



**European – Southeast-Asian - African – Latin American expert workshop on
Food security & Primary production mitigating and adapting to climate change**

Montpellier, France - 13-15 October 2010

POLICY NOTE

Expert workshop with 3 INCO-Nets generates future regional KBBE R&D themes

INCO-Nets from South-East Asia (SEA-EU-NET), Africa (CAAST-Net) and Latin America (Eularinet) **joined forces** in the identification, analysis, selection and formulation of **priority R&D themes cutting across the three regions**, focussing the KBBE “Climate change mitigation and adaptation for land management and food security”. The 2.5 days expert consultation in Montpellier, France, concluded a **multi regional preparatory process** on first stage topic **identification** and **selection** in regional consultations with **key stakeholders**. The Montpellier event resulted in **five one-page theme profiles** which form an important output from the INCO-Nets in providing the European Commission with **inputs** for their future Work programme formulation (2012 and beyond) on the KBBE.

3 PARTICIPATING INCO-NETS

The **SEA-EU-NET**, **CAAST-NET** and **EULARINET** projects are three **INCO-NET projects** based on the programme Capacities under the **7th Framework Programme of the European Commission (FP7)**. These INCO-NET projects aim to establish coordination platforms which bring together relevant policy makers, researchers, and other stakeholders of the **EU** and of **third countries** that belong to the targeted region in order to **identify priorities in Science and Technology (S&T) and support the definition of S&T cooperation orientations**. SEA-EU-NET is targeted to **South-East Asia (SEA)**, CAAST-NET to **Sub-Saharan Africa** and EULARINET to **Latin America**.

Started on early 2008, SEA-EU-NET, CAAST-NET and EULARINET have a 4 years runtime, and are currently supported by more than **50 key S&T institutions** from Europe, South-East Asia, Africa and Latin America.

One objective of these three projects is to **increase the quality, quantity, profile and impact of bi-regional Science and Technology (S&T) cooperation between** the Member and Associated States of the European Union (**EU**) and the ten member countries of the Association of South-East Asian Nations (**ASEAN**) for SEA-EU-NET and the Sub-Saharan Africa and Latin America countries for CAAST-NET and EULARINET. In particular, a specific objective of the projects is to strengthen the **participation of Third Countries** from South-East Asia, Africa and Latin America in the FP7 programmes.

One key activity of SEA-EU-NET, CAAST-NET and EULARINET is therefore to support **topics having a strong international dimension** (these can be **Specific International Cooperation Actions - SICAs**) in the thematic priorities of the “Cooperation” part of FP7. Indeed, every thematic priority of FP7 has to plan and implement dedicated international cooperation activities to better achieve the programme’s goals and to **tackle specific challenges that third countries face** or which **have a global character**. **These are defined** on the basis of mutual interest and mutual benefit (e.g. contributing towards Millennium Development Goals and addressing global climate change, combating biodiversity loss, water and energy scarcity...)

Consequentially, there is great interest to identify **topics of common interest** in regards to South-East Asian, African or Latin American partner countries, where all the parties will benefit from cooperation. In this context, it is important to **provide validated input** to the Programme Directorates on the S&T **potentials** of South-East Asia, Africa and Latin America, and to put forward **research topics of mutual EU – South-East Asian – African – Latin American interest**, while at the same time considering the **specific needs of the partner countries**.

Within SEA-EU-NET, CAAST-NET and EULARINET, this activity is performed through the organization of several **Thematic Workshops** on an annual basis, with the objective to produce a document containing **duly justified proposals for project topics having a strong international dimension**. This output document will include **key topics** for cooperation corresponding to FP7’s thematic priorities as well. **It is expected that some of the proposed topics might be included in the revisions of the thematic Work Programmes through topics** dedicated to **South-East Asia, Africa and Latin America**.

EXPERT WORKSHOP 13-15 October 2010, Montpellier

General objective of the 13-15 October expert workshop was: Within the framework of the Theme 2 “Food, Agriculture and Fisheries, and Biotechnology” of the Cooperation Programme of the FP7, to identify topics of common interest where Europe, South-East Asia, Africa and/or Latin America will benefit from S&T cooperation in the broad theme of **“Food security & Primary production mitigating and adapting to climate change”**. Specific objectives of the workshop:

- Provide justified research topics to EC on mutual EU – LA/AFR/SEA interests or where all regions will benefit from S&T cooperation,
- Consider the specific needs and specificities of LA/AFR/SEA partners,
- Take stock of previous projects and identify knowledge gaps and new research issues,
- Provide validated input to EC on the S&T potentials of LA/AFR/SEA,
- Show the EC added value for EU to work with LA/AFR/SEA on a range of important topics.

