

WORK PROGRAMME 2009

COOPERATION

THEME 2

FOOD, AGRICULTURE AND FISHERIES, AND BIOTECHNOLOGY

(European Commission C(2008)4598 of 28 August 2008)

Contents – Theme 2: Food, Agriculture and Fisheries, and Biotechnology

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Theme 2: Food, Agriculture and Fisheries, and Biotechnology

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 coupled with the 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 agriculture, aquaculture and fisheries; and the increasing demand for food production to take into account animal welfare and rural and coastal contexts and to respond to the specific dietary needs of consumers.

I. CONTEXT

Approach for 2009

In 2009, Theme 2 ‘Food, Agriculture and Fisheries, and Biotechnology’ continues to focus on the opportunities and challenges associated with the development of the European Knowledge Based Bio-Economy (KBBE). These challenges include taking into account the rapid transformation of the agricultural, food and biotechnology sectors while supporting and generating sustainable growth and employment in Europe and at the same time opening up to other countries. They also include coping with major interlinked trends affecting the bio-economy: climate change and mitigation of its effects, greater focus on environmental considerations, finding alternatives to fossil oil (energy and chemicals), feeding an increasing world population, health and food issues, globalisation, CAP reform, maritime policy, and changes in the rural economy. These challenges are extensively addressed in many current high-profile Community policies and strategies².

The 2009 work programme continues to create the conditions for building a critical mass in the new areas introduced in 7th Framework Programme (FP7), such as: enabling technologies; forestry and integrated biorefineries; marine and environmental biotechnology; agriculture/food and climate change; convergent technologies; and non-food research. Other areas to be addressed in 2009 are those where recent efforts have been made and in which the EU is strong but needs further strengthening (such as nutrigenomics, industrial biotechnology, fisheries and aquaculture), and those where the EU is lagging behind compared to our competitors (such as synthetic biology, robotics, farm-level informatics). In addition, European added-value has been a crucial element in setting the priorities for the 2009 work programme.

Under the 2009 work programme, the structuring of ERA will be enhanced through specific actions (e.g. ‘Enhanced cooperation in food and health towards strengthening the ERA’;

¹ The term ‘bio-economy’ includes all industries and economic sectors that produce, manage or otherwise exploit biological resources (and related services, supply or consumer industries), such as agriculture, food, fisheries and other marine resources, forestry, etc.

² In particular: the Renewed Sustainable Development Strategy; the Maritime Policy; the Strategic Energy Technology Plan; the Green Paper on adaptation to climate change; the White Paper on ‘A strategy for Europe on nutrition, overweight and obesity-related health issues’; the Aquaculture Strategy; the Organic Farming Action Plan; the Forestry Action Plan; the CAP Health Check; the Community Animal Health Policy and Animal Welfare Plan; the Water Initiative; the European Consensus for Development; the EU-Africa Strategic Partnership.

support for a common understanding of the concept of 'Food chain transparency' at EU level; and research on 'Novel marine bioactive compounds for European industries'). Furthermore, two new ERANETs are proposed on (i) Organic agriculture and (ii) Agriculture research for development.

In addition, the ERA will be developed further by strengthening the partnership between the EU and the Member States, in particular through a more strategic and better structured approach to future joint programming actions at EU level. To this end, the Standing Committee on Agricultural Research (SCAR) and KBBE-NET have already initiated or are developing a range of activities to help build a European Research Area for agriculture, food and biotechnology. These provide strategic input to research priority setting and increasingly the formulation of topics. With the long-term needs of European research in mind, SCAR has also initiated a foresight process, has provided expert input for the mapping of agricultural research capacity in Europe, and is performing an assessment of Europe's research infrastructure needs.

- **SME-relevant research:** In 2009, the work programme for Theme 2 continues to encourage the involvement of industrial participants, in particular SMEs. The participants include: end-users of new technologies (such as breeding companies, SMEs or agricultural cooperatives involved in the production, packaging or control of food or feed, etc.), technology providers (mainly engineering companies), and technology-based biotechnology companies (agricultural or industrial biotechnology). SMEs are expected to be involved in all relevant research dealing with the concrete industrial application of new technologies or research results as well as in the development of industrially relevant technologies.
- **Socio-economic research:** Ethical, social, economic and wider cultural aspects are fully integrated within projects by encouraging the participation of experts in ethics, law, economics and the social sciences. In 2009, specific socio-economic research activities will also be supported, e.g. 'Transparency along the food value chain' and 'Analysis of the ethical, safety, regulatory and socioeconomic aspects of nanobiotechnology'.
- **International cooperation:** International cooperation with participants from third countries is supported and encouraged throughout all areas of Theme 2 in work programme 2009, and all topics are open to cooperation with third countries.

In addition, a series of '*Specific International Cooperation Actions*' (SICA) are dedicated to international cooperation with *International Cooperation Partner Countries* (ICPC) — see Annex 1 — to jointly address, on the basis of mutual benefit, issues of shared interest, problems facing third countries and challenges of a global character, including meeting the Millennium Development Goals (e.g. conservation agriculture, the impact of globalisation and trade on developing countries, and traditional knowledge and foods). Africa is targeted as a priority in 2009.

In order to help international partners identify relevant topics, a list of Specific International Co-operation Actions (SICA) and other topics with mandatory International Cooperation Partner Countries (ICPC) covered by 2009 work programme is provided at the end of this introduction.

In addition to the SICA topics, several other topics have been specifically highlighted as being research areas which are particularly well suited for international cooperation. For these topics, the active participation of a relevant third country partner or partners should add to the

scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken. These aspects will be considered specifically during the evaluation of all topics concerned by international cooperation.

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 United States, Canada, Australia, New Zealand, etc, a Community financial contribution may be granted provided that it is essential for carrying out the indirect action.³

Further specific activities with third countries that have signed bilateral science and technology (S&T) agreements with the European Community will include i) a coordinated call with India (Department of Biotechnology, Government of India) and ii) the twinning of projects under this theme and related programmes in third countries, e.g. Agriculture and Agri-Food in Canada.

Twinning of projects under Theme 2 and related programmes in third countries: with a view to promoting international cooperation with third countries that have signed bilateral S&T agreements with the European Community, initiatives for collaboration between projects under Theme 2 of FP7 and related research programmes in these third countries will be encouraged on the basis of mutual benefit and reciprocity. The Commission reserves the right to ask the coordinators of FP7 projects, during the contract negotiations, to include collaboration activities with projects that are financed by these third countries. The costs of these activities are expected to be approximately 1% of the total European Community contribution to these projects. Parallel funding is expected from the related research programmes in the third countries for counterpart projects. As an example, twinning with Canadian projects run by Agriculture and Agri-food Canada could be supported, in this way.

Coordinated Call with India (Department of Biotechnology – DBT): Under the umbrella of the EU-India S&T Cooperation Agreement, a coordinated call will be implemented with the Department of Biotechnology (DBT) of the Government of India, in order to jointly address objectives of mutual interest via coordinated and tightly linked projects respectively from the EU (FP7) and India (DBT), under the Activity 2.2: Fork to Farm: Food (including Seafood), Health and Well-Being.

• **Cross-thematic approaches:** Two areas have been identified as relevant for coordination of topics in 2009:

- **Coordinated topics on marine and maritime sciences** (with the Themes 'Energy' and 'Environment') with a view of promoting a 'Sustainable use of the Seas and Oceans'. The following topics will be covered:

Theme 2- 'Food, Agriculture and Fisheries, and Biotechnology': Integration of aquaculture and fisheries in the coastal zone; Importance of foraging fish in the ecosystem; Biomass from micro- and macro-algae for industrial applications;

³ For more information please refer to the Rules for Participation under FP7, article 29

Theme 5- 'Energy': Deep off-shore multi-purpose renewable energy conversion platforms for wind/ocean energy conversion; Coordination action on off-shore renewable energy conversion platforms; Algal and other suitable non-food aquatic biomass feedstock for 2nd generation biofuel production;

Theme 6- 'Environment': Options for ecosystem based management; Towards integrated European marine research strategy and programmes; Support to "Maritime Partnership"; Integrated coastal zone management; Climate change impacts on the marine environment: research results and public perception.

- **Coordinated topics on nanobiotechnology** (with the Theme 'Nanosciences, Nanotechnologies, Materials and new Production Technologies'):

Theme 2- "Food, Agriculture and Fisheries, and Biotechnology": Nanobiotechnology: smart devices to study biomolecule dynamics in real time; Nanobiotechnology: functionalised membranes; Nanobiotechnology: bio-interfaces for environmental applications; Nanobiotechnology: analysis of the ethical, safety, regulatory and socioeconomic aspects;

Theme 4 – 'Nanosciences, Nanotechnologies, Materials and new Production Technologies ': Applying life science principles as model for new nanotechnology-based mechanisms, processes, devices and/or systems.

- **Joint call on biorefinery** (with the Themes 'Energy', 'Environment' and 'Nanosciences, Nanotechnologies, Materials and new Production Technologies) will be implemented in 2009 work programme.

- **Promoting effective communication and dissemination:** In 2009, a number of topics specifically address knowledge transfer, dissemination and communication activities to engage the public in participation and dialogue (i.e. topic on benefit/risk perception and communication in the food chain). The 2009 work programme encourages the participation of civil society organisations in all topics. Furthermore, innovation-related aspects will be clearly addressed within each project and well-defined dissemination and exploitation plans presented. These plans should include whenever appropriate to communicate the research results to the managing authorities of the Cohesion Policy funds⁴, the European Fisheries Fund⁵ and the European Agricultural Fund for Rural Development⁶.

- **Use of animals in research:** Research activities should take into account the Protocol on the Protection and Welfare of Animals and reduce the use of animals in research and testing, with a view ultimately to replacing animal use (Decision 1982/2006/EC). The 3Rs (Replacement, Reduction and Refinement) principle should be applied in all research funded by the European Commission.

- **Theme-specific information:** Activities 2.1, 2.2 and 2.3, and all areas within these activities, will be open in the 2009 Call (Call 3). In Call 3 the majority of topics are (i) 'Collaborative Projects (small- or medium-scale focused research actions)' and (ii) 'Coordination and Support Actions'. A smaller number of 'Collaborative projects (large-scale

⁴ http://ec.europa.eu/regional_policy/atlas2007/fiche_index_en.htm

⁵ http://ec.europa.eu/fisheries/cfp/structural_measures/arrangements_2007_2013_en.htm

⁶ http://ec.europa.eu/agriculture/rurdev/index_en.htm

integrating projects)' will also be funded. All proposals will be evaluated under a single stage procedure except those submitted to the topic KBBE-2009-3-7-01 of the Biorefinery Joint Call. ERA-NET topics⁷ will be included in a common ERA-NET call.

Collaborative Projects (small- or medium-scale focused research actions) are projects with a requested Commission contribution of up to EUR 3 000 000⁸, Coordination and Support Actions (CSA) up to EUR 1 000 000, and Collaborative Projects (large scale integrating projects) up to EUR 6 000 000, unless stated otherwise for a given topic in the work programme⁹.

It is important to note that these funding thresholds will be applied as eligibility criteria and that proposals not meeting these thresholds will be considered ineligible.

For the Biorefinery Joint Call (topics KBBE-2009-3-7-01 and KBBE-2009-3-7-02), no upper funding thresholds will apply, neither for the Collaborative Project proposals nor for the Coordination and Support Action proposals.

For the Call of this work programme, only one ranked proposal will be retained per topic to ensure maximum coverage of topics, unless otherwise indicated. However, there may be competition between topics, so some topics may not be covered, i.e. in cases where proposals pass the ranking threshold but remain below the funding threshold.

List of Specific International Cooperation Actions and other topics relevant to international cooperation

1) Specific International Co-operation Actions (SICA) and other funding schemes with mandatory International Cooperation Partner Countries (ICPC) participation

| <i>Topic number</i> | <i>Full Title</i> | <i>Funding Scheme</i> ¹⁰ | <i>Third Countries/Region (Mandatory)</i> |
|----------------------------|--|--|---|
| KBBE-2009-1-1-03 | Optimisation of methods to maintain farm animal biodiversity | CP-FP-SICA | 2 ICPC among which 1 from African ACP countries (see Annex 1) |

⁷ KBBE-2009-1-4-08: Agricultural Research for Development – ERA-NET; KBBE-2009-1-4-09: Organic agriculture – ERA-NET. For further information on the ERA-NET call please see Annex 4 of the Cooperation Work Programme.

⁸ In general, projects providing policy support through a study-type approach will be significantly less than this — applicants should refer to the call 'fiche' for the eligibility criteria.

⁹ The following topics have a maximum contribution of EUR 2 000 000: KBBE-2009-1-4-02: Spatial analysis of rural development measures for effective targeting of rural development policies; KBBE-2009-1-4-04: Comparative analysis of factor markets for agriculture across the Member States; KBBE-2009-1-4-05: Policy and institutional aspects of sustainable agriculture, forestry and rural development in the Mediterranean partner countries — SICA (Mediterranean Partner Countries).

The following topics have a maximum contribution of EUR 1 500 000: KBBE-2009-2-7-01: Development of functional foods and ingredients; KBBE-2009-2-7-02: Valorisation of by-products in food processing.

¹⁰ CP-FP- SICA: Collaborative Project (small or medium-scale focused research project) for Specific Cooperation Actions Dedicated to International Cooperation;
CP-IP-SICA: Collaborative Project (large scale integrating project) for Specific Cooperation Actions Dedicated to International Cooperation;
CSA-CA: Coordination and Support action (coordinating action);
CSA-SA: Coordination and Support action (supporting action).

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| KBBE-2009-1-2-03 | Irrigation water saving solutions for Mediterranean agriculture | CP-FP-SICA | 2 ICPC from the Mediterranean Partner Countries (see Annex 1) |
| KBBE-2009-1-2-08 | Assessing and reducing vulnerability of European forests to climate change and the consequences for industrial and societal needs | CP-FP-SICA | 2 ICPC among which Russia (in addition but non-mandatory also United States or Canada) |
| KBBE-2009-1-2-09 | Impact and development of Conservation Agriculture techniques in developing countries | CSA-SA | 2 ICPC from African ACP countries (see Annex 1) |
| KBBE-2009-1-3-01 | Porcine reproductive and respiratory syndrome (PRRS): new generation, efficient and safe vaccine, new control strategies | CP-FP-SICA | 2 ICPC, among which 1 from China and 1 from the South East Asia (Indonesia, Malaysia, Philippines, Thailand, Vietnam, Lao People's Democratic Republic, Myanmar and Cambodia) |
| KBBE-2009-1-3-04 | Tick borne diseases. Improvement of current vaccine and development of new vaccines for theileriosis and babesiosis through exploitation of genomic data | CP-FP-SICA | 2 ICPC among which 1 from China and 1 from the Central Asia (Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan and Turkmenistan) |
| KBBE-2009-1-4-05 | Policy and institutional aspects of sustainable agriculture, forestry and rural development in the Mediterranean partner countries | CP-FP-SICA | 2 ICPC from the Mediterranean Partner Countries (see Annex 1) |
| KBBE-2009-1-4-06 | Agricultural innovation systems and traditional knowledge | CSA-SA | 2 ICPC from African ACP countries (see Annex 1) |
| KBBE-2009-1-4-07 | Globalisation and trade impact on developing countries | CSA-SA | 2 ICPC from African ACP countries (see Annex 1) |
| KBBE-2009-1-4-10 | Consolidate alliances with Asia in the field of aquaculture | CSA-CA | 2 ICPC from Asia (see Annex 1), among which China |
| KBBE-2009-1-4-11 | Consolidate alliances with the Mediterranean in the field of aquaculture | CSA-CA | 2 ICPC from the Mediterranean Partner Countries (see Annex 1) |
| KBBE-2009-2-3-02 | Sharing food technology research and development | CP-FP-SICA | 3 ICPC |

| | | | |
|------------------|---|---|---|
| | by means of international collaboration | | |
| KBBE-2009-2-4-02 | Risk-benefit assessment of food supplements | CP-IP-SICA | 2 ICPC |
| KBBE-2009-2-5-01 | International food trade: Anticipating the impact of climate change on the safety of European and global food markets | CP-IP-SICA | 3 ICPC |
| KBBE-2009-2-7-01 | Development of functional foods and ingredients | CP- FP Coordinated with Indian project | Coordinated call with India -DBT |
| KBBE-2009-2-7-02 | Valorisation of by-products in food processing | CP-FP Coordinated with Indian project | Coordinated call with India - DBT |
| KBBE-2009-3-1-02 | Jatropha curcas – breeding strategy – towards a sustainable crop for biomaterials and biofuels | CP-FP-SICA | 3 ICPC from India and/or African ACP countries and/or Latin America (see Annex 1) |
| KBBE-2009-3-4-01 | Biomass and bioproducts: sustainability certification and socioeconomic implications | CSA-CA | 3 ICPC from Latin America and/or African ACP countries and/or Asia (see Annex1) (in addition but non-mandatory also United States and Canada) |
| KBBE-2009-3-4-02 | Biomass pre-treatment for optimised biomass deconstruction and analytical characterisation | CP-FP-SICA | 2 from Brazil |

2) Other topics particularly well suited for international cooperation

| <i>Topic number</i> | <i>Full Title</i> | <i>Funding Scheme</i> ¹¹ | <i>Third Countries</i> |
|---------------------|--|-------------------------------------|-------------------------------------|
| KBBE-2009-1-1-02 | Mining genomics information of small ruminants to generate new information on the genetic basis of phenotypes important to sustainable production and health | CP-FP | United States |
| KBBE-2009-1-2-04 | Improving performance and quality of crops in the context of organic and low-input systems by breeding and management | CP-IP | African ACP countries (see Annex 1) |

¹¹ CP-FP: Collaborative Project (small or medium-scale focused research project);
 CP-IP: Collaborative Project (large scale integrating project);
 CSA-CA: Coordination and Support action (coordinating action);
 CSA-SA: Coordination and Support action (supporting action).

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| KBBE-2009-1-2-13 | From capture based to self-sustained aquaculture | CP-FP | ICPC |
| KBBE-2009-1-3-02 | Diseases caused by Orbiviruses: African horse sickness, bluetongue and epizootic haemorrhagic disease: development of new generation vaccines and accompanying tests | CP-FP | Third Countries |
| KBBE-2009-2-4-01 | Analytical tools for the characterisation of nano-particles in the food matrix | CP-FP | United States, Canada |
| KBBE-2009-3-1-03 | Abiotic stress tolerance: biotechnological applications from lab to the field | CSA-SA | United States |
| KBBE-2009-3-1-04 | Prospecting for novel plant-produced compounds | CP-FP | ICPC |
| KBBE-2009-3-2-01 | Novel marine bioactive compounds for European industries | CP-IP | ICPC |
| KBBE-2009-3-2-02 | Sustainable use of seas and oceans - Biomass from micro- and macro-algae for industrial applications | CP-FP | ICPC |
| KBBE-2009-3-6-01 | Nanobiotechnology: smart devices to study biomolecule dynamics in real time | CP-FP | United States |
| KBBE-2009-3-6-03 | Nanobiotechnology: bio-interfaces for environmental applications | CP-FP | United States |

II. CONTENT OF CALLS

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-2009-1-1-01: Integration of tools to support a system-based understanding of complex biological processes

Call: FP7-KBBE-2009-3

The project will apply a systems level approach, integrating wet biology with the use of high-throughput, computational and modelling tools to improve our understanding of how multiple genes function in concert to effect key processes in plant development and environmental interactions. More specifically, it will contribute to deciphering the logic of regulatory control of a specific, physiological/developmental process in plants in interaction with the environment at various levels such as transcriptional, post-transcriptional, translational and post-translational. Data generated by high-throughput technologies on specific aspects of developmental control and environmental responses will be functionally analysed and fed into innovative programming and modelling tools to provide a systems-based understanding of regulatory networks.

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

Additional information: Project consortia shall be clearly multi-disciplinary and complementary and shall properly demonstrate their capacity to integrate biological data obtained at various levels of regulatory control into computational and modelling tools.

