



## Research Networking Programmes

Short Visit Grant  or Exchange Visit Grant

*(please tick the relevant box)*

### Scientific Report

**The scientific report (WORD or PDF file – maximum of eight A4 pages) should be submitted online within one month of the event. It will be published on the ESF website.**

**Proposal Title:** The Role of Farm Animal Genetic Resources for Sustainable Intensification

**Application Reference N°:** 4576

#### 1) Purpose of the visit

The objective of my visit was to gain a closer insight about the theoretical background and analytical methods and approaches that are used by social and natural scientists at the Université catholique de Louvain (UCL) in relation to sustainable agricultural systems. Particularly I was interested in comparing a number of available and tested socio-economic decision-support methods with respect to their capacity in incorporating various dimensions of sustainable intensification and to identify and discuss their application to farm animal genetic resources (FAnGR).

#### 2) Description of the work carried out during the visit

I spent a period of 4 weeks (28th April to 23rd May 2014) at UCL with Professor Philippe Baret in his lab in Louvain-la-Neuve. During the first week of my visit, I conducted a literature review focusing on ‘sustainable intensification’ (e.g. Godfray & Garnett 2014), ‘ecological agriculture’ (e.g. Weiner 2003), ‘transitions and systems changes’ (e.g. Geels & Schot 2007) and ‘economic theory of biodiversity preservation’ (Weitzman 1998).

In the second week, I read and learned about ‘cognitive mapping approach’ that is considered as a decision-support tool that was recently applied to analysing systems of practices in social-ecological systems by Vanwindekens et al (2013) and Vanwindekens et al (2014). Also in the second week, I met Dr Muriel Tichit (director of research at

INRA) and discussed about the details of my research particularly the components of sustainable intensification.

In the third week, I visited the Biodiversity governance (BIOGOV) research unit of UCL and met the head of the unit, Professor Tom Dedeurwaerdere, and his fellow researchers. In my one day visit to this research unit I became familiar with a range of research topics including: environmental ethics, philosophical views on disagreement in science and Putnam's epistemological shift, geographical indication and intellectual property, convention on biological diversity (Nagoya protocol), environmental justice, governance of collective actions (e.g. farmers collective actions for biodiversity) and the impact of specialised knowledge brokers on the adaptation of greening measures. Based on the activities in the previous three weeks, I wrote and submitted an abstract to Frontiers journal entitled "Comparing decision-support systems for sustainable intensification: an application to FAnGR".

In the fourth and last week of my visit I started to expand the submitted abstract to be able to discuss the first draft with Prof Baret while still in UCL.

### **3) Description of the main results obtained**

The conducted literature review, the scientific meetings attended and the discussions I had with a number of professors and researchers at UCL provided me an insight on the concept of sustainable intensification and its related criticism as well as on application of decision-support tools to socio-ecological systems and issues such as animal genetic resource conservation issue. These insights are presented and discussed in our forthcoming paper. The abstract of this paper is presented below):

Sustainable intensification (SI) is a multifaceted concept incorporating the ambition to increase or maintain the current level of agricultural yields while reduce negative ecological and environmental impacts by using a broad range of production methods and consumption patterns. Integrated analytical methods such as econometric methods, optimisation models, non-market valuation, and many other methods have been used to support decision making processes at different levels of agricultural systems. However, their capability in adapting to a holistic view of agricultural systems (in oppose to a reductionist view) to fulfil objectives of SI varies considerably. Further, these methods often consist of set of values, objectives and implicit assumptions that may be inconsistent or in conflict with merits and objectives of SI. These potential conflicts will have consequences for adoption and up-take of agricultural research and technologies such as genetic technology in pursuit of SI. Interdisciplinary research that integrates natural and social sciences is needed to provide guidance on feasibility, practicality and policy implementation for SI. The objectives of this paper are to compare a number of available and tested socio-economic decision-support methods with respect to their capacity in incorporating various dimensions of SI and to identify and discuss their application to FAnGR.

### **4) Future collaboration with host institution (if applicable)**

We identified and agreed on two main areas of: 1- PhD/MSc student exchange and 2- developing joint proposals that both parties (UCL and SRUC) could collaborate in future work.

**5) Projected publications / articles resulting or to result from the grant (*ESF must be acknowledged in publications resulting from the grantee's work in relation with the grant*)**

The above mentioned abstract was accepted, on 30th May, and we were invited to submit a full article for peer-review by 30 September 2014. The work on this paper is currently under progress.

**6) Other comments (if any)**

I would like to express my sincere appreciation to my host researcher Professor Philippe Baret whose scientific knowledge and broad view and experience was a great support for me during my visit to UCL. Despite of time constraint with Philippe's help, I managed to come up with a research plan and take the first initial steps of writing a joint paper. I am also very thankful to staff and researchers at Faculty of biological, agronomical and environmental engineering, as well as Earth and Life Institute of UCL for their hospitality and knowledge exchange. In particular I am thankful to Sophie T'Kint, Antoinette Dumont, Dr Julie Van Damme, Dr Frédéric Vanwindekens and Prof Tom Dedeurwaerdere for all their kind helps and hospitality. I am also very thankful to the European Science Foundation for providing this exciting opportunity.

**References**

Geels, F. W., and Schot, J. (2007). Typology of sociotechnical transition pathways. *Research policy*, 36(3), 399-417.

Godfray H. C.J. and Garnett T. (2014). Food security and sustainable intensification, *Phil. Trans. R. Soc. B* 5 April 2014 vol. 369 no. 1639 20120273.

Vanwindekens, F., Stilmant, D., Baret, P. (2013). Development of a broadened cognitive mapping approach for analysing systems of practices in social-ecological systems. In: *Ecological Modelling*, Vol. 250, p. 352-362.

Vanwindekens, F., Baret, P., Stilmant, D. (2014). A new approach for comparing and categorizing farmers' systems of practice based on cognitive mapping and graph theory indicators. In: *Ecological Modelling*, Vol. 274, p. 1-11.

Weiner, J. (2003). Ecology—the science of agriculture in the 21st century. *The Journal of Agricultural Science*, 141(3-4), 371-377.

Weitzman, M. L. (1998). The Noah's ark problem. *Econometrica*, 1279-1298.