The 2.5 day organized, organized by CIRAD (as common partner in the 3 INCO-Nets) in Montpellier, France, assembled **35 participants from 15 countries** representing the EU, SE Asia, Africa and LAC regions. They included representatives from national ministries, regional stakeholder bodies, INCO-NET partners, and scientific experts. The EC DG-RTD was represented. ANNEX 2 shows the participant list.



In preparation for the consultation, each INCO-Net region formulated a **list of possible topic profiles** that were presented and discussed during the event in Montpellier. Through the application of 11 indicator considerations, the proposals were evaluated and subsequently ranked. **The final selected 5 topics were further analyzed** and reformulated during working group sessions.

COMMON R&D THEME SELECTION METHODOLOGY

❖ Preparatory phase

The theme selection approach was adopted from the EULARINET paper on best practices for topic identification (WP2). Each INCO-NET's partners nominated **scientific experts** according to a set of criteria, including:

- Excellence and previous experience with FP6/FP7 or scientists working as KBBE-NCPs;
- Interdisciplinary and open-mindedness regarding adjacent fields of research;
- Interest in or previous collaboration with LA/AFR/SEA or European scientists.

By performing these **national consultations** through each INCO-NET, we ensured the participation of the **major protagonists** in the respective field of research and a **balance of nationalities**. Regional centres (CGIAR and regional institutions) were also consulted.

Experts selected by each INCO-NET were then asked to elaborate a first idea for an international collaboration proposal using a template designed specifically by the organizers. To submit the proposals, compulsory guidelines were asked to each expert:

- Elaborate the proposals **in collaboration** with several institutions from Europe and LA/AFR/SEA to ensure that the topics were not representative of one single entity **but was shared and supported by several partners**;
- **Substantiate the priority** of the proposed topic and **justify its importance** according to 11 criteria (listed here below)

The experts identified by EULARINET participated in one videoconference (1 Oct '10) where topics were discussed and a first common priority list is elaborated. The objective of the videoconference was a ranking of each topic proposed, discussion about the highest core topics and final selection of experts and topics to be presented during the workshop in Montpellier.

Finally, a package of background documents was sent to each participant prior the workshop to ensure **maximum efficiency** and **benefit** during the discussions. This included:

- **Extended Reflection Paper KBBE 2012** – Draft June 2010 provided to the organizers by the EC;
- **Main outcomes of an international conference** organized by ERA-ARD, SCAR and EIARD in December 2009 entitled « *Dialogue between Europe and its Southern partners on agricultural research and climate change* » that outlined regional priorities for research.
- **Synthesis reports produced by the FP7 BIOCIRCLE** project that launched a series of National Round Tables in the 17 Third Countries in order to extract a short list of research lines per Activity of the KBBE theme
- Lists of **previous FP6 / FP7 projects** with KBBE focus involving South East Asian, African and Latin American partners over the period 2003-2010.
- **14 final consolidated proposals** submitted by the INCO-NETs

❖ Workshop phase

The 2.5 day workshop consisted mainly in a consultation on **topic screening, analysis, discussion and re-writing of selected proposals**. On day 1, experts were asked to give a **short presentation of their topic**. Each presentation was onwards followed by a **rapid screening** in plenary session based on the following **scientific, policy driven and efficiency criteria** (taking into account past & open FP7 calls and the outcomes of similar thematic workshops):

1. Compulsory international cooperation
2. Relevance / strategic importance of the topic for global or specific regional conditions (AFR, LA or SEA)
3. Mutual interest and added value for Europe
4. Evidence of potential partners / capacities in EU and Third Countries to conduct research of excellence on this topic
5. Originality and innovation proposed by the topic compared to previous calls in KBBE (no overlapping with past & open EU calls)
6. Most suitable funding scheme
7. Importance of the knowledge gaps and need for research in the thematic area of the topic.
8. Main EU policy guidelines and EU S&T drivers that support the topic
9. Matching with topics identified by the BIOCIRCLE roundtables Sept. 2010
10. Matching with priorities identified by the ERA-ARD, SCAR and EIARD Conference Dec. 2009.
11. Corresponding main lines from the reflection paper KBBE 2012

Day 2, consisted in a second round, **more in-depth evaluation** of the different criteria per topic in plenary session. **Discussions also included the potential merger and complementarities between topics, the identification of topics with potential global reach**. This discussion allowed for a topic ranking. Out of the 14 topics presented, 5 were preselected for further elaboration and 7 were deemed to need further work, information and/or expertise. The remaining time in day 2 and 3 were dedicated to analysis, consensus and reformulation of the 5 selected proposals, in working groups.