Expected Impact: European added value lies in the pooling of interdisciplinary research expertise, thus creating economies of scale as regards European research capacity in a complex and resource intensive scientific area. Project results are expected to increase our knowledge of the function of regulatory networks and advance our conceptual understanding of global regulatory control of plant development and environmental response. The development of tools and resources for systems analysis will support the integration of experimental data. At a more applied level it is expected that the project will make significant progress in the identification of factors controlling key traits which will be of value to European plant breeding efforts to improve plant performance, yield, and quality in the field.

KBBE-2009-1-1-02: Mining genomics information of small ruminants to generate understanding of the genetic basis of phenotypes important to sustainable production and health

Call: FP7-KBBE-2009-3

Small ruminant production is important across different and often 'marginal' habitats but small ruminants are often considered as 'orphan species', where research on genomics and related science lags behind other species. This project will use functional and comparative genomics and, where applicable, *in silico* analysis, genome sequencing and other tools, to dissect the genetic basis of one or more specified traits related to production and health. The purpose of this project is to assist in the exploitation of the genome sequence by providing analysis of the genome in relation to traits important for health and sustainable production.

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

Additional information: It is viewed that the active participation of relevant partners from United States should add to the scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken; this will be considered by the evaluators.

Expected impact: The European and added value lies in the pooling of interdisciplinary research expertise, thus creating economies of scale as regards research capacity in a complex and resource intensive scientific area. The project will contribute to improving the efficiency, profitability and sustainability of small ruminant production while supporting animal health policy and the long term competitiveness of livestock production. The project will exploit

genomics information for the production of small ruminants and develop a knowledge base in an area critical for public policy.

KBBE-2009-1-1-03: Optimisation of methods to maintain farm animal biodiversity – SICA (African ACP)

Call: FP7-KBBE-2009-3

New high-throughput and low cost genomic tools open up new prospects for the measurement, conservation and exploitation of biodiversity in farm animal species, including their wild ancestors, when relevant. These tools have the potential to supplement or replace current quantitative methods for the management and definition of optimal biodiversity in farm animal breeding programmes in both cosmopolitan and local breeds and to inform and develop strategies to provide for cost-effective *in vivo* or *in vitro* conservation of endangered genetic resources. In addition they can unravel the genetic basis of adaptation to different environments, a key trait for successful breeding in a scenario of rapid climate change. The project will encompass development of methodologies, tools and models to assist both industry and policy makers and may include work on improved bio-banking technologies. The project has an international dimension, to support efforts in countries with local breeds and extensive farming, in particular Africa (breeds resistant to vector borne diseases; pastoralist agriculture). The projects should include a training component with the aim to increase the research capacities in the participating developing countries. This could include, for example, participation in training programmes, short exchanges of staff, training workshops.

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

Additional eligibility criteria: SICA – minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC among which 1 from African ACP countries.

Expected impact: The European and international added value lies in mutual knowledge generation, enhanced collaboration between different scientific disciplines and in capability-building. The project will offer new perspectives for assessing, conserving and exploiting animal biodiversity in livestock farming systems, taking into account the variability of (national) breeds that will inform evidence based decision making on conservation policy across the EU and further. The project will contribute to an improvement of breeding programme design and provide new tools for industry to optimally manage biodiversity in commercial populations. Thus, the project will address and add value to the global issue of genetic resources management.

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-2009-1-2-01: Legumes: key multifunctional legume crops for an energy-efficient and environmentally friendly future European agriculture

Call: FP7-KBBE-2009-3

The project will design novel cropping systems that optimise the contribution of legumes to the system as a whole, embracing forage, pastures and legume arable crops. On the basis of case studies, the project will take full consideration of the variety of agro-economic and pedo-climatic situations in Europe and will also consider how to optimise links between areas of production and areas of uses.

Beyond its traditional uses (forage, pastures, food) the value of legumes as biofuels, green chemicals and new materials will be looked at in coordination with other research projects dealing with non-food crops, particularly FP6 and FP7 projects.

Within the context of climate change and sustainability in a broad sense, the role of legumes in the carbon and nitrogen cycles will be studied as well as nitrous oxide emissions and other N loss pathways such as nitrate leaching from a range of cropping systems and rotation schemes. The other ecological services and risks of legumes will also be assessed (soil fertility, impact on epidemiology of plant pests and pathogens in crop rotations, biodiversity, etc.).

The most adapted genetic material will be screened and assessed for relevance to the novel roles of such systems while ensuring stable and improved yields as well as quality and digestibility of proteins when relevant. This agricultural science-based study will also have a strong socio-economic (e.g. quantifying direct and indirect costs and benefits for crop rotations) and policy dimension and will promote awareness and cooperation as well as knowledge and technology transfer between farm, industry, society, and policy-makers.

Within a minor proportion of the total effort, the project may also contribute to maintain, organise, coordinate, pool and enrich knowledge, technologies and other resources on legumes (databases, collections) while simultaneously facilitating access to these resources for exploitation by interested parties.

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

Expected impact: The major objective of the project will be to enhance novel cropping systems that promote the sustainable and beneficial use of legumes in European farming systems. Thanks to their unique capacity for fixing atmospheric nitrogen, legumes meet two

major challenges in European agriculture: (i) reduced fossil energy use and greenhouse gas emissions; (ii) diversification and sustainability (reduced losses and optimised use of pesticides and fertilisers). In addition to being a valuable animal feed with human health benefits, legumes are also interesting sources of biomass and bioenergy. As a consequence future agro-systems with more forage and grain legumes could offer enhanced ecological services and contribute to addressing global issues, such as sustainability and agricultural competitiveness while decreasing their environmental footprint.

KBBE-2009-1-2-02: Multifunctional grasslands for sustainable and competitive ruminant production systems and the delivery of ecosystem services

Call: FP7-KBBE-2009-3

Grasslands cover about 50% of the European farmed landscape. They are an essential element of sustainable farming systems: animal welfare, forage and grazing, soil quality, and optimum use of low productive agricultural land. In addition grasslands play an essential role in the environment and rural development: carbon sequestration in soils, open landscapes, biodiversity, soil stability and prevention of floods, cultural heritage, and water purification.

To support developments and innovations in grassland use and management in different farming systems (including low-input and organic), pedo-climatic and socio-economic conditions encountered in Europe the project will address i) roles and utility of grassland at the catchment and landscape levels from economic, agronomic and environmental points of view, ii) ways of optimising these roles including sustainable/profitable ruminant production systems, better management practices and techniques, adapted plant species, varieties, genetic material, grassland vegetation dynamics, farm animal (ruminant) species grazing and herd management etc., and iii) the spatial localisation of grasslands within landscapes or catchments, and spatial and temporal interactions between grasslands, arable crops and other elements of the landscape. This multi-scale approach is new compared to field or farm-based studies and will better address the multifunctionality aspect of grasslands.

This agricultural science-based study will also have a strong socio-economic and policy dimension and will promote awareness and cooperation, knowledge and technology transfer between farm, industry and society and policy-makers, as well as market-driven initiatives. The complex interactions between grassland and grassland-based systems and greenhouse gases emissions and carbon sequestration will be an integral part of this project.

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

Expected impact: The European added value will come from securing optimal European grassland acreages, reinforcing the competitiveness and environmental benefits of grassland-based animal production, and thus addressing issues of European and global interest, i.e. environment protection and sustainable agriculture. It will provide knowledge, models, tools and resources for validating and promoting positive externalities and best use of grasslands in different ruminant production systems (e.g. high input, low input, organic farming).

KBBE-2009-1-2-03: Irrigation water saving solutions for Mediterranean agriculture – SICA (Mediterranean Partner Countries)

Call: FP7-KBBE-2009-3

Irrigation water demand is increasing in Mediterranean countries, putting more pressure on the available fresh water reserves. The project will address issues related to the sustainable use of water in Mediterranean irrigated agricultural systems, with the aim of reducing water use and reversing the current unsustainable trend. The research focus should be on cost-

effective innovative and more efficient techniques allowing substantial savings in terms of consumption and waste, and improving water productivity. The best water-saving solutions should be integrated within suitable husbandry practices and tailored to the most water-demanding crops currently grown in the project target areas, thus improving the whole system performance. The project should also include the study and development of new models of good governance at basin or catchments level, and should define strategies and propose policies aimed at promoting a more responsible and efficient use of irrigation water at farm level. In this respect, a participatory approach is recommended, as well as the planning of an effective communication and demonstration strategy to facilitate an adequate involvement of stakeholders. The dissemination plan should include a sound strategy for an effective transfer of the produced knowledge towards the end-users, e.g. industry, SMEs and farmers.

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

Additional eligibility criteria: SICA - Minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC from the Mediterranean Partner Countries.

Expected impact: The European and international added value lies in mutual knowledge generation and in capability-building and increased trade opportunities for European and ICPC companies. The project will contribute to the reduction of irrigation water use through the development of innovative, more efficient and water-saving irrigation systems, technologies and techniques. Thus the project will address and add value to the global issue of natural resource management.

KBBE-2009-1-2-04: Improving performance and quality of crops in the context of organic and low-input systems by breeding and management

Call: FP7-KBBE-2009-3

The project will analyse, compare and improve different breeding and crop management approaches to obtain specific traits required in organic and low input systems. The main objectives should be to obtain high nutritional and organoleptic quality, pest and disease resistance, competitiveness against weeds, nutrient use efficiency, stable and acceptable yields, and tolerance to abiotic stress, in genetic material and to improve productivity and quality of organic agriculture. Breeding approaches developed and/or tested in this project should make use of the genetic diversity of crops and take into account modern breeding tools such as molecular methods (for instance DNA-marker assisted selection). Testing of plant material shall be undertaken in different agro-climatic conditions. Thus, a diversity of geographical situations should be considered to best adapt genotypes to environment. Crop management approaches should cover a wide range of aspects relevant for organic/low-input farming (e.g. soil fertility, plant protection, husbandry practices etc.). The work shall address at least one species in each of the following plant groups: (i) cereals, (ii) grain legumes and (iii) vegetables in different farming systems and climatic conditions. In order to ensure sustainability and field applicability of the results, socio-economic aspects should also be considered.

Funding scheme: Collaborative Project (large scale integrating project)

Additional information: Improving the sustainability of low-inputs systems in the context of small-scale farming in developing countries is crucial, especially in the African ACP countries. Therefore, the project should ensure dissemination and transfer of the results concerning breeding technologies and strategies to those countries. It is viewed that the active participation of relevant developing countries especially the African ACP countries should

provide for an increased impact of the research to be undertaken through transfer of knowledge; this will be considered by the evaluators.

The active participation of SMEs is encouraged in view of the implementation of the project results; this will be considered by the evaluators.

Expected impact: This project will deliver improved tools for the development of the quality and performance of crops adapted to organic and low-input systems. By doing so, it will support the EU policy on organic and low input farming and contribute to strengthening the competitiveness of the European organic farming sector. Dissemination and transfer of results to low-input small-scale agricultural sector in Sub-Saharan Africa shall support European efforts in achieving the Millennium Development Goals.

KBBE-2009-1-2-05: Water stress tolerance and water use efficiency in food crops

Call: FP7-KBBE-2009-3

Recent climate change scenarios predict higher variability of rainfall in space and time. This increased heterogeneity in water availability will significantly affect European agriculture, creating considerable water and osmotic stress on crop plants. Yield stability and productivity will depend highly upon the ability to develop varieties and cropping systems that are better adapted to water stress.

The selected project will extend and translate existing molecular, biochemical and physiological knowledge of the processes involved in (i) tolerance and adaptation to water and osmotic stress and (ii) water-use efficiency, to provide tools for the development of crops (excluding shrubs and trees) which can better cope with the effects of variable and in particular limited water supply. Tools can include the application of molecular markers for water stress, candidate gene approach, or the development and validation of novel screens for phenotypic and genetic analyses. The project should explore the natural variation of key productivity traits of plants in response to water and osmotic stress.

The project must justify the choice of crop(s) to be studied taking into account its current and/or future relevance for agriculture in Europe (including at regional scale), the scope of the proposed work and the selection of partners (within and outside Europe including ICPC countries). Significant attention shall be paid to the dissemination of results.

Funding Scheme: Collaborative Project (large scale integrating project)

Expected impact: Project results will increase knowledge of the physiology and genetic controls of plant responses to water stress, and on mechanisms for increased water use efficiency. It should also make a significant contribution to translating results from the laboratory to the field and to supporting crop improvement strategies for the development of stress-proof cultivars. At a wider scale project results shall contribute to adapting European agriculture to forecasted climatic challenges and to adding value to the efficient use of water resources.

KBBE-2009-1-2-06: Developing new methods for valuing and marketing currently non-marketable forest functions, goods and services

Call: FP7-KBBE-2009-3

The project will develop new valuation methods able to assess in an integrated way the socio-economic impact of a wide range of forest externalities (like recreation, protection of water and soil, CO₂ sequestration and others), and to propose adequate market-based methods to enhance their provision. These methods and concepts will address the changes in forestry production in various parts of Europe where goods, benefits and services such as clean water and air, carbon sequestration, biological diversity, recreation, hazard protection and prevention, landscape, etc. are becoming more important as forest products and services.

There is, however, a lack of economic quantifications assessing in an integrated way the value of these services, including the transboundary effects. Case studies assessing the expected costs and benefits regarding local and regional differences across Europe should be included in the project.

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

Expected impact: The project will help develop a viable income from forests, and add value to sustainable rural development practices. It will provide methods and models for the valuation and enhanced provision of several forest externalities and give best practice examples as well as guidelines to policy makers for implementing such methods and models.

KBBE-2009-1-2-07: Meeting industrial requirements on wood raw-materials quality and quantity

Call: FP7-KBBE-2009-3

To increase wood value and productivity, better information of the wood raw material quality and quantity, combined with novel logistic concepts that integrate transport systems and management models throughout the wood raw-materials production and supply chain, are needed. Longer-term policy decisions require information about the possibilities to manipulate the available resources through forest management, species selection and genetic improvement. Methods to meet the market-based and changing quality and quantity requirements of manufacturing industries need to be developed by integrating industrial production planning with forest management and inventory and transport operations. Novel quality and quantity assessment techniques including remote sensing and modelling, on trees in the forest and on wood at the mill, will facilitate the economic and environmental allocation of raw materials to different industrial applications. Research should in turn demonstrate the economic and environmental benefits of tailor-made wood production and supply chains to forest owners, wood and fibre manufacturing industries as well as energy converging operations.

Main development issues and targets are:

- Mapping of existing forest resources with respect to tree species quantity, dimensions, quality and specific properties using field measurements, geographic information systems and novel remote sensing techniques.
- Analysing wood properties and how they are affected by management regimes under different environmental conditions, for assessing the future potential distribution of wood properties from different sources.
- Development of new and improvement of existing techniques for non-destructive and non-touching measuring and modelling methods for assessment of stem and round-wood properties.
- Development of logistic and decision support systems for optimised wood production and supply chain management, optimising transport operations for delivery of tailor-made raw materials to satisfy customer specifications.

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

Expected impact: Impacts could include improved integration and efficiency along the value chains, increased capital turnover and profitability, etc. The project will contribute to improve down stream exploitation, of forest resources by European industry.

KBBE-2009-1-2-08: Assessing and reducing vulnerability of European forests to climate change and the consequences for industrial and societal needs - SICA (Russia)

Call: FP7-KBBE-2009-3

European forests fulfil multiple needs for forest owners, industry, society and the environment. In recent years, there has been an unprecedented revival in the use of wood as a renewable resource and demand has increased tremendously. At the same time European society has developed an increased appreciation of the biodiversity, environmental protection, and recreational value of forests. Furthermore, the climate is changing at an unforeseen rate leading to increasing pressure on plant species distribution and competition from invasive species. Research is required to increase understanding of the multi-functional nature of natural and planted forest resources in Europe in response to such stress. With growth in international trade, forests in Europe are at ever increasing risk of damage from exotic pests and pathogens. The direct impacts of these alien invasive pests and pathogens include reductions in primary production and elimination of susceptible plant species and their associated flora and fauna. Effects include alterations in timber species available for local, regional and national industries, destabilising of forests leading to reduction in water catchment efficiencies and increased risks of flooding and erosion. Work in this project will focus on the development of modelling methods enabling more accurate predictions of invasions by alien pests and pathogens, the pathways through which the organisms spread at international, national and local levels, and the potential impacts of these organisms on forests in different climatic zones. Results will be targeted at quarantine organisations in EU Member States and Associated countries and internationally, and to the trade in live plants and associated materials into and within the EU.

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

Additional eligibility criteria: SICA - Minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC among which Russia.

Additional information: It is viewed that the active participation of relevant partners from United States or Canada should add to the scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken; this will be considered by the evaluators.

Expected impact: The European and international added value lies in mutual knowledge generation to reduce research fragmentation at EU and international levels on the biology and distribution of alien pests and pathogens threatening EU forest biosecurity. The added value to Europe's forests further lies in the expected improved diagnostic tools and guidelines for the detection and prevention of entry of potentially damaging invasive alien pests and pathogens at EU borders by plant health and quarantine organisations. Impacts will include production of predictive methods to assist in securing sustainable forest services, encompassing timber supplies and other, non-tangible forest benefits, in a time of rapid climatic change.

KBBE-2009-1-2-09: Impact and development of Conservation Agriculture techniques in developing countries – Mandatory ICPC (African ACP)

Call: FP7-KBBE-2009-3

Agroecology is the science of applying ecological concepts and principles to the design, development, and management of sustainable agricultural and food systems. It includes the socio-economic and environmental dimensions of sustainable development. Agroecology has already generated agricultural systems that increase productivity while preserving and restoring the environment and they are extensively used in some developed (e.g. USA) and developing and emerging countries (e.g. Brazil). However, it has had a much more limited impact in Africa for various biophysical and socioeconomic reasons which need to be analysed. Existing biophysical & socioeconomic models will be used and needs for

improvement of those models defined in order to better understand and develop conservation agriculture in Africa. Participation of policy makers, farmer organisations and the private sector will be essential to ensure success.

The project should include a training component with the aim to increase the research capacities in the participating developing countries. This could include participation in training programmes, short exchanges of staff, training workshops.

Funding scheme: Coordination and Support Action (supporting action)

Additional eligibility criteria: Minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC from African ACP countries.

Expected impact: The networking of major research players focussing on Africa and providing up-to-date knowledge and better understanding on (i) impacts of conservation agriculture techniques in Africa (successes and limitations) (ii) available biophysical and socioeconomic models to analyse those techniques (iii) need for research to improve those models in order to provide decision making tools to policy makers and farmers that will help them develop conservation agriculture in Africa. Thus the project will address global issues including natural resources management and land use, and foster cross-border regional cooperation. The research will contribute to meeting the EU's commitment towards the United Nations Millennium Development Goals.

KBBE-2009-1-2-10: Improving fisheries assessment methods by integrating new sources of biological knowledge

Call: FP7-KBBE-2009-3

Over recent years, a substantial knowledge base has been developed on essential life-cycle biological functions, in fish and shellfish including spawning, larval development, growth, maturation and reproduction, behaviour, migration etc. Fisheries assessment models maintain their original underlying biological assumptions, often dating back to Beverton & Holt's models or even Hjort's critical period in the early 20th century. The project should use available biological knowledge from other sources (e.g aquaculture, ecology) to check the validity or appropriateness of the biological assumptions underlying commonly used fisheries assessment models and to develop innovative or improved fisheries assessment methods.

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

Expected impact: The European added value lies in the expected contribution to ensure the development and the successful implementation of the Common Fisheries Policy and to improve natural resources management. Indeed, the current lack of accuracy in stock assessments and forecasts may undermine the credibility of the scientific advice used in fisheries management. This project will help to improve the accuracy and act as a basis for management decisions which will ultimately result in improved stakeholders' acceptance of the measures taken.

