Joint FACCE-JPI and Belmont Forum Call on Food Security and Land Use Change

- Call Scope

1. Background and rationale

The interactions between food security and land use, both now and over the next few decades, are of paramount interest to policy, science and society at large. These interactions have been identified as of common interest to both the Belmont Forum and FACCE-JPI and hence are the focus of this Belmont Forum/FACCE-JPI Collaborative Research Action. The ultimate goal of the present call is to rapidly evolve the knowledge base that is needed to develop innovations and support decision-making towards sustainable land use planning and practices, i.e. innovations, strategies and policies targeted at enhancing food security as well as preserving the environment.

The coming decades will see substantial growth in food demand and change in diet type. They will also see global and regional food provision becoming increasingly subject to environmental, private and political pressures. Even today, about one billion people do not have access to sufficient calories, while a further billion do not have access to a balanced diet. Current methods of producing food have had – and continue to have – a serious negative impact on the environment, with significant local degradation of soils, water resources and biodiversity in many parts of the world. Globally, agriculture and associated land-use change contributes about a quarter of all anthropogenic emissions of greenhouse gases, and significantly affects global nitrogen and phosphorus dynamics. The need to produce more food, animal feed, fibre and biofuels, as well as the need to use land for conservation or recreation will impose growing pressure on already scarce land resources to sustain ecosystem health and services. Such pressures will be exacerbated by the impacts of climate change.

This Collaborative Research Action focused on one aspect of food security: the two-way interactions between the dynamics of food systems and land use change, including the implications of the change on biodiversity and ecosystem services. Food security research is a vast agenda spanning political, economic and social issues related to sustainable food production and above all to access to food in terms of quantity as well as of quality. Trying to access all the complexity in one call would be virtually impossible. Land-use, and especially change in land use, is arguably the most significant driver of environmental change as it leads to many of the main areas of concern: loss of biodiversity, greenhouse gas emissions, soil degradation and alteration of hydrological cycles. Land-use change is occurring worldwide due to human development dynamics. It ranges from whole-scale changes in land cover (e.g., from natural forest to grassland/cropping, '*extensification*') to changes in the intensity of cropping on a given site (e.g., from one crop per year to two crops per year, '*intensification*'), as well as changes in the type of cropping on a given site (e.g., from food crops to energy crops), or from crop production to conservation. The nature of changes in the farming technologies and practices employed (e.g., the use of fertilizers, soil and water management, rotations, set-aside) can differ substantially in their effects on carbon storage, biodiversity, hydrology, and so on.

Change in land use also impacts access to food. It is a major driver of social change, especially since social systems translate into specific spatial organization patterns (e.g. multifunctional land areas versus specialised land areas; individual property rights versus customary rights, etc.). Land use change impacts livelihoods and economic systems, migration patterns and social cohesion, and on

cultural norms and preferences. Along with land use change, social and economic value systems can change; markets and trade opportunities can open and close; and political, economic, cultural and social capitals can all be gained and lost.

Many nations are grappling with the research challenges presented by this complex agenda. In order to add value to individual nations' efforts, this Belmont Forum/FACCE-JPI collaboration will focus international effort on enhancing understanding of the diversity of spatial scale interactions between land use change and food security dynamics.

This Belmont Forum/FACCE-JPI collaboration will contribute to the new global platform Future Earth (launched at Rio+20), and where appropriate will enhance collaboration for the Climate Change, Agriculture and Food Security program (CCAFS)[1] as well as the Global Land Project[2].

2. Objective and Fundamental Questions

Recognizing that the issues of food (in)security are of local relevance, driven by both local, regional and global forces, that changes in land use are local in character but some of the driving forces are regional or global in nature, that food systems are influenced by land use types and changes thereof and that some actions taken to ensure/improve food security influence land use and changes thereof, it is the objective of this call: **To increase scientific understanding of the dynamic spatial scale interactions between food security and land use in the context of global change, and the consequences of these interactions for climate, ecosystems and social systems, including their economic and cultural dimensions.**

Under this Collaborative Research Action, with its overall focus on food security, this 2013 call emphasises three fundamental topics:

- Land use change impacts on food systems
- Food systems dynamics as driver of land use changes
- Feedback loop interactions between land use change and food security dynamics

We call for innovative and collaborative international research to investigate local/regional/global interactions of land use change and food security. Such research must go beyond individual national efforts, and should demonstrate sharing of ideas, resources, and research facilities to mutual benefit.

3. The research approach

Project proposals should be flexible in spatial scale and chosen territories, but should demonstrate a multi-scale approach, either vertical interconnections between local/regional/global dimensions or horizontal trans-boundary interconnections. They should focus on time scales of up to a few decades (in the past or/and the future).

Each project must include international trans-disciplinary and multi-stakeholder participation in co-design and co-implementation. Research outputs should be targeted towards decision-making (including public, private and communities) and innovation (technological, organisational and institutional), recognising the complexity of the associated decision-making processes and innovation challenges. Proposals must integrate natural and social systems and must examine a variety of coupled interactions and feedbacks among relevant systems.

[1]Where proposals align with the CCAFS programme, CCAFS will consider supporting proposals through access to site data, to partnership learning networks, and to science-policy dialogues.

[2]The Global Land Project will consider to endorse projects that contribute to its objectives, providing access to its wider network, dissemination activities as well as support for coordination and synthesis activities.

Proposals seeking to address the substance of this call must include one or more of the following components: development of a conceptual issue; exploration of technical and/or policy innovation and development; institutional and governance issues relating natural resources and food systems. They could use various approaches, if relevant, such as synthesis of existing knowledge, gathering new data, improving specific process understanding, model development and evaluation, scenario analysis, etc.; as well as tools such as institutional surveys and mapping, mentoring activities, methodological development, network establishment, policy drafting workshops, project support for managers and IT staff, summer schools, etc.

Clear added value of the international consortium should be demonstrated and, if relevant, the added value for national investments.

4. Call process

Recognizing that there is a need for adequate interdisciplinarity and end user community engagement, there is the need to promote the building of communities/networks that effectively engage relevant stakeholder groups. Interdisciplinarity and stakeholder engagement is likely to be fostered within community building projects, and requires time to engage people and raise trust. Conversely, it is recognised that there may be networks established from previous initiatives which are ready to embark on large scale projects.

Thus, this call offers two types of project:

- *Type 1: 12 to 18 months for up to EUR 300k*
  These short-term exploratory projects seek to build communities that bring on board various disciplines and stakeholder groups around a common object of research. The focus should be on networking, capacity building, co-design of research questions and co-building of methodologies for integrated research, spatial scale interaction analysis, knowledge appropriation by key users, etc.

- *Type 2: 3 to 5 years up to EUR 3 million*
  These projects will seek to address the key research questions in an integrated manner, with emphasis on a multidisciplinary and multi-stakeholder approach in co-design and co-implementation. Proposals should seek to enhance fundamental understanding of the complex interactions between and within natural and human systems specifically in relation to food security and land use. The proposals must include stakeholder involvement from the outset and must have a clear plan for how the results would be used.

5. Country participation

Funding should support researchers to cooperate in consortia consisting of partners from at least three of the participating countries. Moreover, so as to benefit from the additional geographic breadth brought by the link between the Belmont Forum and European FACCE-JPI, all proposals including FACCE-JPI countries should also include at least one Belmont Forum country which is not a member country of FACCE-JPI.

Researchers from countries not represented by any of the Partner Organizations can participate in the research project at their own expense. Each consortium must also show clear links to users and include collaboration between natural and social sciences, and other sciences where relevant.

Where appropriate, some Partner Organizations could also support capacity building in some developing countries.