental risks and benefits involved and should demonstrate their technical feasibility on the basis of field trials. Dissemination, exploitation and knowledge transfer plans will address efficient and targeted information and knowledge transfer to stakeholders and industry and also be directed to communication with the general public.

Funding scheme: Collaborative Project (small or medium-scale focused research project targeted to SMEs).

Additional eligibility criteria:

– SME-targeted collaborative projects will only be selected for funding on the condition that the EU contribution going to SME(s) is 25% or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: One project may be funded.

Expected impact: It is expected that research proposes solutions for achieving the good environmental status of the aquatic environment with regard to marine litter under the Marine Strategy Framework Directive[23]. The knowledge generated should also benefit the environmental management of terrestrial solid waste disposal.

KBBE.2012.3.5-03: Biotechnological waste water treatments and reuse in agronomical systems

Call: FP7-KBBE-2012-6 – single stage

Improving water use efficiency in face of the increased water deficit in agriculture requires a coordinated international approach with a strong commitment of all stakeholders (e.g. farmers, plant breeding industry, technology developers, etc.). The multiple issues related to water and agriculture are too often hampered by the lack of coordination and exchange of information. The treatment of water and elimination of pollutants is crucial for human health and environmental welfare. While there are a number of water cleaning methods available, the potential of biotechnology (based on plants, micro-organisms or biochemical processes) has not been yet fully exploited.

The objectives of this project are: *a)* to develop innovative biotechnological wastewater treatments for improved water recycling for agriculture; *b)* to improve water use efficiency at field level through agronomics, plant breeding and locally adapted irrigation technologies and techniques.

The European Commission and the Department of Biotechnology (DBT) of the Government of India have agreed to enhance opportunities for integrating research activities in Agriculture and Biotechnology between European and Indian teams.

On-going research activities in EU Member States and India should be taken into account with the aim of strengthening cooperation e.g. through twinning of projects in this field, training and exchange of researchers, and planning and operating of leading/cutting edge research. This cooperation is expected to boost innovation both in Europe and in India.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs).

Additional eligibility criteria:

[23] OJ L 164, 25.6.2008, p. 19

- Minimum number of participants: 3 from different Member States or Associated Countries.
- SME-targeted collaborative projects will only be selected for funding on the condition that the EU contribution going to SME(s) is 25% of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before the signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Additional information: One project may be funded. The European Commission, EU Member States and India authorities are engaged in a Pilot Initiative on water and bio-resources related challenges in the framework of the Strategic Forum for International Science and Technology Cooperation (SFIC[24]). The objective of the Pilot Initiative is to support strategic cooperation between India the EU and Member States for addressing more effectively global societal challenge in water and bio-resources related issues. The project funded under this activity constitutes an important building block of the Pilot Initiative for developing an EU and Member States strategic research and innovation agenda vis-à-vis and with India. DBT intends to support a similar project, with the same scope and in the same period. Cooperation with the Indian side project should be integrated in the proposal and will be considered in the evaluation.

Expected Impact: The project will develop applications for waste water treatments and leading to a greater integration of research actors and activities from across the European Union and the candidate countries. The project will provide a clear environmental and economic benefit optimising the use of water in agriculture and water saving. Participation of industry, including SMEs, will contribute to bring a market oriented innovation in this field in order to address the social dimension of the project. A wide co-ordination of research activities in the topic area between the EU and India, which are both major players in these fields, will contribute to step up the EU-India collaboration in scope and scale.

KBBE.2012.3.5-04: Verification of GMO risk assessment elements and review and communication of evidence collected on the biosafety of GMO

Call: FP7-KBBE-2012-6 – single stage

Specific questions about the environmental and health effects of GMOs and GM food and feed remain to be answered on a perceived lack of readily available information on environmental and health effects of already commercialised GMOs (GM crops/plants in general, GM food/feed) and on the design, execution and interpretation of results of animal feeding trials for assessing the safety of GM food and feed.