KBBE-2009-1-2-11: Improving mollusc spat production in hatcheries

Call: FP7-KBBE-2009-3

The project will improve knowledge on reproduction and control of gamete release, larvae and postlarvae feeding requirements, triggering of metamorphosis and, in general, ecophysiological needs of the commercial molluscs at different life stages and under controlled conditions (oysters (*Crassostrea gigas* and *Ostrea edulis*), mussels (*Mytilus edulis* and *M. galloprovincialis*), clams (*Ruditapes decussatus* and *R. philippinarum*) and others). Moreover, to decrease hatchery running costs and to maintain high quality and sustainable production, technological progress is needed. In recent years, demand for the above

mentioned hatchery spat has dramatically increased to complement the decline in wild fisheries; there is also a resulting demand to produce specific genetic strains and to diversify the sources of spat naturally available of these species. This project will help to overcome bottlenecks in the natural production of mollusc spat through a more controlled hatchery supply.

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

Expected impact: The European added value lies in the project's contribution to improving growth, competitiveness and sustainability of mollusc culture through a better control of spat production in captivity and, as a consequence, of the whole shellfish industry.

KBBE-2009-1-2-12: Sustainable inland extensive and semi-intensive aquaculture

Call: FP7-KBBE-2009-3

This project will increase knowledge on the two-way relationships between inland extensive and semi-intensive aquaculture and natural ecosystem processes in order to optimise productivity, including disease prevention and control, and/or promote new production systems. It will also develop a set of characteristics of fish ecological performance and quality. Although low input inland aquaculture has existed for more than 2 millenniums, this activity still largely relies on a set of empirical observations and ancestral practices. The dependence on natural processes also represents a limit to productivity, implying a low compatibility with intense economic activity. This project will help reduce year on year production fluctuations and promote high quality products. The project will also consider the multifunctional potential of these systems to society and the ecosystem and while promoting exchange of best practices with similar coastal fish production systems in the EU.

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

Expected impact: Improvement of extensive and semi-intensive aquaculture is an effective and sustainable means for exploiting the natural resources of inland waters and will contribute to local economical development and social cohesion while promoting the value of key ecosystems.

KBBE-2009-1-2-13: From capture based to self-sustained aquaculture

Call: FP7-KBBE-2009-3

This project will substantiate the current knowledge on the reproduction of capture based eel in captivity, and at the same time establish the knowledge-base required for the controlled development of eggs and larvae, including larval feeding. In recent years a new aquaculture activity has developed directed at highly appreciated species for which the current level of production by commercial fisheries is not enough to meet consumers' demand and where the wild populations are facing serious fishing pressure. The development of a self-sustained aquaculture activity, independent from the supply of wild fish, is thus required both from an industrial and conservation perspective.

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

Additional information: It is viewed that the active participation of relevant partners from ICPC should add to the scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken; this will be considered by the evaluators.

Expected impact: The European added value lies in the project's contribution to improving competitiveness in the aquaculture industry and ensuring the sustainability of capture based aquaculture.

KBBE-2009-1-2-14: Sustainable use of seas and oceans: importance of foraging fish in the ecosystem

Call: FP7-KBBE-2009-3

Foraging fish (fish which are low in the trophic chain e.g. sprat, herring, Norway pout, sand eels, anchovy, sardines, capelin) play an important role in the ecosystem and for fisheries. They are very important as energy carriers through the ecosystem from phytoplankton and zooplankton to predatory fish, seabirds and mammals. The objective of the project is to establish the role of foraging fish, particularly with regard to ecosystem stability and biodiversity, which is relatively unknown and to establish the costs and benefits of maintaining high levels of foraging fish in an ecosystem.

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

Additional information: This is one of the coordinated topics with FP7 Cooperation Themes Energy and Environment.

Expected impact: The European added value lies in the project's contribution to support the integration of the ecosystem approach in the Common Fisheries Policy. It will improve knowledge on the role of foraging fish (fish which are low in the trophic chain) in the ecosystem and their economic value for the fisheries sector.

KBBE-2009-1-2-15: Sustainable use of seas and oceans: integration of aquaculture and fisheries in the coastal zone

Call: FP7-KBBE-2009-3

Coastal areas are subject to an increase in competing activities and protection (Natura 2000, Marine Strategy Directive) and are a source of potential conflict for space allocation. The maintenance and/or, the development of small scale coastal fisheries and aquaculture are highly dependant on the availability and accessibility of appropriate sites. The project will study the interactions between capture fisheries and aquaculture and evaluate the benefits and possible bottle necks for concomitant development of these activities in the coastal zone. It will propose, develop and evaluate the efficiency of spatial management tools (zoning, closed areas, etc) to promote different forms of coastal aquaculture and fisheries at different scales (e.g. local, regional) and will exploit mutual opportunities (e.g. artificial reefs, protected areas, wind farms, tourism etc) within a context of competition for space by multiple users. The project will also address differences in acceptance of activities by the society. The project should have a strong interdisciplinary character in particular interaction of social in economic sciences with other disciplines. In order to ensure maximum results, the involvement of the authorities and stakeholders concerned is necessary.

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

Additional information: This is one of the coordinated topics with FP7 Cooperation Themes Energy and Environment.

Expected impact: The European added value lies in the expected contribution to support the new Maritime policy and spatial planning of coastal areas identified in the Blue Book for a European Maritime Policy as a tool as a tool of aid to manage maritime activities in an integrated way. The project will contribute to maintain and/or develop coastal fisheries and aquaculture within a context of competition for space through a range of different spatial tools promoting positive interactions and mutual benefits.

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-2009-1-3-01: Porcine reproductive and respiratory syndrome (PRRS): new generation, efficacious and safe vaccine, new control strategies – SICA (China and South East Asia)

Call: FP7-KBBE-2009-3

Porcine reproductive and respiratory syndrome (PRRS) is one of the major health concerns of the pig industry. It is endemic in the EU and other parts of the world and is associated with considerable economic losses. High abortion rates and mortality of pre-weaned piglets and respiratory disease in fattening pigs are the main features of this syndrome. A highly infectious virus has appeared recently in China in pigs, which is believed to be a virulent strain of PRRS ('blue ear disease'). A similar disease has also been detected in Vietnam and Myanmar. Available data on the basis of immunity to the virus, the prevalence of the virus, the basis of pathogenicity, its tissue distribution during the different phases of the disease, its degradation during meat maturation, its survival in the environment and other factors influencing the release of the virus are not sufficiently known to allow for a true understanding of its prevention and control. Although PRRS is included in the World Organisation for Animal Health (OIE), there are no detailed standards for international trade nor are there any harmonised disease control measures in the EU. However, third countries which are free of the disease impose safeguard measures for imports from EU affected countries. Different types of vaccines are commercially available which are widely used. These vaccines do reduce the clinical symptoms but do not prevent infection and hence allow maintenance and spread of the virus mainly due to its high genetic variability which allows viral escape. The aim of this collaborative research topic is: to fill the knowledge gaps of this disease and develop a new generation of safe and efficacious vaccines, overcoming the drawbacks of the currently available vaccines. It will also address the potential role of low virulence PRRS viruses (including those of attenuated vaccines) in other respiratory syndromes. In order to ensure maximum results, the participation of the animal health industry is encouraged.

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

Additional eligibility criteria: SICA – minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC, among which 1 from China and 1 from South East Asia (Indonesia, Malaysia, Philippines, Thailand, Vietnam, Laos People's Democratic Republic, Myanmar and Cambodia).

Expected impact: The European and international added value lies in mutual knowledge generation, enhanced collaboration between different scientific disciplines, to improve preparedness for eventual introduction of higher virulent strains. The project will contribute to

reduce economic losses and hence increase competitiveness of EU pig producers, improve trade and provide added value along the production chain. The project will develop new safe and efficacious vaccines, design new control strategies in different production systems. It will foster capacity building and technology transfer.

KBBE-2009-1-3-02: Diseases caused by Orbiviruses (African horse sickness, bluetongue and epizootic haemorrhagic disease): development of new generation vaccines and accompanying tests

Call: FP7-KBBE-2009-3

Outbreaks of bluetongue (BT) virus in unprecedented Northern latitudes since summer 2006, the existence of potentially competent vectors, climate change, trade etc... and the presence of the disease in geographically close third countries, show that Europe is at a constant risk of further introduction and spread of BT virus serotypes as well as other related orbiviruses such as African horse sickness (AHS) and epizootic haemorrhagic disease (EHD). The collaborative project will focus on the development of new generation safe, stable and multivalent marker vaccines to limit virus replication and spread by vectors and inducing cross protection against different serotypes. In addition, it will develop the corresponding tests to allow the differentiation between infected and vaccinated animals (DIVA).

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

Additional information: It is viewed that the active participation of animal health industry and relevant partners from Third Countries should add to the scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken; this will be considered by the evaluators.

Expected impact: Vaccination is a key control measure in the prevention, control and eradication of diseases caused by orbiviruses. New generation vaccines will be developed which overcome drawbacks of both current live attenuated and inactivated vaccines (BT and AHS) in particular allowing cross-protection and stability. Thus the project will address cross-border issues and contribute to Community Animal Health Policy.

KBBE-2009-1-3-03: Bee health: identification of emerging honey bee pest and diseases and re-emergence of pathogens and explaining the intimate mechanisms and the reasons for increased honey bee mortality

Call: FP7-KBBE-2009-3

The project will fill knowledge gaps in honey bee pest and diseases, including the 'colony collapse disorder' and help explain the intimate mechanisms and the reasons for increased honey bee mortality, relating to the emergence of new- or re-emergence of well known pathogens, as well as interactions with endemic infections and parasitism, in different European areas. Genomics knowledge of the bee genome and of some pathogens (such as viruses) will be used to differentiate and explore host-pathogen interaction. As latent infection is commonly observed in bee colonies the qualitative assessment should be complemented with a quantitative approach. Special focus should be made on Nosema disease (*N. apis* and *ceranae*), viruses and the impact of Varroa destructor infestation. Environmental factors, including chronic exposure to pesticides, as well as husbandry and management practices should be carefully considered.

The final aim would be the development of diagnostic screening methods and sustainable disease prevention and control strategies. Practical transferability of results for use by beekeepers should be ensured.

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

Expected impact: The European added value lies in the pooling of interdisciplinary research expertise, thus creating economies of scale to address a cross-border issue and provide support to agricultural policies. Indeed, the massive loss of honey bee colonies may impact on agriculture via the pollination network. The role of pollinators is important both for our food supply and for the preservation of natural ecosystems.

KBBE-2009-1-3-04: Tick borne diseases. Improvement of current vaccine and development of new vaccines for theileriosis and babesiosis through exploitation of genomic data – SICA (China and Central Asia)

Call: FP7-KBBE-2009-3

Tick-borne diseases of livestock are responsible for considerable economic losses in tropical and temperate areas. Among the most important are piroplasmosis infections caused by theileria and babesia. Both are endemic in many developing countries and emerging economies and they represent a considerable constraint to development. Both diseases are also present in southern Europe where an increased prevalence has been detected. In particular the babesiosis, disease complex is gaining increasing interest as an emerging zoonosis in Europe and in other parts of the world. Vaccination is used in some developing countries as a means to reduce the disease. However, the current method used to induce immunity based on attenuated schizonts-infected cells has technical drawbacks, may induce a carrier status and may be the source for the introduction of other infections. Moreover, vaccines used against babesiosis are at present ineffective, expensive and unsafe. Current advances in genomics and vaccinology offer possibilities for a better differentiation of the pathogens, and an increased knowledge of the pathogenesis and host specificity, allowing for improvements in the current pathogen differentiation systems and the available vaccines and to develop safe and efficacious new vaccines. The topic will be mainly targeted towards malignant theileriosis and babesiosis in small ruminants; however collaboration with groups working in piroplasmosis in cattle should be sought.

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

Additional eligibility criteria: SICA – minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC, among which 1 from China and 1 from Central Asia (Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan and Turkmenistan).

Additional information: It is viewed that the active participation of groups working in Plasmodium infections in humans and of animal health industry should add to the scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken; this will be considered by the evaluators.

Expected impact: The European and international added value lies in mutual knowledge generation and in capability-building to develop better tools to control pathogen differentiation and for control of some of the most important tick-borne diseases in particular in areas highly dependent on the small ruminants and increase the potential production for development. The project will allow up-grading schemes using more productive but susceptible breeds. The research will contribute to meeting the EU's commitment towards the United Nations Millennium Development Goals.

KBBE-2009-1-3-05: Improving *Campylobacter* control measures in primary production of poultry

Call: FP7-KBBE-2009-3

Campylobacteriosis has become the most common cause of acute bacterial enteritis in many European countries. Many sources of this infection are reported but the main suspected food borne source is poultry meat. There is a need to better understand the epidemiology of *Campylobacter* in poultry production, in particular the effect of the environment, the geographical differences, seasonal variation and the variation between *Campylobacter* subtypes. Estimation of the importance of different sources of infection at farm should be performed to be able to develop better biosecurity measures at farm level. The project should also use modelling approaches to predict transmission of *Campylobacter* within and between flocks and farms and other sources of infection, in particular other farm animals. Methods for pre-harvest interventions (e.g. vaccination, fly control, the use of bacteriophages and bacteriocins, hygiene education, use of thinning etc.) to control campylobacteriosis in poultry production should be developed and evaluated with respect to their effectiveness and efficiency (quantitative analyses for *Campylobacter*, risk assessment studies to estimate public health risks, etc.), possibly in comparison with other interventions. The project should develop improved diagnostic tools at primary production level for monitoring and control. It should include development of practical technologies in cooperation with SMEs and include aspects of epidemiology, microbiology, risk assessment and economics. The project will deliver a synthesis on the state of knowledge, a selection of potential control options focussing on primary production and an identification of issues for future work.

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

Expected impact: The European and added value lies in the pooling of interdisciplinary research expertise, thus creating economies of scale as regards research capacity on *Campylobacter*. It will contribute towards improved food safety, reduced consumer concerns and thus improved public health.

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 will be supported through the development of adaptive approaches supportive to a whole ecosystem approach for the harvesting 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-2009-1-4-01: Development of detection methods for quarantine plant pests and pathogens for use by Plant Health Inspection Services

Call: FP7-KBBE-2009-3

This project will develop advanced sampling and detection methods for early and reliable detection of plant quarantine pests and pathogens, for use by National Plant Protection Organisations (NPPO's) in official inspection and surveillance programmes. The methods should facilitate effective exclusion, eradication or containment of such pests. The methods will be based on e.g. biochemical or acoustic technologies for individual pests or pest groups of phytosanitary (quarantine plant health) concern. The methodologies may include sampling and trapping methods using e.g. pheromones and attractants for agricultural, horticultural or forestry pest insects. One of the main areas of work will be the optimisation of monitoring and

sampling methods e.g. with interdisciplinary work on statistics. On-site monitoring methods at point of entry for regulated and emerging harmful pests and pathogens may be part of the proposal. Development of new or improved tools will be based on proven, innovative technologies suitable for surveillance-use by inspection services in EU Member States or for use at border inspections. These novel tools should preferentially be extendable for use by NPPO's in non-EU countries that are trading partners, e.g. prior to shipment to EU. Novel methods for economically and environmentally important quarantine pests and pathogens or e.g. developmental stages of quarantine pests for which NPPO's currently lack adequate methods will have priority; the project should deploy the necessary efforts to cover the largest possible number of these organisms. The cost of the detection methods proposed by this project will be compared to the expected benefits.

It is expected that this project will make best use and maintain excellent cooperation with other recent or ongoing projects and initiatives in the area.

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

Expected impact: The European added value lies in the project's contribution to scientific support to the EU plant health policy, by the provision of sampling and detection methods in particular. The project will significantly help to tackle increasing risks to EU plant health from regulated or emerging exotic pests linked to increased globalisation of trade in plants and plant products. It will help EU countries to enforce the monitoring and survey of regulated pests and may ensure that imported plants and plant products comply with EC plant health import requirements. The novel detection methods should concern quarantine pests that currently lack technologically and economically adequate methods for effective exclusion, eradication or containment measures, and should thus help to minimise economic and environmental damage.

KBBE-2009-1-4-02: Spatial analysis of rural development measures for effective targeting of rural development policies

Call: FP7-KBBE-2009-3

With the advancement of GIS techniques, an ever growing amount of spatial data is available today. At the same time econometrics has been developed further which will allow to analyse such extended cross-sectional data sets (e.g. with 'spatial econometrics').

Stronger accountability requirements and EU budget constraints will increase the pressure towards policies targeted on specific objectives such as the provision of public benefits (environmental, rural, social).

For the EU's rural development programmes 2007-2013 Member States are requested to collect indicators on characteristics, needs, expenditures and results. Additionally, managing authorities in some Member States have created GIS-based databases with a huge amount of data related to area-based measures. What is lacking is analysis in which these data sets are combined with other indicators at a high level of regional disaggregation. Given these advances in econometrics and data availability, the scope of the project would be to develop quantitative models based on spatial econometrics (and other relevant econometric methods) for the assessment of the various rural development measures in the EU-27. The modelling approach should be combined with a user-friendly interface. The main objective of such a modelling tool would be to enable policy analysis to look into the causal relationships between characteristics, needs, expenditures and results of rural development measures in a spatial dimension.

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

Additional eligibility criteria: The requested European Community contribution shall not exceed EUR 2 000 000.

Expected impact: The project results will allow for a better targeting of rural development programmes and European added value will come from pooling national resources to obtain an EU 27 model. The impact assessment of programming rural development measures beyond 2013 needs to use tools which are based on the full set of data available.

KBBE-2009-1-4-03: A common data exchange system for agricultural systems

Call: FP7-KBBE-2009-3

Farming is faced with increasing requirements for data handling. Tools have to be developed which allow the exchange of different data families, to meet requirements arising from standards and norms (cross compliance), quality assurance schemes or geo-data handling as needed for precision farming.

Funding scheme: Coordination and Support Action (supporting action)

Expected impact: By the networking and sharing of data handling tools, the project results will lead to efficiency gains and cost reductions in the European farming sector.

KBBE-2009-1-4-04: Comparative analysis of factor markets for agriculture across the Member States

Call: FP7-KBBE-2009-3

This project will analyse the functioning of factor markets for agriculture in the EU-27, including Candidate Countries. The research will compare the different markets, their institutional framework and their impact on agricultural development and structural change, as well as their impact on rural economies, for the Member States and the EU as a whole. The research shall focus on land sale/lease, labour and capital markets and will include the impact of national and EU programmes on these markets. Examples of analysis to be foreseen would be: impact of capitalisation on land prices and factors relating to land transfer; analysis of human capital quality and mobility in the EU agriculture sector; determinants of sectoral investment decisions and impact of investment on technological change and capital stocks.

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

Additional eligibility criteria: The requested European Community contribution shall not exceed EUR 2 000 000.

Expected impact: The European added value lies in the project's contribution to a better understanding of the fundamental economic factors affecting EU agriculture, thus allowing better targeting of Common Agriculture Policy measures with the aim of improving the competitiveness of the sector.

KBBE-2009-1-4-05: Policy and institutional aspects of sustainable agriculture, forestry and rural development in the Mediterranean partner countries – SICA (Mediterranean Partner Countries)

Call: FP7-KBBE-2009-3

This project will provide research on the impact of EU and national policies relating to the agricultural sector, including – in addition to agricultural policy per se – policies covering rural development and the environment, as well as trade; impact of agri-food trade liberalisation (multilateral and bilateral) on the Mediterranean partner countries: studies on structural changes, impact on rural populations, including employment, poverty, income distribution and possible migration trends; commercial relations with major trade partners such as the EU; increasing competition on the export market with emerging economies;

impact of consumers' changing demands, prospects for quality products; impact of norms and standards on trade; institutional and traditional management of access to resources (land, water, etc.)

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

Additional eligibility criteria: SICA - Minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC from the Mediterranean Partner Countries. The requested European Community contribution shall not exceed EUR 2 000 000.

Expected impact: The European and international added value lies in enhanced collaboration between European and Mediterranean Partner countries and capability-building. The project results will support the trade relations by assessing the impact on Mediterranean partner countries. In addition, the research is expected to have a positive economic impact on both the EU and the targeted region(s). The research will contribute to meeting the EU's commitment towards the United Nations Millennium Development Goals.