SHORT & LONGER TERM RESULTS

Two sets of principal outputs were generated. The **first output contains 5 top ranked profiles** that are proposed for inclusion in the FP7 KBBE 2012 work programme. Their titles, type of instrument and focus region are included in Table 1. **The full profiles are included as ANNEX 1.**

Table 1 - 5 top ranked profiles proposed for inclusion in the FP7 KBBE WP

Area & main line	Title	Instrument	SICA Region
Area 2.1.2 Main line 2.13.	1 - Ecological intensification of aquaculture systems in a changing and uncertain world	Small, medium cooperation	SE-Asia Latin America, Africa
Area 2.1.3. Main line 3.1.	2 - Anthropogenic changes and emerging diseases: a "One health" approach	Small, medium cooperation	SE-Asia Latin America, Africa
Area 2.1.2. Main line 2.3.	3 - Resilience and adaptation to stress in mixed agro-silvo-pastoral production systems under climate change in semi-arid regions	Large cooperation	Sub-Sahara Africa

Area 2.1.2. Main line 2.1.	4 - Innovative methodologies for information and decision support systems to improve risk management control of climate change impacts on agricultural production systems in Latin America	Small, medium cooperation	Latin America
2.1.2 Main line 2.5.	5 - Exploiting genetic diversity of major cereals for sustainable intensification of agriculture production under climate change constraints	Small, medium cooperation	SE-Asia Latin America

The second group of outputs constitutes a list of proposals that were generated in each of the 3 regions but that will need additional work are included in Table 2 with the purpose of creating a **trace** of regional R&D topics for EU interests in **future FP7 work programmes and/or other EC programmes**.

Table 2 – Profiles needing further elaboration or additional expertise

Area & main line	Title	Instrument	SICA Region
Area 2.2.5. Main line 3	1. Strategies for structuring production chains of Latin American autochthonous foods focused on sustainability, safety and functionality for the supply of global markets	Small, medium cooperation	Latin America
2.1.2 Main line 2.3.	2. Developing new methods to assess and lower the environmental impact of agricultural systems while maintaining agricultural production in SEA	Small, medium cooperation	SE-Asia
Area 2.1.2 Main line 2.6.	3. Agriculture and health: surveillance and control strategies for emerging plant and animal diseases and efficient water management	Large cooperation	Sub-Sahara Africa
Area 2.2.4. Main line 1.	4. Public awareness of food safety: implications for the South-East Asian countries	Small, medium cooperation	SE-Asia
Area 2.1.2. Main line 2.1.	5. Identifying ways of low greenhouse gases emissions livestock production	Small, medium cooperation	Latin America
Environment Activity 6.1..	6. Global Monitoring of Food Security (GMFS)	Small, medium cooperation	Sub-Sahara Africa
Environment Activity 6.1.	7. Integrated, high resolution climate and land-use modelling – based climate change adoption and mitigation strategies for vulnerable societies in developing countries	Small, medium cooperation	Sub-Sahara Africa

CONTACTS REGARDING THE WORKSHOP & PROPOSALS

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KBBE 2012 - Theme 1

Ecological intensification of aquaculture systems in a changing and uncertain world - SICA for South-East Asia, Latin America or Africa

- Area 2.1.2 : Increased sustainability of all production systems (agriculture, forestry, fisheries and aquaculture); plant health and crop protection
- Main line 2.13 : Ecosystem approach to aquaculture

In response to an increasing global demand for aquatic food, aquaculture has evolved and intensified but not without environmental and socio-economic trade-offs. While aquaculture already accounts for half of the global fishery production, its sustainability is challenged. To satisfy the demand of an increasing population, aquaculture may have to grow by another 30 million tons from 2010 to 2030 (FAO). However, large production areas and associated livelihoods are threatened by sea level rise and other effects of climate change including urbanization. Thus for aquaculture to further develop in the future, it has to be based on ecological intensification of systems, *i.e.* reducing resource use and waste output through a more efficient use of production factors in the ecosystems where they are located.

Previous and on-going related actions of EU cooperation have focused on: a) Recycling water and nutrients in both peri-urban and rural integrated production systems for poverty alleviation (POND-LIVE, PAPUSSA); b) Reducing nutrient emission in recirculation aquaculture (ZAFIRA); c) Focused food security for vulnerable sectors (FPAVAS); d) Sustaining Ethical Aquatic Products Trade (SEAT); e) Alternatives to fish meal (KBBE.2011.1.2-11: Aquaculture feeds and fish nutrition); f) Networking (Sarnissa, AqASEM09, AquaMed); and g) Knowledge collection, management and dissemination

The goal of this call is to reduce the vulnerability of the aquaculture sector and the people dependent on it for their livelihood. Specifically, the objectives of the project are to:

- 1) Develop new and integrate existing technologies in freshwater and coastal aquaculture aimed at optimizing nutrient and water use, reducing and mitigating environmental impact, and facilitating adaptation to climate-induced changes initially in Southeast Asia and then in Latin America and Africa.
- 2) Incorporate ecologically intensified aquaculture development in regional and national climate change strategies.