Environmental, health and socio-economic effects of the aforementioned GMOs have been the subject of scientific analysis, however a comprehensive review of national, EU and international research activities in this regard and in view of any potential benefits of GMOs is missing. Collection and review of information must take account of scientific quality and could be based on an open-access database. Linking up with already ongoing/existing activities will be considered (e.g. Scientific Committee for Agricultural Research Collaborative working group GMO, Cooperation in Science and Technology action 0905, International Centre for Genetic Engineering and Biotechnology, International Society for Biosafety Research, GM crop database of the Centre for Environmental Risk Assessment, etc.). Mechanisms to maintain the operation of the database beyond the lifetime of the project will be explored and implemented where possible.

With regard to toxicological studies based on animal feeding trials, proposals will aim to gather further knowledge on the need and design of such studies and the interpretation of the

[24] http://ec.europa.eu/research/era/areas/cooperation/international_cooperation_en.htm

results obtained and associated uncertainties. In particular the: a) need for 90-day feeding trials in all cases (single event GMOs/stacked GMOs); b) design of 90-day feeding trials on the basis of whole GM food/feed; c) added-value of extending the duration of 90-day feeding trials will be investigated. Proposals will also aim to provide scientific guidance on the biological relevance of observations made during GMO feeding trials. These animal feeding studies should cover several GMOs and should be performed in accordance with the relevant European Food Safety Authority guidance and of guidance available through other national or international bodies (e.g. Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail, OECD, Codex Alimentarius). Furthermore, account will be taken of the "three R's" principle, as anchored within the revision of EU Directive 86/609/EEC[25]. The suitability of *in-vitro* tests to replace *in-vivo* tests must be considered and tested. Studies should be carried out according to relevant quality assurance standards.
Dedicated communication programmes, targeting specific groups (scientists, policy makers, general public) will be developed. These could include e.g. a series of citizens' conferences in EU Member States, handbooks, websites, educational 'bio-kits' or other appropriate solutions. Interaction and networking with local, regional or national authorities, science organisations, NGOs and other stakeholders should be considered.
Funding scheme: Collaborative Project (large-scale integrating project).
Additional information: One project may be funded.
Expected impact: The selected project is expected to support EU risk assessors and EU policy makers by providing scientific evidence and scientific recommendations regarding the EU risk assessment process and generally on the outcome of research on the biosafety of GMOs. This is expected to increase the awareness of the evidence available regarding benefits and risks of GMOs and reduce relevant knowledge gaps, but even more importantly increase overall confidence across the Member States in the EU risk assessment and management principles of GMOs.

Area 2.3.6 Emerging trends in biotechnology

Novel technologies and new trends in biotechnology will be instrumental for the rational advancement of the KBBE. Yet, not all future trends in enabling technologies and interdisciplinary research can be foreseen. However the potentials of e.g. meta-genomics, bioinformatics, systems biology, virtual cell, synthetic biology, and nano-biotechnology have become rather concrete. These and other fields deserve appropriate measures in terms of research and development to facilitate effective transfer and implementation into industrial applications.

KBBE.2012.3.6-01: Systems Biology - ERANET

Call: FP7-ERANET-2012-RTD

Systems biology interconnects various disciplines e.g. mathematics, chemistry, physics, engineering and biology with the overarching efforts of computational modelling to better understand complex biological processes. The challenge in systems biology is to integrate research of biological systems at the sub-cellular, cellular, organ, organism and population levels, using multi-scale modelling, to allow the simulation of all physiological processes for the studied organism or population.
The aim of this ERA-NET is the concertation of multidimensional and complementary European projects and programmes on closely related topics, to help tackle complex processes of interest in microorganism, plants and animals which are of interest in the wider

[25] OJ L 358, 18.12.1986, p. 1.