KBBE-2009-1-4-06: Agricultural Innovation Systems & Traditional knowledge – Mandatory ICPC (African ACP)

Call: FP7-KBBE-2009-3

Agricultural Innovation Systems, including multiple stakeholders linked together in a dynamic process of research-development, is emerging as a major concept to build on the innovative capacity of stakeholders with their traditional knowledge and to provide tailor-made research contributions. Research could play a stronger role in innovation systems, but is not always effectively integrated with other components of these systems. In many countries, research agendas are still largely decided by scientists, with too little involvement of citizens, consumers, producers, and policy makers. This limits the beneficial impacts of agricultural research on development, particularly in complex and diverse situations of small-scale farming in developing countries. The project will develop research activities to deepen understanding of the potentials and limitations of current innovation processes involving different actors (farmers, researchers, private sector, policy makers, extension agents etc) in small-scale farming in Sub-Saharan Africa. An objective is to analyse interconnections between production activities, new rural dynamics and consumers' behaviour, with a view to guaranteeing food quality, economic, social and environmental sustainability of local agri-food systems as well as livelihood security for producers taking into account also knowledge to maintain plant and animal biodiversity. Territorial networks for agricultural research and development and associated education and training must be taken into account. The role of good linkages between traditional knowledge and formal research in these innovation processes will be analysed. Finally, further needs for research in this area of Agricultural Innovation Systems to benefit small-scale farming will be defined. The project should include a training component with the aim to increase the research capacities in the participating developing countries. This could include, for example, participation to training programmes, short exchanges of staff, training workshops.

Funding scheme: Coordination and Support Action (supporting action)

Additional eligibility criteria: Minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC from African ACP countries.

Expected impact: The European and international added value lies in mutual knowledge generation and in the networking of major research players in this field of research, to up-to-date knowledge and better understand (i) the current innovation processes for small-scale farming (successes and limitations), (ii) the role of traditional knowledge in these innovation

processes, and, (iii) the need for further research on agricultural innovation systems to benefit small-scale farming. The project will thus contribute to sustainable agriculture and support rural development. The research will contribute to meeting the EU's commitment towards the United Nations Millennium Development Goals.

KBBE-2009-1-4-07: Globalisation and trade impact on developing countries – Mandatory ICPC (African ACP)

Call: FP7-KBBE-2009-3

Support measures under the Common Agricultural Policy are progressively moving away from price or market support, towards income support to farmers. Other major agricultural producers, for example the US, also have significant income support measures. One of the aims of these CAP reforms, especially since 2003, is to make EU agriculture more competitive and market-oriented. The objective of this Coordination Action is to analyse the impact of the reformed CAP and of the US Farm Bill on international agricultural markets, where products of EU, US or other origins compete with products from developing countries and to determine the effects they have on the relative competitiveness of products of different origins (EU – US – Emerging countries - Developing countries) on different markets. The effects of certified schemes (organic, fair trade, Global GAP) on market access and livelihood of resource poor families should also be taken into account. The projects should include a training component with the aim to increase the research capacities in the participating developing countries. This could include, for example, participation to training programmes, short exchanges of staff, training workshops

Funding scheme: Coordination and Support Action (supporting action)

Additional eligibility criteria: Minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC from African ACP countries.

Expected impact: The European and international added value lies in mutual knowledge generation and in the networking of major research players in this area, providing up-to-date knowledge and better understanding of the impacts of EU policy choices in the CAP on developing countries' agricultures, and hence will contribute to the policy coherence commitments of the EU. The research will contribute to meeting the EU's commitment towards the United Nations Millennium Development Goals.

KBBE-2009-1-4-08: Agricultural Research for Development – ERA-NET¹²

Call: FP7-ERANET-2009-RTD

An ERA-NET (ERA-ARD) has been developed under FP6 in order to coordinate better European and Member States' agricultural research programmes for developing and emerging countries (including the outermost regions of the EU). Based on its significant achievements to date, new activities will be developed in order to (i) enlarge the coordination to a broader based of European & Members States (some important international players in this research field like Finland, Portugal, Sweden are not currently involved) (ii) to sustain current coordination efforts in terms of joint activities (e.g. capacity development in developing countries), and trans-national programs (Food & Energy); (iii) to answer to strong political demands to coordinate better Agricultural Research for Development (ARD) programs in critical domains (e.g. climate change, fisheries). Furthermore, a key objective will be to explore possible convergence and synergy between developmental agricultural research

¹² This topic is subject to a coordinated call for ERA-NETs across the Themes. Complete and detailed information on funding scheme, special eligibility criteria and expected impact of ERA-NETS can be found in Annex 4 of Cooperation Programme.

programs and European agricultural based research programs as recommended by the Standing Committee for Agricultural Research and the European Initiative for Agricultural Research for Development (e.g. on climate change, bioenergies). Involvement of representatives from developing countries will thus be necessary.

Funding scheme: Coordination and Support Action (supporting action)

Additional information: ERA-NET

Expected impact: The European added value lies in supporting and enhancing the ERA on agricultural research for development. A greater contribution and visibility of Europe towards achieving the Millennium Development Goals, through an increase in the effectiveness and efficiency of its research for development programs will be established along with the development of a more coherent European ARD and a facilitated access of developing countries to European ARD expertise. The research will contribute to meeting the EU's commitment towards the United Nations Millennium Development Goals.

KBBE-2009-1-4-09: Organic agriculture – ERA-NET¹³

Call: FP7-ERANET-2009-RTD

A new ERA-NET on organic farming and food systems aims at building on the results of the ERA-NET CORE Organic. The objective is to achieve a broader network of funding bodies, in particular towards new Member States and associated countries, to deepen the collaboration of the national funding bodies and launch trans-national calls in new areas.

Funding scheme: Coordination and Support Action (supporting action)

Additional information: ERA-NET

Expected impact: The European added value lies in supporting and enhancing the ERA on organic agriculture. A broad collaboration between Member States may lead to more efficient use of research funds, sharing of 'best practices' and transparent monitoring of trans-national organic research projects.

KBBE-2009-1-4-10: Consolidate alliances with Asia in the field of aquaculture - Mandatory ICPC (China and other ICPC from Asia)

Call: FP7-KBBE-2009-3

The objective is to improve coordination and programming of research activities funded by National and Community organisations in the field of aquaculture in Asia in order to avoid duplication and dispersion of research effort. The project will set-up an international multi-stakeholder platform to rationalise programming and discuss the needs for further research based on the principle of 'mutual benefit' which would establish the basis for sustainable aquaculture development in this region, within the context of global economy and trade.

Funding scheme: Coordination and Support Action (coordinating action)

Additional eligibility criteria: Minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC from Asia, among which China.

Expected impact: The European and international added value lies in capability-building to stimulate the involvement of EU aquaculture industry and RTD performers in the promotion of the sustainable development of aquaculture in the concerned region. The project will also facilitate the programming of research and technology development activities by national and Community funding agencies.

¹³ This topic is subject to a coordinated call for ERA-NETs across the Themes. Complete and detailed information on funding scheme, special eligibility criteria and expected impact of ERA-NETS can be found in Annex 4 of Cooperation Programme.

KBBE-2009-1-4-11: Consolidate alliances with the Mediterranean in the field of aquaculture - Mandatory ICPC (Mediterranean Partner Countries)

Call: FP7-KBBE-2009-3

The objective is to improve coordination and programming of research activities funded by National and Community organisations in the field of aquaculture in the Mediterranean in order to avoid duplication and dispersion of research effort. The project will set-up an international multi-stakeholder platform to rationalise programming and discuss the needs for further research based on the principle of 'mutual benefit' which would establish the basis for sustainable aquaculture development in this region, within the context of global economy and trade.

Funding scheme: Coordination and Support Action (coordinating action)

Additional eligibility criteria: Minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC from the Mediterranean Partner Countries.

Expected impact: The European and international added value lies in capability-building to stimulate the involvement of EU aquaculture industry and RTD performers in the promotion of the sustainable development of aquaculture in the concerned regions. The project will also facilitate the programming of research and technology development activities by national and Community funding agencies.

KBBE-2009-1-4-12: Supporting governance in aquaculture research and innovation

Call: FP7-KBBE-2009-3

Aquaculture has been the fastest growing animal production sector in Europe, supported by a major 'world-wide player' research Community and a self-sustainable, world-leading industry, which demonstrates a high potential for innovation and technological development. This project should facilitate the dialogue and the development of good governance practices between industry, research and policy makers. The project should also promote the exploitation, dissemination and communication of Community funded research projects to the different stakeholders and provide a forum for discussion on the needs of aquaculture research and innovation in Europe.

Funding scheme: Coordination and Support Action (supporting action)

Expected impact: Ensure a sustainable development of aquaculture by assuring good governance principles and facilitate the development of vision documents and strategic research agendas.

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-2009-2-1-01: Determinants of food habit formation/breaking

Call: FP7-KBBE-2009-3

Some food habits and eating patterns develop early in infancy, when there is no real evidence of a conscious choice and they are influenced by the child's environment and, possibly, sensorial perception. Research is needed in order to understand the process of formation of food habits and eating patterns and to identify the key determinants of behavioural changes (food habit-breaking).

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

Expected impact: The European added value lies in capitalising on the variety of food choice within Europe. Research in this area is rather limited in Europe. The results would support development of European policy directed towards healthier food habits. This research will help to increase understanding of the critical ages and periods when food habits and eating patterns form in infants and children and to support effective intervention strategies for habit-breaking and behavioural change directed towards healthier food choices.

KBBE-2009-2-1-02: Benefit/risk perception and communication in the food chain

Call: FP7-KBBE-2009-3

Consumers receive a broad range of information about food from a variety of sources that may be unbalanced or interpreted as conflicting or confusing. Efficient and appropriate communication tools should be developed, taking into account gender differences. In addition to classical media channels, new information routes and technologies need to be investigated to assess their potential to convey appropriate messages. Communication strategies can be very efficient if they are tailored to specific population groups or in the event of food crises. Involvement of consumer associations and relevant media channels is considered highly important.

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

Expected impact: The European added value lies in developing common approaches for communicating coherent messages across the Member States. This research will identify the barriers to risk communication at European level and develop appropriate communication model(s) in Europe, together with best communication and dissemination practice. It will make it possible to spread and implement European policy initiatives more efficiently.

KBBE-2009-2-1-03: Behavioural models for prevention of obesity, with a particular focus on children

Call: FP7-KBBE-2009-3

Behavioural research on nutrition and physical activity has started to develop recently. A better understanding of why people eat the foods they eat or why they do (or do not) participate in physical activity will help towards designing more effective programmes to combat obesity. Strategies should be evaluated and new ones developed to influence behaviour, particularly of children, based on assessing existing behavioural models, developing insights by combining different models and conducting new behavioural research.

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

Expected impact: The European added value lies in pooling experience at local level and developing new behavioural models that could be applied on a European scale. This research will make it possible to evaluate and develop strategies at European level with the aim of influencing behaviour, particularly of children. It will increase collaboration between different fields of science, contribute to the activities of the EU Platform on Diet, Physical Activity and

Health and support European public health policy, such as the White Paper on Nutrition, Overweight and Obesity.

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-2009-2-2-01: Stress, addiction and eating behaviour

Call: FP7-KBBE-2009-3

Eating behaviour and addiction share common neurobiological regulation mechanisms, regions of the brain controlling action, neurochemical pathways and reward reinforcement systems. They are strongly influenced by mood and socio-psychological stress situations. The aim of this topic is to broaden the basic knowledge on the complex neurological and (socio-) psychological interrelations between stress, eating behaviour and addiction (including to alcohol). In particular, strong links should be built between human nutritionists and research communities working on the basic principles of eating disorders and addiction. This research will, in particular, contribute to a better understanding of the addictive properties of individual food components and/or combinations thereof in certain foods or diets, of the potential effects of food components on prevention of addiction and of the socio-psychological reasons leading to eating disorders. It will also elucidate how typical stress situations in 'modern life' trigger disadvantageous eating patterns and addiction to certain foods. Potential gender differences will be addressed.

Funding scheme: Collaborative Project (large scale integrating project)

Expected impact: The European added value lies in building up the necessary critical mass in several fields of expertise and strengthening European research capacity in this area to provide sound scientific support to European public health policies. The European dimension is critical to development and use of new and harmonised methodologies in this area. Socio-psychological analysis of determinants of food addiction and, among others, current trends and motivations for youth drinking will provide scientific support for European public health policies. Europe's cultural diversity will have to be taken into account and links established between health and social and economic development at European level in order to gain a better understanding of addiction patterns and their potential adverse effects.

KBBE-2009-2-2-02: Role and mechanisms of action of plant bioactive compounds

Call: FP7-KBBE-2009-3

The message that individuals should try to consume a variety of fruit and vegetables is part of many government-sponsored social education programmes. Although the health-promoting effects of plant bioactives were originally attributed to their antioxidant properties, there is increasing evidence that many of their biological effects are actually related to their ability to modulate mammalian cell signalling pathways. Consequently, the scientific basis for the

strategy to improve health through diet is largely missing. The aim of this topic is to gain a better understanding of the role and biological modes of action of plant bioactive compounds at molecular, cellular and whole-organism levels. A greater understanding of the roles of bioactives in promoting health will lead to improved formulation of foods and recommendations for consumers concerning the specific contribution made by individual bioactives in foods. Appropriate dietary intervention studies are needed to support new recommendations. The relevance of longer term intervention studies should be explored. Scientific data on the risks and benefits linked to these compounds and on factors influencing their bioavailability and functional properties will be produced and evaluated.

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

Expected impact: The European added value lies in promoting synergies by means of interaction at European level in the form of integrating the expertise of plant biotechnologists, geneticists and (bio-) chemists with that of researchers in the fields of nutrition, microbiology, medical pharmacology and clinical epidemiology. The new food formulations, accompanied with nutrition and health claims, will increase competition and trade opportunities in Europe. European recommendations to promote health will be developed, taking into account the diverse eating patterns in Europe. The results will provide sound scientific data to support the common European policy on health and nutrition claims.

KBBE-2009-2-2-03: Development of biomarkers for health-promoting functions

Call: FP7-KBBE-2009-3

Robust biomarkers are crucial for measuring the availability of health-promoting food compounds at their physiological site of action, the continuity and scale of their proposed intrinsic primary activities *in vivo* and the health impact of these functions on physiologically and/or clinically relevant end-points. Models will be constructed (including animal models) to develop new sets of biomarkers for studying the effects of relevant food compounds on body functions of particular (patho-) physiological interest. In this regard, preferably 'whole-body' physiological concepts should be strengthened rather than reductionistic approaches; enabling technologies might make strong contributions to this end. Gender differences should be addressed.

Funding scheme: Collaborative Project (large scale integrating project)

Expected impact: The European added value lies in building up the critical mass in several fields of expertise necessary to achieve the objectives of this topic, in particular integrating basic science and enabling technologies. This research will develop harmonised European tools to allow data comparability across Europe and improve the biomarker concept in nutrition research.

KBBE-2009-2-2-04: Strategies for sustainable eating habits

Call: FP7-KBBE-2009-3

New eating habits and actual trends in production and consumption have a health, environmental and social impact. In the last few decades, far-reaching changes have occurred in lifestyles (move towards urban settings, dietary imbalances with excesses of certain nutrients and unhealthy dietary habits), food production and global exchanges. This project will investigate current food consumption patterns and trends in Europe and their environmental and socio-economic impact worldwide. The main objective is to develop strategies to improve the quality of the diet, while reducing the adverse environmental and socio-economic effects. Research needs and action to support related policy development

should be identified. Expertise in nutrition, food chain, life-cycle analysis, ecology, economics and social sciences is needed in view of the multidisciplinary nature of this work.

Funding scheme: Coordination and Support Action (supporting action)

Expected impact: The European dimension of the project is necessary in order to identify and disseminate best practice in the area of sustainable food consumption. This research will make it possible to promote healthy diets while minimising the ecological footprint, by generating knowledge on nutrition ecology and developing strategies to improve sustainable eating habits in Europe.

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-2009-2-3-01: New solutions for improving refrigeration technologies along the food chain

Call: FP7-KBBE-2009-3

Refrigeration is one of the most energy-consuming technologies along the food supply chain and poses a number of sustainability-related challenges. The aim is to study and demonstrate the added value of innovative alternatives to (conventional) chilling and freezing technologies in terms of food quality enhancement, consumer well-being and acceptance, energy efficiency and environmental impact. In addition to developing innovative technology, other tasks planned include demonstration activities and technology transfer covering the whole cold chain: chilling, freezing, packaging, handling, storage, transport, retail display cabinets and household refrigerators. Among the expected results is a clear picture of European refrigeration needs and advances as well as new refrigeration technologies. While focusing on generic approaches valid for a wide range of chilled and frozen foods of both plant and animal origin, specific food applications should also be developed.

Funding scheme: Collaborative Project (large scale integrating project)

Expected impact: The topic is expected to produce European added value as a result of the combined efforts of academics and industry to identify and tackle present challenges in the refrigeration sector all over Europe. This research will develop and validate sustainable cold chain processes supporting the competitiveness of European industries, in particular SMEs, with the primary aims of food safety and quality. It will boost consumer confidence in the whole food chain. The environmental aims are to reduce energy consumption, improve energy usage, employ environmentally benign refrigerants, and contribute to reducing the greenhouse effect.

KBBE-2009-2-3-02: Sharing food technology research and development by means of international collaboration – SICA

Call: FP7-KBBE-2009-3

The aim is to identify and characterise local products and traditional technologies in developing countries and to implement them in developed and developing countries. The ability to identify opportunities to use technological knowledge and to integrate it effectively

into novel applications is seen as crucial. This will require exchanges of knowledge and transfers and adaptation of technologies, along with effective collaboration with SMEs and industries (food producers and/or equipment manufacturers), both from developed and developing countries. Quantifiable and verifiable results such as novel multi-functional starter cultures, ingredients, foods and improved technologies, as measured against specific indicators of safety, quality and sustainability, are expected. Development of guidelines on quality management and consumer protection is seen as a precondition for trade opportunities. Consumer acceptance is a strong reason for action in this field.

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

Additional eligibility criteria: SICA – Minimum Number of Participants: 3 from different Member States or Associated countries and 3 from different ICPC

Expected impact: The European and international added value lies in mutual knowledge generation, enhanced collaboration between different scientific disciplines and stakeholders and in capability-building and increased trade opportunities for European and ICPC companies. In addition, the research is expected to have a positive economic impact on both the EU and the targeted region(s) by harnessing regional food products currently not widely available and known. The research will contribute to meeting the EU's commitment towards the United Nations Millennium Development Goals.

KBBE-2009-2-3-03: Sustainable food and feed processing

Call: FP7-KBBE-2009-3

Food and feed production and processing chain systems have considerable potentials for increasing sustainability. The aim is to develop alternative processes or to optimise current processes while maintaining food safety and quality. Energy and water savings, the choice of energy sources, improving efficiency, optimising raw material use and minimising effluent streams (except waste recycling or recovery) should be considered, with particular emphasis on smart energy and resource-saving technologies in SMEs. Sustainability indicators will have to be defined, validated, and applied, together with integrated assessment models (energy balance, life-cycle inventories, environmental analyses and economic assessments). Processing should not be seen separately; instead, the assessment should cover the whole production chain from raw material to product ready for consumption.

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

Expected impact: The European added value lies in defining and validating sustainability indicators, which goes beyond the private-sector interests alone. A European project will help to combine the diverse approaches taken in the individual Member States. This research will produce an innovation-driven increase in the competitiveness of food producers and food equipment manufacturers, in particular SMEs, in a field with a considerable environmental impact.

Area 2.2.4 Food quality and safety

Assuring chemical and microbiological 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-2009-2-4-01: Analytical tools for characterisation of nano-particles in the food matrix

Call: FP7-KBBE-2009-3

Applications and potential applications of nano-sciences in the food field require new detection tools and technologies to support monitoring and risk assessment. Research is needed to develop appropriate methods to detect and identify man-made nano-particles in food and drinks, to be applied in future risk assessment studies, in monitoring of consumer exposure and in environmental impact/dispersal studies. Focus should be placed on developing validated detection methods, reference materials and sample preparation. Wherever possible, related on-going research projects should be taken into consideration.