The project will take stock of the diversity of existing approaches and methodologies. It will target and include a wide range of stakeholders and consider gender and equity issues. Dissemination strategy will utilize most recent technologies, including IT, for producing user-friendly multi-media outputs.

Funding Scheme: Collaborative Action (small/ medium sized project)

Additional eligibility criterion:

- The requested European Union contribution shall not exceed EUR 3 000 000;
- At least one SME partner from each participating ICPC country is recommended;
- Duration of the project: 3 to 5 years;

Expected impact

- Reduced ecological footprint of intensified aquaculture production systems;
- Reduced variability of yield and income of intensified aquaculture systems;
- Increased EU and local food security;
- Ecologically intensified aquaculture included in national and regional climate change strategies.

ADDITIONAL INFORMATION

Half of EU aquatic products are now imported, the majority of which come from Asia. EU consumers increasingly need to have confidence in the way their food is produced, especially since geographical and cultural distance make the link between producers and consumers relatively weak for globally traded products.

Most EU past and on-going investment has been concentrated on knowledge collection, certification of best hygiene and farming practices, and networking as evidenced by the preparation of current call. The challenge is to identify new ways of producing more with less. In addition, a major challenge will be to convince both commercial and small scale producers to adopt ecologically intensive production systems.

Potential interest from:

- WorldFish Center – Asia
- University of Stirling - United Kingdom
- Wageningen University – Netherlands
- Asian Institute of Technology – Thailand
- University of the Philippines (Visayas) – Philippines
- Bureau of Fisheries and Aquatic Resources – Philippines
- SEARCA – Philippines
- UNESP – Brazil
- Cirad – France
- Ifremer – France
- CeTSAF, University Goettingen- Germany
- ASEM members, KBBE in Latin America members, SARNISSA members, AQUAMED members, NACA members, EULARINET members
- SMEs: Negros Prawn Producers Association, Lake Harvest, Shrimpex, Greenfields fish processors, IMANI business development, Regal Springs, CP feeds, Sateh, CENI Aqua, etc.

Experiences from previous FPs indicate that 3 years is too short to ensure research outputs relate and translate into measurable impact for end users and policy makers.

Existing calls: KBBE.2011.1.4-07: Role of aquaculture in improving food security and eradicating poverty worldwide. There exists however, knowledge gaps and significant lessons learned from which this current project call could add value to. For example, new innovative technologies have emerged, that could successfully improve aquaculture sustainability (nutrient recovery, food safety standards, and ICT among others).

KBBE 2012 - Theme 2

Anthropogenic changes and emerging diseases: a “One health” approach – SICA for South-East Asia, Latin America or Africa

- Area 2.1.3. : Optimised animal health, production and welfare across agriculture, fisheries and aquaculture
- Main line 3.1. : Animal health and non food-borne zoonoses

As a “One-Health” approach, animal and human health risks emerge from dynamic interactions between wildlife, domestic animals and humans in various agro-ecosystems and interfaces. Global changes have a significant effect on the habitat and movement of humans, animals and pathogens including their possible vectors. Today’s world is marked by unprecedented human footprint on environment with major changes in biodiversity affecting wildlife reservoirs and vectors and by health crises linked to emerging diseases. Social and environmental changes together with increasing mobility and trade dramatically facilitate disease emergence, and exacerbate sanitary and socio-economic impact. Though every country worldwide is concerned, developing countries, with their limited health systems and economic resources, are particularly vulnerable. Improving animal and human health considering the complexity of diverse interactions needs multidisciplinary approach gathering ecology (biodiversity), epidemiology (multi-hosts/multi-pathogens) complex systems, socio-economics, spatial analysis and modelling (including geographic information system, remote sensing of the environment and geostatistics), scenario-based modelling and risk analysis.

- How to integrate climatic, environmental, economic and social factors into ecological and epidemiological patterns and processes? Modeling should be used to explore the role of environmental and socio-economic factors in the spatiotemporal dynamics of emerging diseases.
- How to prevent, monitor and control these emerging infections? Recent tools Appropriate in scenario-based modeling should be developed and implemented as a way to assess the effects of control measures of emerging diseases.
- How to evaluate the efficiency of surveillance and control networks and programs? Comparable environments and diverse social contexts should be considered in order to address the complexity of the emergence of diseases. Socio-economic issues should be taken into account to improve implementation of the risk-based surveillance/control scenarios.

