Background Note

Agenda Item: 5

To: **Agricultural Risks KN**

From: Sandrine Noël
Meeting date: 24 November 2009
Reference: NLI-AGR-09-019

Subject: **Crop research project**

| Objective

For discussion

| Comments

Ms Piccard and Mr Bydekerke, from VITO, will present the draft research project proposal that Gers CCI[1] wishes to submit in the frame of the 7th Framework European program (FP7).

The goal of the project would be the creation of new GMES services to measure the impact of meteorological changes/hazards on crops. The final clients of these services would be insurance companies in Europe.

Comments received from members in reply to NLI-AGR-09-004, and communicated to Gers CCI, are:

- It could be useful for the insurance sector
- It is not sufficient as a basis for index-based insurance systems
- The imagery resolution seems not to be as fine as necessary to give the detailed recommendation to the user to farm or to avoid some kind of losses.

| Input requested

Participants will be invited to exchange views with the project team on:

- the need of the insurance sector for this kind of services and
- the draft proposal, which was circulated as NLI-AGR-09-005 and is enclosed below for convenience

[1] In collaboration with two Belgian research centres, the CRA-W (the Walloon Agricultural Research Centre) and the VITO (the Flemish Institute for Technological Research)

Earth observation to support the development of Index-Based Insurance services for Agriculture

Project rationale

During next years, European agriculture will have to face with an increasing instability of its incomes. Farmers will be more and more exposed to risks related to prices and to climate change impacts.

Risks related to prices variability were minimized up to now by the European Community thanks to markets and prices support policies. Today, the progressive diminution in agricultural subsidies and the suppression of guaranteed prices expose the European agriculture to the evolution of the world market prices.

As a result of climate change, climatic risks tend to increase with the multiplication of extreme climatic events (droughts, heat strokes, violent rains, storms), inducing greater yield variations. Farms specialization intensifies their sensitivity to climatic risks and reinforces the need for improving revenue protection mechanisms.

In this context, a better natural risks management is needed, because combined with the prices risks, they can generate significant incomes risks.

A new regulation of the European Commission (1857/2006) makes possible for member states to compensate farmers for losses caused by adverse meteorological conditions which can be assimilated to natural disasters. As a consequence, the importance of agricultural insurances will increase in the agribusiness in particular for arable farming. This evolution will not only oblige farmers to take responsibility for managing their production risks but will also reinforce the supervisory role of administrations and the insurance sector in setting up weather insurance schemes and in developing structural tools for estimating the extend of damages.

If Earth Observation nowadays is widely used to forecast crop yields, this information source can also be used for the management of financial aids to farmers in case of losses due to weather accidents. This project will focus on the development of tools and operational services for the insurance sector and public authorities allowing natural damage assessment and control of farmers' claims for losses using multiple Earth Observation sources at regional and local scales.

To reduce the high administrative cost of traditional agricultural damages assessment, solutions need to be based on indices which are highly correlated to the expected crop yields or damages due to natural hazards and based on reliable long-term data.

This project intends to use crop indices based on the loss risk, derived from meteorology (variables such as rainfall or temperature) from agrometeorological models(indicators which include agronomic parameters relative to the crop, such as soil moisture or leaf area index) or from remote sensing (vegetation indices computed from satellite images such as low/medium resolution satellite images).

These indices will be compared to reference values derived from the historical datasets. They may be used for detection of problem areas (delay in crop growth, low relative yields, low soil moisture) and for assessment and estimation of crop yield losses. If needed (in case of local damages or discordance between the indices and the farmer's damage claim), the use of these indices can be complemented by the analysis of high or very high resolution satellite imagery.

The final objective of the project is to set up an operational crop damage information service that will enable users to retrieve information at regional level. This service will allow a better reactivity in case of crises and will increase efficiency of claims management. In particular, it will decrease the delay of the disaster identification

procedure, to facilitate the eligibility of the compensation demands, to ensure a uniformity in the claims treatment and in the estimate of losses, and finally to reduce the payment delay.

Crop damage risk monitoring will be based on the use of medium resolution imagery (MODIS-250m) while traditionally low resolution imagery (1km SPOTVGT or NOAA-AVHRR) is used. The approach is also new in the sense that it exploits a wide range of remote sensing (including SAR) and other information products at different scales in order to map and quantify possible yield loss factors.

The supply of reliable historical crop data, making it possible to define risk levels, will also facilitate a successful implementation of new tools and the development of new crop insurance products.