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

Additional information: It is viewed that the active participation of relevant partners from United States and/or Canada should add to the scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken; this will be considered by the evaluators.

Expected impact: The European added value lies in strengthening Europe's research capacity on risk assessment and European policies on application of nano-sciences in the food field. The results will increase the excellence and innovation potential of European research communities and improve their scientific and technological capability.

KBBE-2009-2-4-02: Risk-benefit assessment of food supplements –SICA

Call: FP7-KBBE-2009-3

The aim is to develop and validate science-based models to assess the risks and benefits of consumption of food supplements containing or consisting of plants and/or herbal extracts used in the EU. The concept of finding 'common currencies' for risk-benefit assessment should be explored. The research should also cover aspects related to the intake of various plants and herbal extracts. The biologically active compounds should be investigated and their safety, including contamination and residues, should be considered. International scientific cooperation should be ensured with countries producing plants and herbal extracts used as food supplements.

Funding scheme: Collaborative Project (large scale integrating project) for Specific Cooperation Actions Dedicated to International Cooperation

Additional eligibility criteria: SICA – Minimum Number of Participants: 2 from different Member States or Associated countries and 2 from different ICPC.

Additional information: It is viewed that the inclusion of SMEs should add to the scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken; this will be considered by the evaluators.

Expected impact: The European added value and international impact lies in bridging scientific fields, through expanding and generating knowledge on the risks and benefits of food supplements and in increasing international cooperation with mutual benefits. Involving and sharing information with the relevant stakeholders and a sharp focus on dissemination are expected to increase the science-based decision making and the safe use of food supplements.

KBBE-2009-2-4-03: Combined exposure to pesticides

Call: FP7-KBBE-2009-3

The potential effect on human health as a result of combinations of pesticides present in food should be investigated. Models and strategies for assessing risks arising from cumulative and

aggregate exposure to pesticides with a similar mode of action, suspected additive or synergistic effects, or complex mixtures should be addressed.

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

Expected impact: The European added value lies in advancing the state-of-the-art and laying a scientific foundation for addressing European policy needs. The research will contribute to the protection of European consumers by providing for exposure-based risk management tools in the area of pesticides in food. This research will contribute to improving the European policy and regulatory basis and benefit of the international community.

KBBE-2009-2-4-04: Prospects for novel foods

Call: FP7-KBBE-2009-3

This project will promote forward-looking debate on research and developments in the area of novel foods and novel food technologies, including bioethical aspects and societal needs. Planning ahead for research needs, with the involvement of key stakeholders from the food chain, will support the process of building the Knowledge Based Bio-Economy (KBBE).

Funding scheme: Coordination and Support Action (supporting action)

Expected impact: The European added value lies in contributing to identifying and addressing future challenges in the field of novel foods, including novel technologies. This research will support the development of European strategies for new and emerging research needs and the recasting of research agendas. It will help European society to plan ahead for and manage change and to foster a debate between scientists and the general public. It will also support policy in the area of novel foods.

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-2009-2-5-01: International food trade: anticipating the impact of climate change on the safety of European and global food markets – SICA

Call: FP7-KBBE-2009-3

Climate change is projected to have a significant impact on European and global food and feed markets. At present Europe is the biggest importer and exporter of food products. Climate change could make Europe more dependent on food imports of non-European origin but, conversely, offers new opportunities to the European food industry through the exploitation of new crops and animals originating from areas with an ecology similar to that expected in Europe in the future. The aim of this topic is dual: to explore new food and feed contamination pathways from natural and man-made chemicals and micro-organisms in Europe and, secondly, to investigate opportunities and risks for mutually beneficial international food trade, addressing all factors relevant to supporting and safeguarding trade in food, including appropriate packaging technologies, transport efficiency and logistics. The project will produce shared life-cycle quality assurance methods and processes together with risk assessment methods with Europe's non-EU partners that take into account their specific production and processing conditions.

Funding scheme: Collaborative Project (large scale integrating project) for Specific Cooperation Actions Dedicated to International Cooperation

Additional eligibility criteria: SICA – Minimum Number of Participants: 3 from different Member States or Associated countries and 3 from different ICPC.

Expected impact: High European added value is expected from this topic on the safety of food in Europe and of non-European origin by increasing the ability to identify, monitor and prevent global food safety risks. This research will contribute to provide a long-term vision and strategy on international food trade giving European customers guarantees of the safety and quality of food and feed of European and non-European origin. This research will enhance the competitiveness of the Union's food industry in the global marketplace. It will also identify non-tariff barriers and requirements for adaptation to the European food chain in order to seize opportunities for enhanced intra-European and international food trade. Finally, it will promote international RTD cooperation with non-EU countries of strategic importance to Europe, together with opportunities for setting up joint ventures.

KBBE-2009-2-5-02: Barriers to network learning in SMEs

Call: FP7-KBBE-2009-3

The large number of SMEs in the food sector constitutes a structural problem for their further contribution to economic growth, employment and sustainable development. Their ability to innovate and to interact successfully with larger, multinational food companies will depend on efforts to support cooperation and coordination by the sector to stimulate networking between SMEs. The objective of this research priority is to gain a better understanding of behavioural differences between food companies, their network preferences and the instruments required to manage the network. Understanding the integration needs and barriers is the first step towards developing sustainable business networks. However, as shown by several network initiatives, it is essential to know more about the factors deciding success in managing an efficient network. A database will be established on the network behaviour and preferences of European food SMEs.

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

Expected impact: Greater availability of usable know-how regarding European SME networks is seen as a major European added value. This research will develop business tools to enable SMEs to assess their own network needs, interests and preferences and to allow organisational change and strategic management leading to competitive and sustainable business networks. It will lead to the emergence of dynamic and sustainable SME networks capable of promoting and sustaining innovation in the food sector. The research will provide information and advice to policymakers and regulatory bodies regarding the factors deciding success in SMEs. It will also support long-term KBBE strategies in the European Research Area.

KBBE-2009-2-5-03: Transparency along the food value chain

Call: FP7-KBBE-2009-3

Transparency along the production and distribution paths of the food value chain is considered a critical factor in success in the food business. The need for transparency may differ, depending on the link in the chain (consumer, enterprise or public authority) as a function of culture, tradition and age, even within the same group of operators, and also over time. Understanding these differences and dimensions of transparency in order to generate trust in the food citizens eat remains a prerequisite for a well-functioning food sector. While

clarifying the concept of food chain transparency, the other frequently used terms of traceability and integrity should also be unambiguously defined

Funding scheme: Coordination and Support Action (supporting action)

Expected impact: The European added value lies in a common understanding of the concept of ‘food chain transparency’, which differs from one EU country and from one link in the food chain to another. Such a common understanding and operational definition of the terms ‘transparency’, ‘integrity’ and ‘traceability’ is a prerequisite for further research on this issue. This support action could therefore facilitate research on food chain management to enhance consumer trust in food quality and safety. This research will also identify and analyse best practice and experience with transparency at EU, national and/or local level.

Area 2.2.6 European Research Area

KBBE-2009-2-6-01: Enhanced co-operation in food and health with a view to strengthening the European Research Area

Call: FP7-KBBE-2009-3

Creation of a European Research Area in food and health will overcome the fragmentation of research activities, programmes and policies across Europe and contribute to increasing innovation and competitiveness in the food sector. The first objective is to map existing national structures responsible for research policies and funding in each Member State. Key players should be identified, along with the processes for making decisions at regional, national and transnational levels. The second objective is to develop strategies to improve public funding schemes, to mobilise new sources of funding and to coordinate existing funding programmes better at regional, national and European levels. Complementary features and synergies between the various national and European funding instruments should be explored, in particular between the 7th RTD Framework Programme (FP7), the Framework Programme on Competitiveness and Innovation (CIP) and the instruments of the Cohesion Policy. The strategies developed will take account of the gaps and overlaps between existing research needs, available technology tools and infrastructure in this specific field of research, which increasingly requires multidisciplinary and technological expertise.

Funding Scheme: Coordination and Support Action (supporting action)

Expected impact: The European added value lies in supporting and enhancing the ERA in food and health. It will make it possible to design better funding instruments, to improve mutual transparency, to ensure coherent development and closer cooperation between the various disciplines necessary for this complex field of research and to combine efforts and build up critical mass in areas of strategic importance. It will reinforce Europe’s role as a world partner and increase the leverage of the EU and the Member States by reducing duplication in the existing efforts of the Member States and the Commission on food research. It will improve performance in R&D and innovation and strengthen the competitiveness of EU businesses and regions, in particular by fostering entrepreneurship and promoting national, regional and innovative clusters.

Area 2.2.7 Coordinated Call with India (Department of Biotechnology – DBT)

In the context of global challenges for Activity 2.2: Fork to Farm: Food (including Seafood), Health and Well-Being, the EU is fostering international cooperation with Third Countries, in particular with those that are signatories of bilateral S&T agreements and play major roles in research and development in these areas, such as India. Proactive international cooperation efforts are required particularly in those areas where a clear mutual benefit exists in terms of

knowledge generation and market expansion. In this prospect and under the framework of the EU-India S&T Cooperation Agreement, the European Commission representing the European Community (EC) and the Department of Biotechnology (DBT) of the Government of India are working together to enhance opportunities for coordinated activities in Food, Agriculture and Fisheries, and Biotechnology research between European and Indian teams. Specifically, the EC and DBT will implement a coordinated call for proposals to address objectives of mutual interest via EU-India coordinated projects in Activity 2.2: Fork to Farm: Food (including Seafood), Health and Well-Being. Coordinated and tightly linked proposals, respectively from the EU (submitted for funding to FP7) and from India (submitted for funding to DBT), with a well balanced EU-India research co-operation effort will be called under the following two topics:

KBBE-2009-2-7-01: Development of functional foods and ingredients

Call: FP7-KBBE-2009-3

The aim of this topic is to develop foods or food ingredients beneficial to human health and therefore expected to bear nutrition or health claims. The research can be complemented and supplemented with the use of available databases on traditional foods and bioinformatics. Scientific data on the risks and benefits linked to these products or bioactive compounds will be produced and evaluated. The research will include studying the role and mechanisms (absorption and activity) of selected food components and the factors influencing their functional properties. Translational research approaches should be favoured and partnership with industry encouraged. The proposals should also take into account the exchange of researchers.

Funding Scheme: Collaborative Project (small or medium-scale focused research project), carried out in coordination with DBT (India)

Additional eligibility criteria: 1) Proposals that do not include coordination with an Indian project proposal submitted for funding to DBT will be considered ineligible. Therefore, the EC proposals must include detailed information on the coordinated Indian proposal, clearly indicating complementarity and operational links between the two proposals. 2) The requested European Community contribution shall not exceed **EUR 1 500 000**.

Additional selection criterion: FP7 project proposals will only be selected for EC funding on the condition that their corresponding coordinated Indian project is also selected for funding by DBT.

Expected impact: The two coordinated proposals should show a balanced EU-India research effort and properly coordinated – complementary and synergistic – research activities between Europe and India. This research is expected to contribute to the bilateral S&T agreement between the European Community and the Republic of India, based on mutual interests and shared benefits. It will increase the innovation potential and competitiveness of the European food industry, in particular SMEs. It will provide sound scientific substantiation for developing new functional foods and will support the common European policy on health and nutrition claims. It will enhance cooperation between scientific disciplines and stakeholders in Europe and India.

KBBE-2009-2-7-02: Valorisation of by-products in food processing

Call: FP7-KBBE-2009-3

Food processors are becoming increasingly aware that waste and by-products offer new market opportunities. This research will therefore address the issue of food waste and by-products of plant origin by taking a comprehensive approach looking for ways to turn food

processing by-products into new foods and/or feeds. An inter-disciplinary approach, investigating quality, chemical and microbial safety, environmental concerns and economic opportunities will be adopted. Inter-disciplinary research methods will include developing practical approaches for characterising the novel foods and/or feed and identifying the risks and benefits related to the new production processes, with emphasis on energy saving and innovative protocols. Translational research approaches should be favoured and partnership with industry encouraged. The proposals should also take into account the exchange of researchers.

Funding Scheme: Collaborative Project (small or medium-scale focused research project), carried out in coordination with DBT (India)

Additional eligibility criteria: 1) Proposals that do not include coordination with an Indian project proposal submitted for funding to DBT will be considered ineligible. Therefore, the EC proposals must include detailed information on the coordinated Indian proposal, clearly indicating complementarity and operational links between the two proposals. 2) The requested European Community contribution shall not exceed **EUR 1 500 000**.

Additional selection criterion: FP7 project proposals will only be selected for EC funding on the condition that their corresponding coordinated Indian project is also selected for funding by DBT.

Expected impact: The two coordinated proposals should show a balanced EU-India research effort and properly coordinated – complementary and synergistic – research activities between Europe and India. This research is expected to contribute to the bilateral S&T agreement between the European Community and the Republic of India, based on mutual interests and shared benefits. Access to India's and the EU's knowledge base in the area of environmentally sound food production technologies and processes, with the potential of establishing new technical standards, regulations and inputs into both the EU's and India's sustainable production policy, offers direct European added value. In the longer run, this type of international scientific cooperation with a major trading partner is expected to lead to setting up joint ventures and, hence, to better access to major food markets. This research will identify alternatives to present, highly wasteful food processing practices, resulting in more efficient and sustainable food production systems. It will also generate scientific information on a challenge of growing concern to society and industry.

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)¹⁴, 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.

KBBE-2009-3-1-01: Optimisation of secondary metabolite production in plants: localisation, transport, storage and stability

Call: FP7-KBBE-2009-3

Terrestrial plants produce a vast array of secondary metabolites, some of which have important pharmacological properties or which may be used as valuable industrial substrates. Optimisation of the production of plant secondary metabolites requires not only a detailed knowledge on the metabolic pathway involved in their synthesis as well as on the influence of environmental factors and production systems on their yield, but also on the cellular compartments where they are synthesised and stored.

The aim of the project will be to investigate the mechanisms regulating the synthesis, transport and accumulation of secondary metabolites in specific cellular compartments, cell types and tissues, and in defined developmental stages. With this knowledge the project will develop tools for efficient engineering of secondary metabolite pathways in plants (such as, for example, forest trees). Factors impacting on the stability of relevant secondary metabolites will also be studied in order to develop strategies for improving the stability of these metabolites and consequently their quality and yield. Depending on the type of secondary metabolites chosen to work with, the project could also encompass the study of secretion mechanisms.

¹⁴ 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.

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

Expected impact: The project is expected to produce European added value as a result of enhancement of the European research capacity and contribution to the development of plants as sustainable and competitive production platforms ('green factories') by improving knowledge required for efficient engineering of high yield and quality production of valuable industrial compounds in plants. The successful project will develop appropriate tools and explore their effective application for the industrially relevant secondary metabolites.

KBBE-2009-3-1-02: *Jatropha curcas* – breeding strategy – towards a sustainable crop for biomaterials and biofuels – SICA (India and/or African ACP and/or Latin America)

Call: FP7-KBBE-2009-3

The tropical shrub *Jatropha curcas* is an oil crop that raised interest in several tropical regions. Its oil can be processed for different purposes from biodiesel production to fine chemicals, pharmaceuticals and biomaterials.

The plant is drought tolerant and part of various farming systems in the tropics. Its integration into small scale farming in low-rainfall areas in agro-forestry or agro-pastoral systems can generate additional income for the rural poor. However, at the moment significant difficulties persist, as a result of very little systematic breeding and poor knowledge on genome and the plant agronomy. The project will tackle present bottlenecks for *Jatropha* cultivation such as the selection of optimised plants/genotypes suitable for different growing areas, asynchronous ripening, uniform yield and oil production, mechanised harvesting and lack of best cropping system definition.

The sustainability of the production systems should be evaluated including energy balance and environmental/economical analysis. Attention should focus on analysing non-toxic/non carcinogenic versus toxic accessions including aspects of plant protection given the potential of multiple applications of the protein-rich by-products, such as animal feed and/or other valuable components, through the bio-refinery concept.

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

Additional eligibility criteria: SICA (India and/or African ACP countries and/or Latin America) - Minimum number of participants: 3 from Member States or Associated countries and 3 from any of the above mentioned ICPC regions.

Additional information: It is viewed that the active participation of relevant partners from Africa-Caribbean-Pacific countries should add to the scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken; this will be considered by the evaluators.

Expected impact: The project will bring the use of *Jatropha* as industrial feedstock to a decisive step forward. The European and international added value lies in the development of *Jatropha* as a sustainable bio-based feedstock as this could contribute to poverty reduction (UN Millennium Development Goals) and to the EU bio-energy and climate change policy.

KBBE-2009-3-1-03: Abiotic stress tolerance: biotechnological applications from the lab to the field

Call: FP7-KBBE-2009-3

Plant genomics has become a rapidly developing field that is making available unprecedented tools for the improvement of plant properties relevant to sustainable and competitive crop performances (increased yield, altered metabolites content, stress tolerance), human and animal nutrition, as well as to non-food uses of plant products. A coordinated approach is

needed to optimise the results from plant genomics research and design better varieties to meet the challenges of a sustainable production.

The project will bring together experts in relevant areas of plant sciences and biotechnology, and related pertinent areas, to identify concrete strategic needs, bottlenecks, tools, methods, resources and standards for the development of a generic (not linked to a particular crop plant or plants for a particular use such as food, feed or bio-materials) translational pipeline for agricultural crops. Using an integrated multidisciplinary analysis the project will review scientific and technical challenges in the context of societal expectations and economic, environmental, legislative and regulatory parameters. In order to provide focus to this exercise, the project should exploit further the synergies to be gained by the interfacing of physiological and molecular/genetic research. The project will result in recommendations of key activities on abiotic stress tolerance that are of highest priority for translation of basic plant genomics to the field. It will also define strategies and tools for communication and dissemination of project results, to increase public awareness and understanding of the potential of plant genomics. The project will also provide recommendations for stakeholders (industry, academia, funding agencies, policy-makers, etc.) to ensure that the potential of plant genomics research will contribute to the development of the Knowledge Based Bio Economy (KBBE) and into societal benefits.

Funding scheme: Coordination and Support Action (supporting action)

Additional information: It is viewed that the active participation of relevant partners from United States should add to the scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken; this will be considered by the evaluators.

Expected impact: The project is expected to generate European added value as a result of enhancing the absorptive research capacities at European level. It will also contribute to turning the investment and effort put in plant genomics research into practical strategies, technological tools and applications for the optimisation of crop systems.

KBBE-2009-3-1-04: Prospecting for novel plant-produced compounds

Call: FP7-KBBE-2009-3

It is estimated that so far only 10% of the existing some 400000 higher plant species have been characterised chemically. Therefore, research is needed to assess the diversity of compounds produced by plants and their precursors (e.g. carbohydrates, lipids, peptides, proteins, small molecules, including phenolic and sulphur compounds) that could have a high potential for commercial exploitation.

The aim of the project will be to identify novel plant-produced compounds of potential economic interest (excluding medicinal compounds, as this is the scope of a previously published topic). The project will select (and justify the choice of) one or more chemical classes of compounds and will analyse the phytochemical diversity of these compounds using available state-of-the-art profiling methods, in not yet characterised plants (including trees and feral plants). The objective will be to identify the presence of related compounds, characterise their basic chemical properties (e.g. identity, structure), and to determine whether they possess novel or improved properties for their application or use.

Bioprospecting will fully adhere to relevant international treaties related to biodiversity preservation, sustainable use of its components, and fair and equitable sharing of benefits arising from genetic resources.

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

Additional information: It is viewed that the active participation of relevant partners from ICPC should add to the scientific and/or technological excellence of the project and/or lead to

an increased impact of the research to be undertaken; this will be considered by the evaluators.