Funding scheme: Small Collaborative Project (SICA): LAC, SE-Asia, Africa (< 3 000 000 EC contribution)

Additional eligibility criteria

- Participants: Research effort should be shared among institutions at least from 3 continents.
- *The project should encourage involvement of private sector including SMEs in the early steps to ensure a realistic approach.in the exploitation and delivery of products*

Expected impacts

- Sub-regional/regional/global improved cooperation for emerging diseases control.
- Decision support tools and methods, i.e. cost-effective surveillance and control strategies, will be built up in close collaboration and should be adapted to each socioeconomic perspective and socio-ecological context.
- Training (undergraduate students) and workshops (graduate students) from participating countries.
- Synergy with FAO programs, Animal Health and The Millennium Development Goals.

ADDITIONAL INFORMATION

Justification

A combination of many ecological and socioeconomic factors has led to the development and expansion of agro-ecosystems conducive to the (re-)emergence and dissemination of diseases. South-East Asia is a hotspot for potential (re-)emergences and an appropriate research model, considering the high variability in human-dominated ecosystems, the high potential impact of the climate change, and the dramatically on-going biodiversity losses. It could be compared to other systems such as Africa to test the model-based approaches, but also to predict the global risk of disease spread, up to European countries. Diseases from Africa could emerge in Asia and vice-versa. The interest of regional activities is to gain insight into emerging diseases in this region by promoting university exchanges and pooling scientific synergies. For potential partners, this involves organizing and conducting research and training on a regional scale in order to propose appropriate health policies and surveillance responses. Several research activities could be developed in collaboration also with regional OIE, FAO and WHO representatives and other pre-existing networks.

State of the art

Previous EU funded projects (FP6/FP7) were one-disease approach (Avian Influenza, Swine Fever, Foot and Mouth Disease, Tuberculosis, etc.) or species-bases approach (fishes, bees, etc.). This “One health” proposal is multi-hosts, multi-pathogens approach and merges human and animal health issues.

List of potential consortium members (Tentative)

- *Kasetsart University, Thailand*
- *Mahidol University, Thailand*
- *Thammasart University, Thailand*
- *Asian Institute of Technology, Thailand*
- *National Institute for Veterinary Research, Vietnam*
- *Institut Pasteur, Cambodia and Lao P.D.R.*
- *SEARCA, SEAMEO, Philippines*
- *University of Pretoria, South Africa*
- *University of Zimbabwe*
- *IRD, France*
- *CIRAD, France*
- *CNRS, France*
- *CeTSAF, University Goettingen, Germany*

KBBE 2012 - Theme 3

Resilience and adaptation to stress in mixed agro-silvo-pastoral production systems under climate change in semi-arid regions - SICA Sub-Saharan Africa

- Area 2.1.2. : Increased sustainability of all production systems (agriculture, forestry, fisheries and aquaculture); plant health and crop protection
- Main line 2.3. : Management and use of natural resources (e.g. water and soil and functional biodiversity) in agriculture and forestry

Small-scale farmers in drought-prone areas of Sub-Saharan Africa will be among the most vulnerable to climate change. Prolonged periods without rain, unpredictable shifts of planting seasons and extreme weather events such as sporadic flooding pose new, unforeseen problems, to which farmers in their present production systems cannot react with enough flexibility. Existing projects focus on one or two component systems. To better understand the interaction between components of more complex systems, such as agro-silvo-pastoral systems, it is necessary to integrate existing single descriptive models in a multi component approach.

The goal of the project is to develop mixed agro-silvo-pastoral production systems adapted to climate stress and exploiting climate change mitigation options in semi-arid zones, suitable to be adopted by smallholder farmers. The project should optimise polyculture-animal production agroforestry systems, suitable to provide small-scale farmers with subsistence products, biomass and organic waste for energy, fodder and animal products as well as with farm-generated income in the face of forthcoming extreme weather events in semi-arid areas of Sub-Saharan Africa.

The project should consider:

- 1) Develop adapted, sustainable water management strategies
- 2) Integrate optimized components (crops, trees and livestock with improved tolerance to abiotic and biotic stresses) into a production and farm management system with high adaptive capacity, considering climate change mitigation effects
- 3) Establish integrative simulation models ranging from large to micro scale
- 4) Consider socio-economic and social issues of adoption of an improved agro-silvo-pastoral system by farmers and elaborate a suitable dissemination strategy for newly generated information.

Funding scheme: SICA, Collaborative Project (large scale focused research project). The requested European Union contribution shall not exceed EUR. 7 000 000.

Additional eligibility criteria:

Minimum number of participants: 3 from different Member States or Associated countries and 3 from different Sub-Saharan Africa.