area of life sciences and industrial biotechnologies e.g. pharmaceuticals, chemical, biofuels, food safety, agriculture, primary production and ecology.
Building on the existing ERA-NET, ERASysBio, this project should increase the level of coordination between European funding bodies, to continue to process and identify complementary features and synergies between the various national and European research funding instruments as well as set up the basis for future joint transnational calls and activities. Important aspects that promise to have an immediate structuring impact on the consolidation of the ERA on systems biology such as: the establishment of transnational systems biology networks; the adoption of data standards and data management best practices; the optimisation of education and training; as well as co-operation with programmes outside Europe, should be taken on board within this project.
Funding scheme: Coordination and Support Action (coordinating action).
Eligibility and evaluation criteria: please refer to Annex 4 of the Cooperation Workprogramme including the Call Fiche "FP7-ERANET-2012-RTD".
Additional information: One project may be funded.
Expected impact: This ERA-NET will increase the level of coordination between European funding bodies; seeking complementarities between national activities and pooling resources for funding and implementing research activities in a synergistic manner. This project should strengthen the position of European research on Systems Biology. The co-operation with other programmes on a global scale will help to create worldwide networks - a contribution to global communication in the field of systems biology.

IV OTHER ACTIONS[26] (*not implemented through calls for proposals)*

Monitoring and review:
Appointed independent experts will monitor and review FP-6 and FP-7 projects.
Funding scheme: Coordination and Support Action for the appointment of monitoring experts and expert-reviewers

Media activities:
Communication activities will be set in order to contribute to higher visibility and impact of EU-funded research in Food, Agriculture and Fisheries and Biotechnology as well as the international recognition of Europe's achievements and potential in research relevant for the Bio-Economy.
These activities will particularly focus on the bio-economy concept, the role of the Knowledge-Based Bio-Economy in a society facing numerous challenges and the importance of innovation. Specific activities (as writing of press articles, media events, workshops, etc.) should be organised to communicate results to media and multipliers for addressing the general public. Young people and their educational needs should be also targeted.
Funding scheme: public procurement: use of framework contracts or open call for tender (depending on the availability of framework contracts)
Estimated publication date: first half of 2012.

Science communication and support to Policies:
Communication activities will be set in order to increase the added value and impact of innovation aspects of EU-funded research in Food, Agriculture and Fisheries and Biotechnology. Moreover, scientific support to "policies DGs" on the Bio-Economy will be highlighted and, in that respect, close links will be establish with relevant community policies as well as European national and international policy and regulatory actors. The international dimension will also be taken into account.
Specific activities as events at EU, national and regional levels should be organised to engage stakeholders, including Members of the European Parliament as well as national parliaments' members in a interactive debate how to unlock the potential of the Bio-Economy sectors through research, education and innovation for the promotion of more growth and employment.
Funding scheme: public procurement: use of framework contracts or open call for tender (depending on the availability of framework contracts)
Estimated publication date: first half of 2012.

[26] In accordance with Articles 14, 17 and 27 of Regulation (EC) No 1906/2006 of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013).

Conferences/events:

Agricultural Knowledge and Innovation Systems Conference: A stakeholder conference will be organised to disseminate the findings and reflect upon the long-term research needs from the SCAR Agricultural Knowledge and Innovation Systems group.
Funding scheme: public procurement: use of framework contracts or open call for tender (depending on the availability of framework contracts)
Estimated date: 2012.

Low-Input and Organic Agriculture Research Projects: A stakeholder conference will be organised to disseminate and discuss the publication of research projects and results.
Funding scheme: public procurement: use of framework contracts or open call for tender (depending on the availability of framework contracts)
Estimated date: 2012.

Groups of independent experts:
An Expert Group will be created to explore options for the setting up of a Public Private Partnership initiative in bio-based industries taking account of the upcoming communication on the Knowledge-Based Bio-Economy and the proposal for a Common Strategic Framework which are expected to be adopted before the end of 2011. The task of the Expert Group will be to collect and analyse information, explore the issues, assess policy and operational options, and assist the preparation of an ex ante impact assessment. The Expert Group will facilitate interaction between all stakeholders concerned, including universities, research organisations, industry and public authorities.
Funding scheme: Coordination and Support Action relating to the appointment of independent experts.