Expected impact: The research conducted under this topic will produce European added value by enhancing the pan-European public awareness of biodiversity of natural resources. It will also expand the biochemical diversity of natural product libraries, generating novel lead compounds of plant origin to improve the competitiveness of the European and non-European industry, as well as the sustainability and eco-efficiency of these products. At the same time, it will propose novel uses of the target plant species, whose economic role may have been so far very limited or non-existent.

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-2009-3-2-01: Novel marine bioactive compounds for European industries

Call: FP7-KBBE-2009-3

Marine algae and animals are known as sources of numerous compounds with potential applications in pharmaceuticals, anti-tumour agents, neurodegenerative inhibitors, anti-coagulants, anti-virals, mucoprotectors and tissue replacements. Aim of the project is a close cooperation between industry and academia in view of screening marine animals and plants for new compounds, identifying their bioactive characteristics, testing for possible applications and determining sustainable production pathways. Research should be carried out in full compliance with the Convention on Biological Diversity and in cooperation with the local research community and authorities in the region of collection. The project should focus on animals and/or plants including micro-algae and cyanobacteria, but excluding other bacteria and fungi.

Funding scheme: Collaborative Project (large scale integrating project)

Additional information: It is viewed that a close cooperation between European industry and leading research institutions as well as the active participation of relevant partners from ICPC should add to the scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken; this will be considered by the evaluators.

Expected impact: The European added value lies in the urgently needed better integration of the under-developed research potential in European marine biotechnology, in particular in respect to public-private cooperation. Furthermore, this project will lead to a better availability of biotechnology products from the ocean and thus strengthen the competitiveness of the European industry in one or several business sectors (e.g. pharmaceuticals, food processing, chemicals, materials, sensor technology). The project should also enhance the research and exploitation capacities in marine biotechnology in the outermost regions of the EU.

KBBE-2009-3-2-02: Sustainable use of seas and oceans - Biomass from micro- and macro-algae for industrial applications

Call: FP7-KBBE-2009-3

Increasing competition for land and the potentially much higher yield per water surface area is making the use of aquatic environments particularly interesting for the production of biofuels and industrial bioproducts. Algae are considered a promising aquatic feedstock. The proposal should address the optimisation of the technologies and economics of using algae or algal products as an alternative to fossil raw materials for fuels and/or industrial products. The potential of using algae for mitigating climate change should be explored and quantified. Techno-economic and environmental analysis of the use of algae for the above-mentioned purposes should be an essential element of the proposed research. Furthermore, the project should include technological and methodological improvements up to testing activities at industrial scale pilot plants.

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

Additional information: This topic will be implemented in coordination with FP7 Cooperation Themes 'Environment' and 'Energy'. It is viewed that the inclusion of relevant partners from ICPC should add to the scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken; this will be considered by the evaluators.

Expected impact: The European added value lies in realising the objectives of the EC maritime policy by aiming at developing a strong, growing, competitive and sustainable maritime economy in Europe in harmony with the marine environment. This project will also contribute to achieving the EC biofuels targets by establishing algae as a complementary source for fuels. Algae will also serve as source for industrial products and be used in mitigating climate change. Techno-economic advice for the use of algae will also be delivered.

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-2009-3-3-01: Novel industrial microorganisms with optimised metabolic pathways

Call: FP7-KBBE-2009-3

Designing robust microbes, which are resistant to possible toxic compounds in feedstocks and capable of efficiently utilising a wide range of substrates is the key to simplifying and improving the effectiveness and economic viability of many industrial processes. Advanced

metabolic engineering research will be supported in a specific model system making use of post-genomic tools such as transcriptomics, metabolomics, proteomics, and evolutionary engineering (e.g. selection of mutants with higher performing or increased levels of enzymes). Cellular regulatory mechanisms including protein-protein interactions, protein-DNA interactions etc. should be addressed as well as product export from cells. These and other aspects of the design and engineering of novel pathways and/or networks will lead to improved industrially important microbial phenotypes with increased robustness and production efficiency for the chosen model system (microorganism/compound). Industrial participation is considered essential.

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

Additional information: It is viewed that the active participation of the academic and/or the industry should add to the scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken; this will be considered by the evaluators.

Expected impact: The European added value lies in intensified relations between European applied, strategic and curiosity driven research, in understanding the metabolic interactions and regulatory mechanisms in a model complex metabolic pathway which will facilitate the exploitation of the results by industry with a commercial product.

KBBE-2009-3-3-02: Integrated multi-enzyme, multistep biocatalytic engineering

Call: FP7-KBBE-2009-3

Fine chemical products resulting from increasingly complex biochemical pathways will require multi-enzyme systems, using multi-step reactions catalysed by cascades of enzymes. Multidisciplinary research is called for including enzyme and process engineering in the development of a multi-step bioreactor system that would allow co-enzyme regeneration. Multi-step enzyme processes should be investigated either by spatially positioning or mixing together different enzymes within the reactor, without the necessity of isolating intermediates.

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

Expected impact: The project is expected to produce European added value as a result of optimised use and networking of research infrastructures, the collection of useful information for the scale-up from laboratory bioreactors to industrial scale. Complicated chemical syntheses will be replaced by biocatalytic processes with high efficiency and low environmental impacts increasing sustainability, also giving a competitive edge to Europe's industrial biotechnology industry.

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-2009-3-4-01: Biomass and bioproducts: sustainability certification and socioeconomic implications – Mandatory ICPC (Latin America and/or African ACP and/or Asia)

Call: FP7-KBBE-2009-3

In the context of increased biomass production for industrial uses (biofuels and bioproducts) and an increase of biomass/bioproducts trade worldwide, there is a need to assess the sustainability of biomass production and the conversion chain with respect to its economic and societal impacts.

The developed assessment should cover following aspects, and others considered of relevance:

- i) Analysing current trading regimes of biomass and bio-products and identifying possible future trends on the basis of new legislation (e.g. Directives) and growing economies while assessing their opportunities and risks in terms of rural development, poverty alleviation and combating climate change.
- ii) Identifying opportunities and limitations in the development of biomass/bioproducts certification schemes in terms social sustainability. Studies on certification criteria have been carried out by several European countries and UNEP but a harmonised certification scheme would be highly desirable to assure sustainability while avoiding increased costs, exclusion of developing countries and to facilitate world trade. Social impacts of biomass production must be evaluated in exporting/importing countries.
- iii) Assessing links between socio-economical effects of biomass production for industrial use with water pollution, biodiversity loss, soil erosion, etc; assessing the feasibility of using grassy biomass from marginal areas and developing tools for assessing the suitability of different land types for biomass production. Determining the impact of production systems for 1st generation biofuels on bridging to the 2nd generation.
- iv) Assessing public perception of the use of biomass for its conversion into biofuels and bioproducts.

Funding scheme: Coordination and Support Action (coordinating action)

Additional eligibility criteria: Minimum number of participants: 3 from Member States or Associated countries plus 3 from Latin America and/or African ACP countries and/or Asia

Additional information: It is viewed that the active participation of relevant partners from United States and Canada should add to the scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken; this will be considered by the evaluators.

Expected Impacts: The development of sustainability criteria for biomass production, conversion systems and trade could assist in preventing negative socioeconomic impacts. The European and international added value lies in the development of appropriate international certification systems for biomass production and use will contribute to reaching socioeconomic goals and facilitate world trade. The project could assist to reaching the Millennium Development Goals.

KBBE-2009-3-4-02: Biomass pre-treatment for optimised biomass deconstruction and analytical characterisation – SICA (Brazil)

Call: FP7-KBBE-2009-3

The topic aims at the development and optimisation of pre-treatment technologies (including biochemical, chemical, thermal or thermochemical pre-treatment) of lignocellulosic biomass with the view to optimise its subsequent hydrolysis and conversion into biofuels and other bio-products. Research should include the development of analytical methods to characterise structural and non-structural biomass components and follow them and their reaction products through the pre-treatment. The optimised integration of the developed pre-treatment technologies in the desired biomass processing chains should be addressed. A range of feedstocks, such as woody biomass, agro-residues, municipal solid waste should be investigated.

The proposal should involve process development from lab scale to pilot plant and analysis of the economics of the developed technologies in the whole chain of the biomass processing. Demonstration activities aimed at proving the industrial relevance of the developed concept(s) should also be included.

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

Additional eligibility criteria: SICA (Brazil) - Minimum number of participants: 2 from different Member States or Associated countries plus 2 from Brazil.

Expected impact: The European and international added value lies in better prospects of agriculture, forest and biomass-related industries by developing and demonstrating technologies for optimised fractionation of lignocellulosic biomass into (C5/C6) sugars and lignin fractions as this will lead to expanded use and improved economics of European lignocellulosic biomass, e.g. woody crops, agricultural residues, Municipal Solid Waste (MSW). The project should contribute to realising European energy, environmental and rural development goals.

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 as bio-sensors, bio-remediation, waste treatment and recycling¹⁵.

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-2009-3-5-01: Molecular approaches to bioremediation of polyaromatic hydrocarbon compounds

Call: FP7-KBBE-2009-3

Biological processes play a major role in the removal of contaminants and they take advantage of the diversity and catabolic versatility of microorganisms to degrade or convert these hazardous compounds. Major methodological breakthroughs in recent years have enabled detailed analyses of environmentally relevant microorganisms providing

¹⁵ 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).

unprecedented insights into key aerobic and anaerobic biodegradation pathways and the ability of organisms to adapt to changing environmental conditions. The expected project should focus on the study, understanding and exploiting of the relevant molecular microbial diversity and the molecular biological processes which play a major role in the removal of Polyaromatic Hydrocarbons (PAH) contaminants from soils, sediments and wastewaters.

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

Expected impact: The molecular understanding of the degradation mechanism will constitute a significant advance in efforts towards the design of new knowledge-based strategies for the mitigation of ecological damage caused by PAHs in different habitats. The metabolic versatility of micro-organisms which play a major role in biodegradation may have a more general interest for biotechnology (bioplastics and biocatalysis). The topic is expected to produce European added value since Europe, like many other places of the industrialised world, is suffering from PAH pollution. Any advancement to the remediation technology is of adding value since this pollution affects strongly directly or indirectly (food chain, water quality) the health of European citizen. Thorough study on the versatility of microbial metabolism may add knowledge and value on other pathways useful for industrial biotechnology.

KBBE-2009-3-5-02: Innovative biotechnology approaches as eco-efficient alternative to industrial processes

Call: FP7-KBBE-2009-3

Exploiting and integrating advances in biotechnologies within new or existing industrial approaches has the potential to contribute to the improved sustainability of industrial processes and therefore to the substantial and measurable reduction of their environmental impacts. The objective of this topic will be to foster novel alternative eco-efficient processing routes for established industrial processes using biotechnology enabled approaches. The expected project should have strong industrial contribution and should foster innovative breakthrough biotechnology applications aimed to more eco-efficiency approaches on the core of multi-disciplinary research developed in an industrial context. Measurement of the eco-efficiency or sustainability of the proposed products and process alternatives should be taken on board within the project.

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

Expected impact: Aiming at developing innovative eco-efficient processing routes this project will produce European added value by opening up new industrial opportunities and will help realising the objectives of the EC environmental policy.

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 nanobiotechnology 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-2009-3-6-01: Nanobiotechnology: smart devices to study biomolecule dynamics in real time

Call: FP7-KBBE-2009-3

Real-time monitoring of biomolecular signalling processes in living cells is a significant challenge for the next phase of genomics and proteomic technologies. The possibilities to monitor *in vivo* processes within living cells could dramatically improve our understanding of cellular function, thereby revolutionising cell biology. Nanobiotechnology devices can provide dynamic information about biomolecules, interactions and conformational changes, without disrupting normal cellular process offering unprecedented insights into molecular functions and leading to novel and powerful tools for biological research and applications. The aim of the expected project should be the development of nanobiotechnology based techniques to study the biomolecules dynamic behaviour in living cells without the use of labels. The project should focus on life-sciences applications for industrial or environmental purposes.

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

Additional information: This topic will be implemented in coordination with FP7 Cooperation Theme Nanosciences, Nanotechnologies, Materials and new Production Technologies. It is viewed that the active participation of relevant partners from United States should add to the scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken; this will be considered by the evaluators.

Expected impact: The European added value lies in the new opportunities for scientific and technological advance this project will open. It will contribute to step changes and solutions in nanobiotechnology devices for biological research which will pave the way to future applications and markets.

KBBE-2009-3-6-02: Nanobiotechnology: functionalised membranes

Call: FP7-KBBE-2009-3

Recent developments in nanoscience and the inspiration derived from molecular biology are giving rise to new approaches aimed at manufacturing complex membranes with well-controlled architecture and functions. The attainment of this technological goal requires deep understanding of the underlying process of self-organisation and its application to the bottom-up design of structures. The objective will be to achieve functionalised membranes based on nanobiotechnology approaches with predictable and controllable properties, in particular composition and physico-chemical structures, which could be used as industrial or environmental membranes. The project focus should be on research on nanobiotechnology approaches. The project should identify and investigate new breakthrough functional membranes and explore how these features can be industrially exploited.

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

Additional information: Consortium should include end-users. This topic will be implemented in coordination with FP7 Cooperation Theme Nanosciences, Nanotechnologies, Materials and new Production Technologies.

Expected impact: Producing knowledge leading to future applications this project is expected to produce European added value as a result of strengthening competitiveness of European industry in one or several sectors (e.g. chemicals, pharmaceutical, environment, sensor technology) directly related to this high value added and fast growing field.

KBBE-2009-3-6-03: Nanobiotechnology: bio-interfaces for environmental applications

Call: FP7-KBBE-2009-3

Recent advances in nano-biosciences and technologies have a decisive impact on the performance of the new generation of biosensors and biochips. Nanobiotechnology enabled systems offer among others the possibility for improved biosensors for *in situ* monitoring of

environmental pollutants and pathogens (rapid detection of multiple species, trace element detection and real time monitoring). The expected project should aim to advance on the control and understanding of the bio-/bio- and/or non-bio/biological interface mechanisms, with the final aim to increase sensor performance and detection methods for application on environmental samples. The project should explore the interaction between biomolecules and surfaces at the nano-scale. The expected project should pave the way for future industrial biosensors applications for *in situ* monitoring of environmental pollutants and pathogens by designing structures which interact in a predictable and controllable way with biological systems.

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

Additional information: Consortium should include end-users. This topic will be implemented in coordination with FP7 Cooperation Theme Nanosciences, Nanotechnologies, Materials and new Production Technologies. It is viewed that the active participation of relevant partners from United States should add to the scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken; this will be considered by the evaluators.

Expected impact: By providing solutions going well beyond the state of the art in the area of environmental monitoring the project is expected to produce European added value by supporting the EC environmental policy. At medium term it will also offer new technical opportunities for the implementation by the European biosensors industry.

KBBE-2009-3-6-04: Nanobiotechnology: analysis of the ethical, safety, regulatory and socioeconomic aspects

Call: FP7-KBBE-2009-3

The main objective of this action is to support the scientific assessment of the potential risks associated with nanobiotechnology based materials and products (excluding nanomedicine). This support action should make a survey of the relevant issues, analyse the implications above looking at mid to long-term impacts and foresee scenarios on the possible consequences for the citizens, society and economy. Scientists, experts on ethical, regulatory, social and economic issues, policy makers and company representatives should be involved in the analysis. Conclusions should be drawn and recommendations should be issued.

The action should, in parallel to the above described activity, support the coordination of the different projects funded as result of this 2008 nanobiotechnology coordinated call.

Funding scheme: Coordination and Support Action (supporting action)

Additional information: This topic will be implemented in coordination with FP7 Cooperation Theme Nanosciences, Nanotechnologies, Materials and new Production Technologies.

Expected impact: The European added value lies in the promotion of safe, integrated and responsible nanobiotechnology research and it will pave the way to successful implementation. The project will also support coordination of nanobiotechnology FP7 funded projects.

KBBE-2009-3-6-05: Synthetic biology for biotechnological applications

Call: FP7-KBBE-2009-3

Synthetic biology enables a rational (engineering) recreation from basic elements of predetermined metabolic and catalytic properties. Synthetic biology may lead to minimal or even totally artificial microorganisms that can be used for microbial production processes with significant advantages in industrial or environmental biotechnology particularly where

complex metabolic networks are required. Such as yet hypothetical microorganisms could be derived from natural microorganisms with a minimal set of genes (minimal microorganisms), or could be synthetically generated *de novo*, using a given set of essential genes (synthetic microorganism). The main objective is the design of artificial cells *à la carte* with predetermined metabolic or catalytic properties aiming at catalysing microbial production processes or at degrading recalcitrant compounds in the environment. Safety and ethical issues should be addressed within the project by involving experts in these areas. It is expected that technological achievements as well as issues of safety and ethics to be discussed at international research fora.

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

Expected impact: The European added value lies in the expected gain of insight in the creative power of synthetic biology to develop a simple and efficient biological catalyst and/or production organism that can be easily modified or reprogrammed for the processing of novel or synthetic products in the contained facilities of an industrial plant. In the case of degrading recalcitrant compounds in the environment we could envisage the assembly of elements from databases containing information on microbial routes for total or partial catabolism of these pollutants.

Area 2.3.7 Biorefinery Joint Call

Biorefinery is the sustainable processing of biomass into a spectrum of value-added products (chemicals, materials, food and feed) and energy (biofuels, power and heat). By producing multiple bio-products and bio-energy, a biorefinery takes advantage of components and intermediaries and maximises the value derived from refining operations.

The aim of the joint call is the research, development and integration of innovative technologies to prove the viability related to the entire value chain (biomass production, biomass conversion, safe recycling and/or disposal of waste, conformity of end-products to end-user requirements) of advanced biorefineries. It will be implemented through two topics. The topic "Sustainable Biorefineries" will be targeted at the funding of a limited number of large, multi-disciplinary, collaborative projects addressing bio-products, bio-energy, sustainability and technical and economical viability. The topic "Enhancing exchange of information, synergies and cross-fertilization between projects in the field of Biorefineries" will further seek to promote coordination of on-going research at European and national levels across Biotechnology, Energy, Industrial Technologies and Environment on distinctive features of the biorefinery concept through a single Coordination Action.

Quality proposals with the intended level of integration are expected to achieve a breakthrough beyond the "business as usual" scenario. Furthermore, proposals shall necessarily include the sustainability assessment of any proposed solution on the basis of a life cycle approach. This shall be developed with the aim to provide a robust scientific basis for policy and decision making at different levels and scales (from production unit to policy development).

Specific information on the joint call evaluation and implementation is provided in the call fiche.

KBBE-2009-3-7-01: Sustainable Biorefineries

Call: FP7-2009-BIOREFINERY

Development of advanced biorefineries for sustainable processing of biomass into building blocks for the production of bio-based chemicals, materials, second generation biofuels, power and heat. The biorefineries shall demonstrate their performance, sustainability and feasibility at least at pilot scale in an integrated approach. Part of the biorefinery complex that is closer to the market shall be demonstrated at industrial pilot plant scale.

All proposals shall address the entire value chain from biomass feedstock production, logistics and pre-treatment to the development of thermo-chemical and bio-chemical technologies, including bio-technological routes, for the conversion of different types of biomass feedstock into bio-based products and energy. The utilisation and upgrading of residues and process waste streams and the purification and upgrading of the various products into final marketable services to consumers shall also be addressed. Bio-technological tools for the development of new non-food industrial crops and/ or biomass sources as feedstock may be applied. The upgrading and integration of new stable materials as well as of new non-enzymatic high-selective catalysts may be considered. The integration and optimisation aspects of all the main biorefinery sub-systems shall be described and show progress beyond the state-of-the-art.

With regard to sustainability, all proposals shall assess for the entire value chain the environmental, economic and social sustainability, including consequences due to the competition for food and biomass resources, the impact on water use and quality, changes in land-use, soil carbon stock balance and fertility, net balance of greenhouse gases, impact on biodiversity, potential toxicological risks, energy efficiency. Impacts on international and regional dynamics, end-users and consumer needs, investment feasibility may also be considered.