Duration of the project: 3 to 5 years

Expected impact

Through collaboration, scientific exchange, student formation and regional and international networking, capacities of NARS will be enhanced. Farmers in the project area and beyond will profit when adopting improved agro-silvo-pastoral systems through reduced variability in food, feed and biomass production and better livestock performance under extreme climatic stress. This effect will contribute to increase food security of smallholder farmers and in rural areas of the project areas in general. The new system will be included in national and regional climate change strategies in form of recommendations to farmers for choice of a suitable production system mitigating agriculture-borne CO₂ emissions and supporting carbon sequestration. The project will provide the background for improving agro-silvo-pastoral systems with high adaptive capacity for semi-arid regions also in Asia and Latin America.

ADDITIONAL INFORMATION

References

The project contributes to meeting international and European commitments, most importantly the United Nations Framework Convention on Climate Change, the Kyoto Protocol and the European Climate Change Programme, as well as the EC Communication (2010) 127, an EU policy framework to assist developing countries in addressing food security challenges, EU-Africa Strategic Partnership Agreement, Commission White Paper on 'Adapting to climate change : towards a European framework for action COM (2009)147, and the Collaboration between Africa and Europe (Science and Technology Agreement between African Union and European Union).

Considering the outputs of

- ✓ *KBBE-2008-1-2-06: forecasting forest diversity under the influence of climatic changes and the consequences for stability and productivity of forest ecosystems (SCP) – BACCARA: Biodiversity And Climate Change, A Risk Analysis*
- ✓ *KBBE-2009-1-2-09: Impact and development of Conservation Agriculture techniques in developing countries (CSA-SA; mandatory ICPC) – CA2AFRICA: Conservation Agriculture in AFRICA: Analysing and FoReseeing its Impact - Comprehending its Adoption*
- ✓ *KBBE-2008-1.2.05: improved agro-forestry systems for sustainable farming (SCP-SICA) - FUNCiTree: Functional Diversity: An ecological framework for sustainable and adaptable agro-forestry systems in landscapes of semi-arid and arid eco-regions*
- ✓ *KBBE.2010.1.2-01: Integrating mitigation and adaptation options for sustainable livestock production under climate change (CP-IP-SICA) – ANIMALCHANGE: AN Integration of Mitigation and Adaptation options for sustainable Livestock production under climate CHANGE*
- ✓ *KBBE.2010.1.2-03: Sustainable water resources management and Soil fertility conservation for food production in Africa (CP-IP-SICA) EAU4Food: European Union and African Union cooperative research to increase Food production in irrigated farming systems in Africa*
- ✓ *KBBE-2009-1-2-05: Water stress tolerance and water use efficiency in food crops (LCP) – DROPS: draught-tolerant yielding plants*
KBBE-2009-1-2-05: Water stress tolerance and water use efficiency in food crops (LCP) – DROPS: draught-tolerant yielding plants
- ✓ *ENV.2010.1.3.3-1 Early warning and forecasting systems to predict climate related drought vulnerability and risks in Africa*
- ✓ *ENV.2010.2.1.1-1 Integrated management of water and other natural resources in Africa*

European added value

European collaboration in Africa will be improved through collaborative efforts to achieve a common goal, avoiding duplication of work and parallel ongoing initiatives. European scientists working on single components of the system will be enabled to position their work in a wider framework, to validate their results under field conditions and to produce results for publication and implementation. The project will contribute to increased food security in drought-prone areas of Africa. It supports the European strategy by its potential contribution to climate change mitigation. It plays a role in supporting the global responsibility of EU, and will contribute to achieve the MDGs.

Expressed interests by

- IITA, ICRISAT, ILRI, ICRAF
- NARS in West/East/Southern Africa (FARA, CORAF, ASARECA, SADC)
- CILSS, AGRYMETH
- CeTSAF, University Göttingen -Germany
- University Hohenheim - Germany
- CIRAD – France
- IRD - France

KBBE 2012 - Theme 4

Innovative methodologies for information and decision support systems to improve risk management control of climate change impacts on agricultural production systems in Latin America – SICA Latin America

- Area 2.1.2. : Increased sustainability of all production systems (agriculture, forestry, fisheries and aquaculture); plant health and crop protection
- Main line 2.1. : Strategies for adaptation to and mitigation of, climate change

Climate change is a major problem affecting the sustainability and profitability of production systems in Latin America. It will affect a number of ecosystems and sectors in the region over the coming decades, with specific and varying impacts on agriculture. Countries in the region have been developing action plans to reduce the vulnerability of systems. Some modeling is already ongoing. However, future climate projections still present uncertainties at local, national and regional levels and are still high in relation to precipitation. As such, the main objective of this project is to develop innovative methodologies for information and decision support systems to assess vulnerability and climate change impacts, in order to be able to adapt agricultural production systems contributing to food security and competitiveness of agricultural sector in Latin America.

Early warning decision support systems will combine climate, crop and pasture and management modeling. Methods, models, data sets and decision support tools, will improve the understanding on climate change impacts, vulnerabilities and risk management. Yield gap analysis will be implemented in the context of each region/farming system under current and future climate to quantify exploitable yield gaps and benchmark productivity to establish economic profit and risk analysis. It should help for developing effective targeting of appropriate investments and local and national policies to ensure adequate and proactive mitigation and adaptation strategies and actions.

Funding scheme: Collaborative Project (small or medium-scale focused research project). The requested European Union contribution shall not exceed EUR 3 000 000.

Additional eligibility criteria:

Minimum number of participants: 3 from different Member States or Associated Countries and 3 from different ICPC from the LAC region countries. SME partner involvement is highly recommended. Integration with ongoing relevant regional initiatives is important.

Expected impacts:

- Results will generate improved capacity of policy makers, agencies and scientific community to assess socioeconomic and environmental risks of climate change on agricultural production systems at regional and local scales.
- Quantification of risk for insurance companies for the different cropping and production systems at region/farming systems scale
- Enhanced capacity of farmer communities to identify potential weaknesses of their systems and plan technological responses to overcome climate impacts;
- Effective targeting of appropriate investments and policies to ensure adequate and proactive mitigation and adaptation strategies and actions at local and national level;
- Better assessment of adaptation and vulnerability for crop and pasture systems to different scenarios of climatic change risks.

ADDITIONAL INFORMATION

Relevance to ongoing projects:

- FP7 KBBE project *Animal Change: An integration of mitigation and adaptation option for sustainable livestock production under climate change*, involving amongst others, Europe and Brazil (UFRGS and Embrapa).
- ANR project (*Environmental Efficiency and livestock productions for sustainable development*), with comparative challenges, but not focusing on LAC.
- CIAT ongoing projects in Central America, Colombia, Andean region.
- Research groups of impact modelers involved in past EU projects (FP5 to FP7) or on-going: PRUDENCE, CLAIRE, ENSEMBLES

Countries of interest in LAC:

Argentina, Uruguay, Brazil, Chile, Colombia, Paraguay...

Expressed interests by:

- CORPOICA, Colombia,
- National Agricultural Research Institute (INIA), Uruguay
- University of Chile, Chile
- INTA, Argentina,
- ORA, Argentina
- EMBRAPA and IAC, Brazil
- CIAT, Colombia,
- EU members involved in climate change projects
- Also CIRAD, France; CEIGRAM-UPM, Spain, WUR/TNO/UT, Netherlands
- National Insurance companies

KBBE 2012 - Theme 5

Exploiting genetic diversity of major cereals for sustainable intensification of agriculture production under climate change constraints (Mandatory ICPC) – SICA South-East Asia, Latin America

- Area 2.1.2. Increased sustainability of all production systems (agriculture, forestry, fisheries and aquaculture); plant health and crop protection
- Mainline 2.5. Increased plant resource efficiency: adaptation of plants, crops and forest trees to biotic and abiotic stress

Cereals are the basis of food safety worldwide, both in terms of human nutrition and source of income for many populations. Future climate scenarios predict an increase in air temperature as well as reduction and greater variability in rainfall. These changes could be particularly harmful to cereal yield as they will generate a wide range of combinations of abiotic stresses to which the actual popular varieties grown in the main cereal producing and consuming countries are not adapted.

The project aims at generating the current lacking knowledge, and developing methodologies and tools to tackle the interaction of abiotic stresses (i.e. heat and drought) in cereals of major importance to European markets. The outputs of the project shall provide the foundation for defining ideotypes and developing new stress tolerant, water use efficient varieties. An integrated scientific approach should be adopted, taking into account plant escape, avoidance and tolerance strategies. The relevant genetic diversity should be characterized and traits of interest and some candidate genes should be identified for both local ICPC and European varietal improvement. These practical tools and methodologies should be developed to assist breeders through an integrated breeding approach.

The project should explore the major hot spots of cereal biodiversity (i.e. Latin America, South-East Asia, and possibly other zones) where future European climate conditions can be anticipated. It is recommended to consider a set of experimental sites with diverse climate conditions that will provide a relevant setup to discriminate genotype adaptation strategies and plasticity.

A convincing strategy for the effective dissemination, exploitation, take-up in practice and mainstreaming of results is essential. The establishment of generic approaches for the benefit of other cereal crops of strategic importance in distinct environmental regions is highly recommended.

Funding Scheme: Collaborative Project (small or medium-scale focused research project) for specific cooperation actions (SICA) dedicated to international cooperation partner countries

Additional eligibility criteria: the project financed under this topic should mandatorily link up with the *KBBE.2011.1.1-02 topic "Integrated approach to studying effects of combined biotic and abiotic stress in crop plants"*. The new project should take into account the outputs generated by the *KBBE-2009-1-2-05 Water stress tolerance and water use efficiency in food crops (LCP) – DROPS*.