Funding Scheme: Collaborative Project

Additional information: The participation of relevant industrial partners, along with research organisations, SMEs, end-users and civil society organisations is essential to achieve the expected impact. This will be considered in the evaluation. The proposals may consider opportunities of international cooperation and address international integration of value chains, provided that they respond to sustainability criteria.

Expected Impact: Funded projects are expected to demonstrate the capacity of biorefineries to contribute to European competitiveness and wealth by responding to the need for supplying a wide range of bio-based products and energy in an economically, socially, and environmentally sustainable manner. New competences, new job opportunities and new markets are also expected. Furthermore the development of biorefineries is expected to also contribute to the implementation of several EU policies and initiatives, notably the SET Plan and the Energy & Climate Package in general.

KBBE-2009-3-7-02: Enhancing exchange of information, synergies and cross-fertilisation between projects in the field of Biorefineries

Call: FP7-2009-BIOREFINERY

The aim is to promote coordination of on-going research at European and national levels across Biotechnology, Energy, Industrial Technologies and Environment on distinctive features of the biorefinery concept. Information exchange and cross fertilisation may concern any aspect of the feedstock, the conversion and fractionation technologies, the integration of processes and uses of side-streams, the biofuels and the bio-based products, the energy efficiency, the economic, socio-economic and environmental performance, as well as other sustainability issues (impacts on food production schemes, impact on water use and quality, changes in land-use, access to resources, impact on biodiversity, and the net balance of greenhouse gases). Activities should aim to overcome fragmentation in this multidisciplinary

field and develop cross-thematic synergies by identifying gaps and overlaps, defining priority needs and infrastructure. In addition, activities shall involve dissemination of results.

Funding Scheme: Coordination and support action (coordinating action)

Additional information: The consortium should include a balanced partnership from all scientific domains involved (biotechnologies-agriculture-food, energy, environment and industrial technologies) with solid experience and competence in the field and strong project management skills. The partnership should demonstrate the added value of the cross-thematic collaboration in the proposed action. In that respect, the participation of relevant industrial partners is deemed as essential to achieve the expected impact. This will be considered in the evaluation. Networking and exchange activities with relevant international programmes shall be established. Up to one project may be funded.

Expected Impact: Significant improvement is expected in the exchange and use of the information available on biorefinery concepts within the thematic projects, in the identification of complementary research results and the cross-fertilisation to make best use of them, and in the synergies between the thematic projects. Significant enhancement is also expected in the cooperation between key researchers and industries that are active in Biorefinery research funded by EU and national programmes.

III IMPLEMENTATION OF CALLS

Call title: KBBE 2009: general call for proposals

- Call identifier: FP7-KBBE-2009-3
- Date of publication¹⁶: 3 September 2008
- Deadline¹⁷: 15 January 2009 at 17.00.00 (Brussels local time)
- Indicative budget: EUR 188.85 million from 2009 Budget^{18 19}
- The budget for this call is indicative. The final budget awarded to this call, following the evaluation of projects, may however vary by up to 10% of the total value of the call. All budgetary figures given in this call are indicative. The repartition of the sub-budgets awarded within this call, following the evaluation of projects, may vary by up to 10% of the total value of the call.

| Activity | Funding Schemes | Indicative amount (EUR million) |
|--|--|--|
| Activity 2.1: Sustainable production and management of biological resources from land, forest and aquatic environments | Collaborative Project (large scale integrating project) Collaborative Project (small or medium-scale focused research project) Collaborative Project (Small or Medium- | 83.52 |

¹⁶ The Director General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.

¹⁷ At the time of the publication of the call, the Director-General responsible may delay this deadline by up to two months.

¹⁸ Specific International Cooperation Actions (SICA) represent a maximum budget of EUR 42 million of the total budget and other actions with an important international dimension of EUR 42 million.

¹⁹ Under the condition that the preliminary draft budget for 2009 is adopted without modifications by the budget authority.

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| | Scale Focused Research Project) for Specific Cooperation Actions Dedicated to International Cooperation Coordination and Support Action (supporting action) Coordination and Support Action (coordinating action) | |
| Activity 2.2: Fork to farm: Food (including seafood), health and well being | Collaborative Project (large scale integrating project) Collaborative Project (small or medium-scale focused research project) Collaborative Project (large scale integrating project) for Specific Cooperation Actions Dedicated to International Cooperation Coordination and Support Action (supporting action) | 56.65 |
| | EC-INDIA Coordinated Collaborative Project (small or medium-scale focused research project) | 3 |
| Activity 2.3: Life sciences, biotechnology and biochemistry for sustainable non-food products and processes | Collaborative Project (large scale integrating project) Collaborative Project (small or medium-scale focused research project) Coordination and Support Action (supporting action) Coordination and Support Action (coordinating action) | 45.68 |

- Topics called:

| Activity/ Area | Topics called | Funding Schemes |
|--|---|---|
| Activity 2.1: Sustainable production and management of biological resources from land, forest and aquatic environments. | | |
| 2.1.1 | <i>KBBE-2009-1-1-01: Integration of tools to support a system-based understanding of complex biological processes</i> | <i>Collaborative Project (large scale integrating project)</i> |
| 2.1.1 | <i>KBBE-2009-1-1-02: Mining genomics information of small ruminants to generate understanding of the genetic basis of phenotypes important to sustainable production and health</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.1.1 | <i>KBBE-2009-1-1-03: Optimisation of methods to maintain farm animal biodiversity – SICA (African ACP)</i> | <i>Collaborative Project (small or Medium-Scale Focused Research Project) for Specific Cooperation Actions Dedicated to International Cooperation</i> |

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| 2.1.2 | <i>KBBE-2009-1-2-01: Legumes: key multifunctional legume crops for an energy-efficient and environmentally friendly future European agriculture</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.1.2 | <i>KBBE-2009-1-2-02: Multifunctional grasslands for sustainable and competitive ruminant production systems and the delivery of ecosystem services</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.1.2 | <i>KBBE-2009-1-2-03: : Irrigation water saving solutions for Mediterranean agriculture – SICA (Mediterranean Partner Countries)</i> | <i>Collaborative Project (small or medium-scale focused research project) for Specific Cooperation Actions Dedicated to International Cooperation</i> |
| 2.1.2 | <i>KBBE-2009-1-2-04: Improving performance and quality of crops in the context of organic and low-input systems by breeding and management</i> | <i>Collaborative Project (large scale integrating project)</i> |
| 2.1.2 | <i>KBBE-2009-1-2-05: Water stress tolerance and water use efficiency in food crops</i> | <i>Collaborative Project (large scale integrating project)</i> |
| 2.1.2 | <i>KBBE-2009-1-2-06: Developing new methods for valuing and marketing currently non-marketable forest functions, goods and services</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.1.2 | <i>KBBE-2009-1-2-07: Meeting industrial requirements on wood raw-materials quality and quantity</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.1.2 | <i>KBBE-2009-1-2-08: Assessing and reducing vulnerability of European forests to climate change and the consequences for industrial and societal needs - SICA (Russia)</i> | <i>Collaborative Project (small or medium-scale focused research project) for Specific Cooperation Actions Dedicated to International Cooperation</i> |
| 2.1.2 | <i>KBBE-2009-1-2-09: Impact and development of Conservation Agriculture techniques in developing countries – Mandatory ICPC (African ACP)</i> | <i>Coordination and Support Action (supporting action)</i> |
| 2.1.2 | <i>KBBE-2009-1-2-10: Improving fisheries assessment methods by integrating new sources of biological knowledge</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.1.2 | <i>KBBE-2009-1-2-11: Improving mollusc spat production in hatcheries</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.1.2 | <i>KBBE-2009-1-2-12: Sustainable inland extensive and semi-intensive aquaculture</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.1.2 | <i>KBBE-2009-1-2-13: From capture based to self-sustained aquaculture</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.1.2 | <i>KBBE-2009-1-2-14: Sustainable use of seas and oceans: importance of foraging fish in the ecosystem</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.1.2 | <i>KBBE-2009-1-2-15: : Sustainable use of seas and oceans: integration of aquaculture and fisheries in the coastal zone</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.1.3 | <i>KBBE-2009-1-3-01: Porcine reproductive and respiratory syndrome (PRRS): new generation, efficacious and safe vaccine, new control strategies – SICA (China and South East Asia)</i> | <i>Collaborative Project (small or medium-scale focused research project) for Specific Cooperation Actions Dedicated to International Cooperation</i> |
| 2.1.3 | <i>KBBE-2009-1-3-02: Diseases caused by Orbiviruses (African horse sickness, bluetongue and epizootic</i> | <i>Collaborative Project (small or medium-scale focused research</i> |

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| | <i>haemorrhagic disease): development of new generation vaccines and accompanying tests</i> | <i>project)</i> |
| 2.1.3 | <i>KBBE-2009-1-3-03: Bee health: identification of emerging honey bee pest and diseases and re-emergence of pathogens and explaining the intimate mechanisms and the reasons for increased honey bee mortality</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.1.3 | <i>KBBE-2009-1-3-04: Tick borne diseases. Improvement of current vaccine and development of new vaccines for theileriosis and babesiosis through exploitation of genomic data – SICA (China and Central Asia)</i> | <i>Collaborative Project (small or medium-scale focused research project) for Specific Cooperation Actions Dedicated to International Cooperation</i> |
| 2.1.3 | <i>KBBE-2009-1-3-05: Improving Campylobacter control measures in primary production of poultry</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.1.4 | <i>KBBE-2009-1-4-01: Development of detection methods for quarantine plant pests and pathogens for use by Plant Health Inspection Services</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.1.4 | <i>KBBE-2009-1-4-02: Spatial analysis of rural development measures for effective targeting of rural development policies</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.1.4 | <i>KBBE-2009-1-4-03: A common data exchange system for agricultural systems</i> | <i>Coordination and Support Action (supporting action)</i> |
| 2.1.4 | <i>KBBE-2009-1-4-04: Comparative analysis of factor markets for agriculture across the Member States</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.1.4 | <i>KBBE-2009-1-4-05: Policy and institutional aspects of sustainable agriculture, forestry and rural development in the Mediterranean partner countries – SICA (Mediterranean Partner Countries)</i> | <i>Collaborative Project (small or medium-scale focused research project) for Specific Cooperation Actions Dedicated to International Cooperation</i> |
| 2.1.4 | <i>KBBE-2009-1-4-06: Agricultural Innovation Systems & Traditional knowledge – Mandatory ICPC (African ACP)</i> | <i>Coordination and Support Action (supporting action)</i> |
| 2.1.4 | <i>KBBE-2009-1-4-07: Globalisation and trade impact on developing countries – Mandatory ICPC (African ACP)</i> | <i>Coordination and Support Action (supporting action)</i> |
| 2.1.4 | <i>KBBE-2009-1-4-10: Consolidate alliances with Asia in the field of aquaculture - Mandatory ICPC (China and Asia)</i> | <i>Coordination and Support Action (coordinating action)</i> |
| 2.1.4 | <i>KBBE-2009-1-4-11: Consolidate alliances with the Mediterranean in the field of aquaculture - Mandatory ICPC (Mediterranean Partner Countries)</i> | <i>Coordination and Support Action (coordinating action)</i> |
| 2.1.4 | <i>KBBE-2009-1-4-12: Supporting governance in aquaculture research and innovation</i> | <i>Coordination and Support Action (supporting action)</i> |
| Activity 2.2: Fork to farm: Food (including seafood), health and well being | | |
| 2.2.1 | <i>KBBE-2009-2-1-01: Determinants of food habit formation/breaking</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.2.1 | <i>KBBE-2009-2-1-02: Benefit/risk perception and communication in the food chain</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |

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| 2.2.1 | <i>KBBE-2009-2-1-03: Behavioural models for prevention of obesity, with a particular focus on children</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.2.2 | <i>KBBE-2009-2-2-01: Stress, addiction and eating behaviour</i> | <i>Collaborative Project (large scale integrating project)</i> |
| 2.2.2 | <i>KBBE-2009-2-2-02: Role and mechanisms of action of plant bioactive compounds</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.2.2 | <i>KBBE-2009-2-2-03: Development of biomarkers for health-promoting functions</i> | <i>Collaborative Project (large scale integrating project)</i> |
| 2.2.2 | <i>KBBE-2009-2-2-04: Strategies for sustainable eating habits</i> | <i>Coordination and Support Action (supporting Action)</i> |
| 2.2.3 | <i>KBBE-2009-2-3-01: New solutions for improving refrigeration technologies along the food chain</i> | <i>Collaborative Project (large scale integrating project)</i> |
| 2.2.3 | <i>KBBE-2009-2-3-02: Sharing food technology research and development by means of international collaboration - SICA</i> | <i>Collaborative Project (small or medium-scale focused research project) for Specific Cooperation Actions Dedicated to International Cooperation</i> |
| 2.2.3 | <i>KBBE-2009-2-3-03: Sustainable food and feed processing</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.2.4 | <i>KBBE-2009-2-4-01 Analytical tools for characterisation of nano-particles in the food matrix</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.2.4 | <i>KBBE-2009-2-4-02: Risk-benefit assessment of food supplements - SICA</i> | <i>Collaborative Project (large scale integrating project) for Specific Cooperation Actions Dedicated to International Cooperation</i> |
| 2.2.4 | <i>KBBE-2009-2-4-03: Combined exposure to pesticides</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.2.4 | <i>KBBE-2009-2-4-04: Prospects for novel foods</i> | <i>Coordination and Support Action (supporting Action)</i> |
| 2.2.5 | <i>KBBE-2009-2-5-01: International food trade: anticipating the impact of climate change on the safety of European and global food markets - SICA</i> | <i>Collaborative Project (large scale integrating project) for Specific Cooperation Actions Dedicated to International Cooperation</i> |
| 2.2.5 | <i>KBBE-2009-2-5-02: Barriers to network learning in SMEs</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.2.5 | <i>KBBE-2009-2-5-03: Transparency along the food value chain</i> | <i>Coordination and Support Action (supporting Action)</i> |
| 2.2.6 | <i>KBBE-2009-2-6-01: Enhanced co-operation in food and health with a view to strengthening the European Research Area</i> | <i>Coordination and Support Action (supporting Action)</i> |
| 2.2.7 | <i>KBBE-2009-2-7-01: Development of functional foods and ingredients</i> | <i>Collaborative Project (small or medium-scale focused research project) carried out in coordination with DBT (India)</i> |
| 2.2.7 | <i>KBBE-2009-2-7-02: Valorisation of by-products in food processing</i> | <i>Collaborative Project (small or medium-scale focused research project) carried out in</i> |

| | | |
|--|---|---|
| | | <i>coordination with DBT (India)</i> |
| Activity 2.3: Life sciences, biotechnology and biochemistry for sustainable non-food products and processes | | |
| 2.3.1 | <i>KBBE-2009-3-1-01: Optimisation of secondary metabolite production in plants: localisation, transport, storage and stability</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.3.1 | <i>KBBE-2009-3-1-02: Jatropha curcas – breeding strategy – towards a sustainable crop for biomaterials and biofuels – SICA (India and/or African ACP and/or Latin America)</i> | <i>Collaborative Project (small or medium-scale focused research project) for Specific Cooperation Actions Dedicated to International Cooperation</i> |
| 2.3.1 | <i>KBBE-2009-3-1-03: Abiotic stress tolerance: biotechnological applications from the lab to the field</i> | <i>Coordination and Support Action (supporting action)</i> |
| 2.3.1 | <i>KBBE-2009-3-1-04: Prospecting for novel plant-produced compounds</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.3.2 | <i>KBBE-2009-3-2-01: Novel marine bioactive compounds for European industries</i> | <i>Collaborative Project (large scale integrating project)</i> |
| 2.3.2 | <i>KBBE-2009-3-2-02: Sustainable use of seas and oceans - Biomass from micro- and macro-algae for industrial applications</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.3.3 | <i>KBBE-2009-3-3-01: Novel industrial microorganisms with optimised metabolic pathways</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.3.3 | <i>KBBE-2009-3-3-02: Integrated multi-enzyme, multistep biocatalytic engineering</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.3.4 | <i>KBBE-2009-3-4-01: Biomass and bioproducts: sustainability certification and socioeconomic implications – Mandatory ICPC (Latin America and/or African ACP and/or Asia)</i> | <i>Coordination and Support Action (coordinating action)</i> |
| 2.3.4 | <i>KBBE-2009-3-4-02: Biomass pre-treatment for optimised biomass deconstruction and analytical characterisation – SICA (Brazil)</i> | <i>Collaborative Project (small or medium-scale focused research project) for Specific Cooperation Actions Dedicated to International Cooperation</i> |
| 2.3.5 | <i>KBBE-2009-3-5-01: Molecular approaches to bioremediation of polyaromatic hydrocarbon compounds</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.3.5 | <i>KBBE-2009-3-5-02: Innovative biotechnology approaches as eco-efficient alternative to industrial processes</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.3.6 | <i>KBBE-2009-3-6-01: Nanobiotechnology: smart devices to study biomolecule dynamics in real time</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.3.6 | <i>KBBE-2009-3-6-02: Nanobiotechnology: functionalised membranes</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.3.6 | <i>KBBE-2009-3-6-03: Nanobiotechnology: bio-interfaces for environmental applications</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |
| 2.3.6 | <i>KBBE-2009-3-6-04: Nanobiotechnology: analysis of the ethical, safety, regulatory and socioeconomic aspects</i> | <i>Coordination and Support Action (supporting action)</i> |
| 2.3.6 | <i>KBBE-2009-3-6-05: Synthetic biology for biotechnological applications</i> | <i>Collaborative Project (small or medium-scale focused research project)</i> |

- **Eligibility conditions**

It is important to note that the following funding thresholds will be applied as eligibility criteria and that the proposals which do not respect these limits will be considered as ineligible:

- **Collaborative Projects (small or medium-scale focused research actions) and Collaborative Project (small or medium-scale focused research actions) for Specific Cooperation Actions Dedicated to International Cooperation:** the requested EC contribution shall not exceed EUR 3 million unless stated otherwise for a given topic in the work programme and indicated in the table below (Particular requirements for participation, evaluation and implementation).
- **Coordination and Support Actions (coordinating actions) and Coordination and Support Actions (supporting actions):** the requested EC contribution shall not exceed EUR 1 million unless stated otherwise for a given topic in the work programme.
- **Collaborative Projects (large scale integrating projects) and Collaborative Project (large scale integrating projects) for Specific Cooperation Actions Dedicated to International Cooperation:** the requested EC contribution shall not exceed EUR 6 million unless stated otherwise for a given topic in the work programme.

The minimum number of participating legal entities required, for all funding schemes, is set out in the Rules for Participation and presented in relevant parts below:

| Funding scheme | Minimum conditions |
|---|--|
| Collaborative Project (large scale integrating projects) and Collaborative Project (small or medium-scale focused research actions) | At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC |
| Collaborative Project (large scale integrating projects) for Specific Cooperation Actions Dedicated to International Cooperation and Collaborative Project (small or medium-scale focused research actions) for Specific Cooperation Actions Dedicated to International Cooperation | At least 4 independent legal entities. Of these, 2 must be established in different MS or AC. The other 2 must be established in different international cooperation partner countries (ICPC). |
| Coordination and support actions (coordinating action) | At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC |
| Coordination and support actions (supporting action) | At least 1 independent legal entity. |

The general eligibility criteria are set out in Annex 2 to this work programme

For the following topics, additional eligibility criteria apply, over and above the criteria state above:

| TOPICS | Particular requirements |
|--|--|
| KBBE-2009-1-1-03: Optimisation of methods to maintain farm animal biodiversity – SICA (African ACP) | SICA – minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC among which 1 from African ACP countries |
| KBBE-2009-1-2-03: Irrigation water saving solutions for Mediterranean agriculture – SICA (Mediterranean Partner Countries) | SICA - Minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC from the Mediterranean Partner Countries |
| KBBE-2009-1-2-08: Assessing and reducing vulnerability of European forests to climate change and the consequences for industrial and societal needs - SICA (Russia) | SICA - Minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC among which Russia |
| KBBE-2009-1-2-09: Impact and development of Conservation Agriculture techniques in developing countries – Mandatory ICPC (African ACP) | Minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC from African ACP countries |
| KBBE-2009-1-3-01: Porcine reproductive and respiratory syndrome (PRRS): new generation, efficacious and safe vaccine, new control strategies – SICA (China and South East Asia) | SICA – minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC, among which 1 from China and 1 from the South East Asia |
| KBBE-2009-1-3-04: Tick borne diseases. Improvement of current vaccine and development of new vaccines for theileriosis and babesiosis through exploitation of genomic data – SICA (China and Central Asia) | SICA – Minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC, among which 1 from China and 1 from the Central Asian region |
| KBBE-2009-1-4-02: Spatial analysis rural development measures for effective targeting of rural development policies | The requested European Community contribution shall not exceed EUR 2 000 000 |
| KBBE-2009-1-4-04: Comparative analysis of factor markets for agriculture across the Member States | The requested European Community contribution shall not exceed EUR 2 000 000 |
| KBBE-2009-1-4-05: Policy and institutional aspects of sustainable agriculture, forestry and rural development in the Mediterranean partner countries – SICA (Mediterranean Partner Countries) | The requested European Community contribution shall not exceed EUR 2 000 000 SICA - Minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC from the Mediterranean Partner Countries |
| KBBE-2009-1-4-06: Agricultural Innovation Systems & Traditional knowledge – Mandatory ICPC (African ACP) | Minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC from African ACP countries |
| KBBE-2009-1-4-07: Globalisation and trade impact on developing countries – Mandatory ICPC (African ACP) | Minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC from African ACP countries |
| KBBE-2009-1-4-10: Consolidate alliances | Minimum number of participants: 2 from different |

| | |
|---|--|
| with Asia in the field of aquaculture - Mandatory ICPC (China and other ICPC from Asia) | Member States or Associated countries and 2 from different ICPC from Asia, among which China |
| KBBE-2009-1-4-11: Consolidate alliances with the Mediterranean in the field of aquaculture - Mandatory ICPC (Mediterranean Partner Countries) | Minimum number of participants: 2 from different Member States or Associated countries and 2 from different ICPC from the Mediterranean Partner Countries |
| KBBE-2009-2-3-02: Sharing food technology research and development by means of international collaboration – SICA | SICA – Minimum Number of Participants: 3 from different Member States or Associated countries and 3 from different ICPC |
| KBBE-2009-2-5-01: International food trade: Anticipating the impact of climate change on the safety of European and global food markets – SICA | SICA – Minimum Number of Participants: 3 from different Member States or Associated countries and 3 from different ICPC |
| KBBE-2009-2-7-01: Development of functional foods and ingredients | Proposals that do not include coordination with an Indian project proposal submitted for funding to DBT will be considered ineligible. Therefore, the EC proposals must include a detailed explanation about the coordinated Indian proposal to be submitted to the DBT. The requested European Community contribution shall not exceed EUR 1 500 000 |
| KBBE-2009-2-7-02: Valorisation of by-products in food processing | Proposals that do not include coordination with an Indian project proposal submitted for funding to DBT will be considered ineligible. Therefore, the EC proposals must include a detailed explanation about the coordinated Indian proposal to be submitted to the DBT. The requested European Community contribution shall not exceed EUR 1 500 000 |
| KBBE-2009-3-1-02: Jatropha curcas – breeding strategy – towards a sustainable crop for biomaterials and biofuels – SICA (India and/or African ACP and/or Latin America) | SICA (India and/or African ACP countries and/or Latin America) - Minimum number of participants: 3 from Member States or Associated countries and 3 from any of the above mentioned ICPC regions |
| KBBE-2009-3-4-01: Biomass and bioproducts: sustainability certification and socioeconomic implications – Mandatory ICPC (Latin America and/or African ACP and/or Asia) | Minimum number of participants: 3 from Member States or Associated countries and 3 from Latin America and/or African ACP countries and/or Asia |
| KBBE-2009-3-4-02: Biomass pre-treatment for optimised biomass deconstruction and analytical characterisation – SICA (Brazil) | SICA (Brazil) - Minimum number of participants: 2 from different Member States or Associated countries and 2 from Brazil |

- Evaluation procedure:

- The evaluation shall follow a single stage procedure
- Proposals may be evaluated remotely
- The evaluation criteria (including weights and thresholds) and subcriteria, together with the eligibility, selection and award criteria, for the different funding schemes are set out in Annex 2 to this work programme
- Proposals will not be evaluated anonymously

- **Indicative evaluation and contractual timetable:**

— Evaluation results: three months after the relevant deadline mentioned above.

— Contract signature: It is estimated that the first contracts related to this call will come into force at the end of 2009.

Consortium agreements: Participants in Collaborative Projects (large scale integrating projects) are required to conclude a consortium agreement. For other projects consortia agreements are recommended.

The selected topics may be open only for the call indicated, and it is envisaged that up to one project will be retained for each topic, unless otherwise indicated. There may be competition between proposals submitted on different topics and proposals submitted on the same topic. This may result in some topics not being supported.

- The forms of grant and maximum reimbursement rates which will be offered are specified in Annex 3 to the Cooperation work programme.

- A reserve list may be produced of projects that pass the evaluation but fall below the available budget in case additional budget becomes available.

Specific information regarding the co-ordinated call with India

- **Indicative budget:**

EUR 3 million in 2009 by EC - Theme 2 'Food, Agriculture and Fisheries, and Biotechnology (a similar budget for the Indian participants via the coordinated call is expected from the Department of Biotechnology-DBT).

- **Topics called:**

| <i>Activity/Area</i> | <i>Topic called</i> | <i>Funding Scheme</i> |
|--|---|--|
| <i>Fork to Farm: Food (including Seafood), Health and Well-being / Coordinated Call with India</i> | <i>KBBE-2009-2-7-01 Development of functional foods and ingredients</i> | <i>Collaborative project (Small or medium scale focused research project) – in coordination with India</i> |
| <i>Fork to Farm: Food (including Seafood), Health and Well-being / Coordinated Call with India</i> | <i>KBBE-2009-2-7-02 Valorisation of by-products in food processing</i> | <i>Collaborative project (Small or medium scale focused research project) – in coordination with India</i> |

- **Submission and eligibility**

Two coordinated calls on the two topics above are launched by the EC (this call) and the Department of Biotechnology, Government of India, DBT (<http://www.dbtindia.nic.in/>), according to each respective rules.

Sets of two coordinated, complementary and tightly-linked project proposals on each topic -1. the EU proposal and 2. the India proposal - are submitted respectively to: 1. the EU proposal to this FP7–KBBE-2009-3 call, according to EC rules and 2. the India proposal to the DBT call, according to DBT guidelines.

- **Additional eligibility criteria**

The eligibility, selection and award criteria to be applied to this call are given in Annex 2 of this work programme. Proposals that do not include coordination with a specific Indian project proposal submitted for funding to DBT will be considered ineligible. Therefore, the EC project proposal must include detailed information on the coordinated Indian proposal, clearly indicating complementarity and operational links between the two proposals. In addition, for each project, the maximum EC funding requested must not exceed EUR 1 500 000.

- **Indicative evaluation and contractual timetable**

Evaluation: March 2009; Evaluation results: estimated to be available within three months after the closure date. A reserve list of projects might be established. Negotiations will be carried out in parallel by the EC and DBT, in order to have a synchronised start of the respective grant agreements.

- **Coordination agreements**

Participants in the EC projects are deemed to conclude a coordination agreement with the participants in the coordinated DBT project, linking the two projects and ensuring the necessary synergies under a single framework including appropriate arrangements regarding intellectual property rights. A draft coordination agreement has to be provided with the proposal.

- **Evaluation procedure**

The evaluation shall follow a single stage evaluation procedure. The proposals will be evaluated according to EC guidelines by a panel including both European and Indian experts.

- **Evaluation criteria and thresholds**

The evaluation criteria and sub-criteria to be applied to this coordinated call are given in Annex 2 of this work programme.

- **Additional selection criterion**

- Project proposals will only be selected on the condition that their coordinated Indian project is also selected for funding by the DBT.
- Up to one project per topic will be funded by the EC.
- In case the budget of EUR 3 million for the Coordinated Call with India in Activity 2.2 can not be consumed (totally or partially) the corresponding budget will be returned to the main part of Activity 2.2.
- Forms of grant and maximum reimbursement rates for projects funded through the Cooperation work programme are given in Annex 3 of this work programme.

End of call fiche

Call title: BIOREFINERY Joint Call

Call identifier: FP7-2009-BIOREFINERY²⁰

Date of publication: 3 September 2008

Deadline: 2 December 2008 at 17.00.00, Brussels local time²¹

Indicative budget^{22 23}: EUR 57 million from the 2009 budget of which:

- EUR 10 million from Theme 2 – Food, Agriculture and fisheries, biotechnology (KBBE)
- EUR 7 million from Theme 4 – Nanosciences, nanotechnologies, materials and new production technologies (NMP)
- EUR 30 million from Theme 5 – Energy
- EUR 10 million from Theme 6 - Environment.

The final budget awarded to this call, following the evaluation of projects, may vary by up to 10% of the total value of the call.

Topics called:

The Biorefinery topics are evaluated and implemented jointly by the Themes 2, 4, 5, 6 mentioned above. They are identical in each theme. When applying for this call please use one of the activity codes below. Each proposal should be submitted only once.

| Activity/ Area | Topics called | Funding Schemes |
|---|---|---|
| ACTIVITY KBBE 3: LIFE SCIENCES, BIOTECHNOLOGY AND BIOCHEMISTRY FOR SUSTAINABLE NON-FOOD PRODUCTS AND PROCESSES | | |
| KBBE-2009-3-7-01 | Sustainable Biorefineries | Collaborative Project |
| KBBE-2009-3-7-02 | Enhancing exchange of information, synergies and cross-fertilisation between projects in the field of Biorefineries | Coordination and support action (coordinating action) |
| ACTIVITY NMP 4: INTEGRATION OF TECHNOLOGIES FOR INDUSTRIAL APPLICATIONS | | |
| NMP-2009-4.0-1 | Sustainable Biorefineries | Collaborative Project |
| NMP-2009-4.0-2 | Enhancing exchange of information, synergies and cross-fertilisation between projects in the field of Biorefineries | Coordination and support action (coordinating action) |
| ACTIVITY ENERGY 3: RENEWABLE FUEL PRODUCTION | | |
| ENERGY.2009.3.3.1 | Sustainable Biorefineries | Collaborative Project |
| ENERGY.2009.3.3.2 | Enhancing exchange of information, synergies and cross-fertilisation between projects in the field of Biorefineries | Coordination and support action (coordinating action) |
| ACTIVITY ENV 3: ENVIRONMENTAL TECHNOLOGIES | | |
| ENV.2009.3.3.2.2 | Sustainable Biorefineries | Collaborative Project |
| ENV.2009.3.3.2.3 | Enhancing exchange of information, | Coordination and support |

²⁰ The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication

²¹ At the time of the publication of the call, the Director-General responsible may delay this deadline by up to two months.

²² A reserve list will be constituted if there are a sufficient number of good quality proposals. It will be used if extra budget becomes available.

²³ Under the condition that the preliminary draft budget for 2009 is adopted without modification by the budgetary authority.

| | | |
|--|--|------------------------------|
| | synergies and cross-fertilisation between projects in the field of Biorefineries | action (coordinating action) |
|--|--|------------------------------|

Indicative Budget per topic

| | |
|---|---------------------------------|
| | Indicative Budget ²⁴ |
| Sustainable Biorefineries | EUR 55 million |
| Enhancing exchange of information, synergies and cross-fertilisation between projects in the field of Biorefineries | EUR 2 million |

In case the budget of EUR 2 million for the topic 'Enhancing exchange of information, synergies and cross-fertilisation between projects in the field of Biorefineries' cannot be consumed (totally or partially) the remaining budget will be returned to the topic 'Sustainable Biorefineries'.

Eligibility Conditions

The evaluation criteria, together with the eligibility, selection and award criteria, for the different funding schemes are set out in Annex 2 to this work programme

The minimum number of participating legal entities required, for all funding schemes, is set out in the Rules for Participation. They are summarised in the table below²⁵:

| Funding scheme | Minimum conditions |
|--|--|
| Collaborative project | At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC. |
| Coordination and support actions (coordinating action) | At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC. |

Evaluation procedure:

- Proposals will not be evaluated anonymously.
- Proposals will be evaluated remotely with the consensus session being held in Brussels.
- The page limits that apply to proposals submitted under this call are given in the Guide for Applicants and in the proposal part B template available through the EPSS. The Commission will instruct the experts to disregard any pages in excess of these limits.
- At the Panel stage, proposals with equal overall scores will be prioritised according to their scores for the S/T Quality criterion. If they are still tied, they will be prioritised according to their scores for the Impact criterion.

²⁴ A reserve list will be constituted if there are a sufficient number of good quality proposals. It will be used if extra budget becomes available.

²⁵ MS = Member States of the EU; AC = Associated country. Where the minimum conditions for an indirect action are satisfied by a number of legal entities, which together form one legal entity, the latter may be the sole participant, provided that it is established in a Member State or Associated country.

TOPIC SUSTAINABLE BIOREFINERIES

The evaluation of the topic *Sustainable Biorefineries* shall follow a two-step procedure. The first stage proposals should focus on the S&T content and on clear identification of the intended results, their intended use and the expected impact (economic, social, environmental, etc.). Information on consortium composition and estimated financial resources involved should also be provided.

First stage proposals will be evaluated on the basis of their S/T Quality and Impact. Stage 1 proposals shall be submitted by the closure date mentioned above.

Coordinators of retained proposals in stage 1 ("go" proposals) will be invited to submit a complete proposal that will be then evaluated against the entire set of evaluation criteria. The closure date of the second submission will be specified in the invitation to submit the complete proposal. The indicative closure date is 05.05.2009.

Hearings may be organised.

Evaluation criteria and thresholds

Stage 1 proposals are evaluated on the basis of their **S/T quality** and **Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of 0.5 point scores. Successful proposals must pass the minimum thresholds as follows:

| STAGE 1 | Minimum threshold |
|-----------------------------------|--------------------------|
| S/T quality | 4/5 |
| Impact | 3/5 |
| Overall threshold required | 8/10 |

Stage 2 proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact**. For each criterion marks from 0 to 5 will be given, with the possibility of 0.5 point scores. Successful proposals must pass the minimum thresholds as follows:

| STAGE 2 | Minimum threshold |
|-----------------------------------|--------------------------|
| S/T quality | 4/5 |
| Implementation | 3/5 |
| Impact | 4/5 |
| Overall threshold required | 12/15 |

Indicative Evaluation and contractual timetable

Evaluation stage 1 proposals: remote phase December 2008, consensus phase January 2009
 Evaluation stage 2 proposals: remote phase May / June 2009, consensus phase June 2009.
 Evaluation results: estimated to be available by the end of July 2009. A reserve list of projects might be established.

The following points will be reflected in the evaluation

The participation of relevant industrial partners, along with research organisations, SMEs, end-users and civil society organisations is essential to achieving the expected impact.

TOPIC ENHANCING EXCHANGE OF INFORMATION, SYNERGIES AND CROSS-FERTILISATION BETWEEN PROJECTS IN THE FIELD OF BIOREFINERIES

The evaluation of the topic Enhancing exchange of information, synergies and cross-fertilisation between projects in the field of Biorefineries shall follow a one-step procedure. Proposals shall be submitted by the closure date mentioned above and evaluated against the entire set of evaluation criteria.

Evaluation criteria and thresholds

Proposals are evaluated on the basis of the following three criteria: **1. S/T quality; 2. Implementation; 3. Impact.** For each criterion marks from 0 to 5 will be given, with the possibility of 0.5 point scores. Successful proposals must pass the minimum thresholds as follows:

| | Minimum threshold |
|-----------------------------------|--------------------------|
| S/T quality | 3/5 |
| Implementation | 3/5 |
| Impact | 3/5 |
| Overall threshold required | 10/15 |

Indicative Evaluation and contractual timetable

Evaluations are expected to be carried out in December 2008 and January 2009 (Remote phase December 2008, consensus phase January 2009). It is expected that the contract negotiations for the short listed proposal will open by March 2009.

The following points will be reflected in the evaluation

The participation of relevant industrial partners is deemed as essential to achieving the expected impact.

POINTS RELEVANT TO BOTH TOPICS

Consortia agreements

Participants in Collaborative Projects are required to conclude a consortium agreement prior to grant agreement. Participants in coordination and support actions are encouraged, but not required, to conclude a consortium agreement.

The forms of grants and maximum reimbursement rates which will be offered are specified in Annex 3 to the Cooperation work programme.

IV OTHER ACTIONS

Activities outside of the calls for proposals:

Evaluations: experts to evaluate proposals

Monitoring, evaluation and impact assessment:

Expert groups:

- A foresight mechanism, for example initiated by Standing Committee on Agriculture Research (SCAR) will be established. It is expected to provide a better understanding into existing and new trends which are of importance for the development of the European Knowledge Based Bio-Economy. This task will be implemented through the setting up of ad hoc "consultancy expert groups", formed by high-level independent experts to be contracted at regular intervals by the Commission.
- A group of experts will be called to deliver a report on the basis of a socio-economic analysis for a possible Joint Technology Initiative in the EU food and drink sector. Based on a number of specific issues to be examined and in line with the Lisbon objectives, it will elaborate recommendations on actions enabling the creation of public/private partnerships in order to increase R&D investments in the EU food and drink sector.

Review of projects: experts to review FP-6 and FP-7 projects.

Call for tenders (public procurement):

- A study will be supported to establish performance indicators for bioclusters and bioregions in the KBEE area. It should offer tools to advisors and policy makers in the fields of biotechnology, innovation, and regional development (one contract, estimated amount: EUR 400 000, estimated publication date: end of 2008).
- A study will be supported to evaluate progress towards the realisation of the European Research Area in Food, Agriculture and Fisheries, and Biotechnology. It will identify the strengths and weaknesses of research in this domain and identify any sector specific barriers impeding the realisation of ERA (one contract, estimated amount: EUR 250 000, estimated publication date: first half of 2009).

Indicative budget for the 'Food, Agriculture and Fisheries, and Biotechnology' Theme for 2009:

| | Budget 2009^{26 27} |
|--|------------------------------------|
| Call-KBBE-2009-3 | EUR 188.85 million |
| Call FP7-2009-BIOREFINERY | EUR 10.00 million |
| Call-ERANET-2009-RTD (cf Annex 4) | EUR 2.00 million |

²⁶ Under the condition that the preliminary draft budget for 2009 is adopted without modifications by the budget authority.

²⁷ The indicative budget may be raised by the budget of the Recettes tiers.

| | |
|---|---------------------------|
| General activities (cf Annex 4) | EUR 2.49 million |
| Other activities: <ul style="list-style-type: none"> • Evaluations (EUR 1.54 million) • Monitoring, evaluation and impact assessment (EUR 2.15 million) <ul style="list-style-type: none"> ○ Expert Groups (0.15 million) ○ Group of experts reporting on a socio-economic analysis for a possible Joint Technology Initiative in the EU food and drink sector (0.05 million) ○ Review of projects (1.30 million) ○ Call for tenders (0.65 million) | EUR 3.69 million |
| Estimated total budget | EUR 207.03 million |

Summary Budget allocation to general activities for 2009 (cf Annex 4):

| | |
|-------------------------------|-------------------------|
| Cordis | EUR 0.65 million |
| Eureka/Research Organisations | EUR 0.02 million |
| COST | EUR 1.81 million |
| ERANET | EUR 0.01 million |
| TOTAL: | EUR 2.49 million |

All budgetary figures given in this work programme are indicative. Following the evaluation of proposals the final budget awarded to actions implemented through calls for proposals may vary:

- by up to 10% of the total value of the indicated budget for each call; and
- any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget

The final budgets for evaluation, monitoring and review may vary by up to 20% of the indicated budgets for these actions. The final budget awarded for actions not implemented through calls for proposals may vary by up to 10% of the indicated budgets for these actions.