Expected Impact: *The main expected impact is the establishment of a knowledge basis for breeding programmes on climate change resilient cereals for which interaction between physiologists and breeders is essential. The developed knowledge, methodologies and tools will be part of the common public goods in terms of climate change response strategies. The project will also support efforts to achieve sustainability of primary food production in Europe as well as in other regions. As such, it will be of use for cereal producers and will ensure steady supply of cereals for the consumers. Especially, the urban poor will benefit from low prices for cereals. The participation of partners from the targeted ICPC countries and from Europe is important to achieve the expected impact of the research to be undertaken. Moreover, the results of the research in this topic should be clearly of interest and potential benefit to SMEs, breeding companies in particular.*

ADDITIONAL INFORMATION

Future climate scenarios predict an increase in air temperature as well as greater variability in rainfall and less availability of water for crop growth (IPPC, 2007). In particular, growing conditions in the near future will be characterized by higher night time and daytime temperature, and more frequent and intense events of water depletion. Grain yield has already suffered from such conditions. These changes will generate a wide range of combinations of stresses to which the actual popular varieties are not adapted.

The project aims at developing methodologies and tools to tackle the interaction of abiotic stresses in cereals and to support breeding for better crop tolerance under changing climates.

The project will

- 1) characterize the patterns of abiotic stresses encountered in the targeted hotspots regions,*
- 2) quantify and integrate the effects of relevant combinations of stresses,*
- 3) identify the genetic responses involved in the tolerance to abiotic stresses.*

The growth patterns of promising ideotypes shall be relevant for identifying plant escape, avoidance and tolerance strategies. The project will encompass the development of standardized protocols, the utilization of phenotyping and genotyping platforms, and the calibration of models taking care of G x E interactions.

The relevant genetic diversity shall be characterized and some candidate genes shall be identified for adapting local varietal improvement but also cereal crops in Europe to future climatic conditions. This will give a basis for developing crops with higher water use efficiency. Some practical tools and methodologies shall be developed to assist breeders in an integrated breeding approach and shall be valid for contrasted cereal crops.

Expressed interests by:

- National agricultural research institutes and academic institutions, such as:*
- INIA - Chile*
- INTA - Argentina*
- INIA - Uruguay*
- CORPOICA - Colombia*
- INFRA, Mexico*
- Cuu Long Rice Research Institute - Vietnam*
- Department of rice research - Thailand*
- University of Milan - Italy*
- Wageningen University - The Netherlands*
- Georg-August-Universität Göttingen - Germany*
- CIRAD, France*
- International agricultural research institutes and development agencies, such as CIAT, Colombia - CYMMIT, Mexico - IRRI, Philippines-*

ANNEX 2 – List of participants

Name	Organization	Country
European Commission		
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Scientists		
Dr. Steffen Abele	University of Hohenheim	Germany
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Dr. Olivier Grunberger	Institut de Recherche pour le Développement (IRD)	France
Dr. Guy Henry	CIRAD - Research Unit “Markets, Organizations, Institutions and Operators Strategies”	France / Argentina
Dr. Vincent Herbreteau	CIRAD – Director of Research Unit "Animal and Integrated Risks Management"	France
Dr. Abdulai Jalloh	African Council for Agriculture Research and Development (CORAF/WECARD)	Sierra Leone / Senegal
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Dr. Phitsanu Tulayakul	University of Kasetsart	Thailand
Dr. Reiner Wassmann	International Rice Research Institute (IRRI)	Germany / Philippines
Prof. Dr. Kerstin Wydra	CeTSAF – University of Göttingen	Germany
Representatives from Ministries		
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Dr. Béla Kardon	Ministry of National Resources	Hungary
Mrs. M. Angel. Macías García	Ministerio de Ciencia e Innovación (MICINN) - Coordinator of EULARINET	Spain
Mr. Sander Van Opstal	ERA-ARD-II Coordinator Ministry of Agriculture, Nature and Food Quality	The Netherlands
Representatives from INCO-NET projects		
Mr. André de Courville	EULARINET Project Manager for CIRAD	France
Mrs. Sandy Gore	CAAST-NET Project Manager for IRD	France
Mrs. Catherine Marquié	CIRAD - Head of Delegation for Europe	France
Mr. Sloan Saletes	SEA-EU-NET Project Manager for CIRAD	France
Mrs. Anna Schwachula	EULARINET Project Manager for PT-DLR	Germany
Mrs. Cindy Van Hyfte	EUCARINET Project Manager for CIRAD	France
Mr. Patrice de Vernou	CAAST-NET Project Manager for CIRAD	France
Mrs. Federica Prete	Agency for the Promotion of the European Research (APRE) – Coordinator of EUCARINET	Italy