



**Crop Monitoring as an
E-agricultural tool in
Developing Countries**



DISSEMINATION PLAN AND UPDATED REPORT

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Executive Summary

The dissemination activities of the project aim to

- (1) support the core activities which are the transfer of European crop monitoring technology in two developing regions and knowledge transfer in a third country. These supportive activities are implemented by means of training and networking local scientists and experts and by promoting the relevance of the technology to the local stakeholders, particularly the decision-makers.
- (2) Increasing the visibility of the advanced technology by publishing the results of the project in scientific journals or by presenting the outcome in the relevant symposia or conferences.

This document **describes the activity plan** within the implementation period and the **achievements** realized during the each implementation year as well as its expected impact on the core activities.

The activities of the dissemination can be divided into four areas:

- (1) general public dissemination through a dedicated web-site, a project folder and regular updating of these media
- (2) academic-focused dissemination by organizing the thematic workshops and presenting the project's results in diverse international conferences. The academic-focused dissemination includes also publication of most relevant results in scientific journals.
- (3) stake-holder-oriented dissemination through publication of crop yield forecasting bulletins, especially in Morocco, using the technology transferred or developed in this project. This category of activities includes also a regular contact and results presentation to the policy making authorities such as DG-AGRI of the Commission or the Ministries of Agriculture in collaborating counties (Morocco, China and Kenya).
- (4) collaboration-oriented dissemination through establishing common used tools or platforms, or jointly organising the training sessions with other EU funded projects.

The dissemination activities are mostly described in the work-packages of 7.1 and 7.2 of the Description of Work and some activities are included in the WP10 dedicating to the coordination work of the project.

1 Relevance of the dissemination activities

The dissemination activities of this project are relevant as they will:

- **support the deployment of the core activities** aiming to transfer the advanced Europe crop monitoring technology to three developing regions and to draw the feedback and added values of such implementation for European scientific community. This support will be achieved by organizing the training and capacity building activities among the local scientific and expert community and strengthen their advisory role in their local policy making process.
- **raise the visibility** of the European crop monitoring expertise amongst the international agricultural research community and amongst local stakeholders in their tasks of reviving the rural economy, consolidating and strengthening the position of agriculture as the foundation of the national economy.

2 Dissemination activity planning

2.1 Dissemination oriented to the general public

The planning for a dissemination oriented to the general public include:

- Establishment of a informative project website (www.e-agri.info). Information harboured by the site is divided into eight sections: summary, background, study areas, objectives, activities (work-packages), meetings, contact and organization (partners of the project). The sections of “activities” and “meetings” will be updates regularly, and the photos and presentations from different meetings are to be added. Upon the agreement from the authors, the deliverables with no confidential restriction can be added.
- Creating a two-page flyer providing to readers at a glance some basic information including the scale of the funding, the composition of the partnership, the technologies behind the project and the expected results.

The website will be frequently updated including a major updating once per year and minor updating several times per year. The coordination of the project will look for a possibility to include a web analytic functionality in the website such as “[Google Analytics](#)”.

At the end of the implementation, it is expected to distribute 50-100 flyers in each attended symposium or conferences and to have more than 5 web links harboured by other websites dedicated to food security or crop monitoring issues.

2.2 Dissemination at academic level

This planning of activities consists of:

- **Organizing our own thematic workshops:** as the transferred technologies are structured into five work-packages: CGMS application, BioMA platform, crop yield forecasting using remote sensing, crop area estimation and statistical tools, the project coordination schedules to organize five thematic workshops or seminars during the 36 months of implementation, in order to build up the knowledge and the operational capability for local scientists and experts and to raise the awareness of European technology in local agricultural research communities. These workshops or seminars are scheduled:
 - Workshop on crop yield forecasting using remote sensing scheduled in October 2011, organized by INRA and VITO.
 - CGMS workshop scheduled in November 2011, organized by AIFER and SDLO

- Workshop on CGMS statistical toolbox scheduled on February 2012 and organised by SDLO and INRA
- BioMA workshop scheduled in December 2012 organized by UMIL and JAAS
- Seminar on crop area assessment scheduled in February 2013, organized by CAAS.
- Organizing the ad hoc trainings for individuals or a small groups of experts from the local partner institutions, according to their needs during the implementation process.
- participating the international events (symposiums or conferences) by major national/international agencies in the field of food security, agricultural research or remote sensing and presenting the projects results
- submitting scientific papers for publication.

During the 36 months of implementation, the coordination plans to attend at least five major international conferences or symposia and present the project outcome. The Consortium has also the ambition to publish three international peer-reviewed papers with the project results.

The announcement of the workshops or seminars will be large enough to reach the local research communities, so that an effective participation of 10 to 30 scientists issued from other local institutions will be expected according to topic of the event.

Involvement or support of EC representations or local authorities in these workshop will be actively sought.

2.3 Dissemination towards stakeholders

The dissemination activities towards the stakeholders consist of:

- **reaching the stakeholders by publishing the crop monitoring bulletins**, a publication of such a bulletin will help the local policy-makers in their assessment of current local production and management of farm product supply and demand.
- **maintaining contact with the policy making authorities**, namely the Directorate General of Agriculture in the European Commission or the Ministries of Agriculture in local countries. It is already known that European Commission, in particularly the DG AGRI is very interested in this project as they are deeply involved in the collaborative activities between Mediterranean countries in agricultural domain. On the other hand, through the Joint Research Centre (JRC), which runs main European agricultural monitoring activities, the research results from this project can be rapidly disseminated and integrated into their daily operational tasks thanks to their participation of this project.

- **Networking other local institutions** to raise the awareness on the excellence and competitiveness of European crop monitoring technology

During the 36 months of implementation, crop yield forecasting bulletins based on European crop monitoring technology will be published for the first time in the technology-transferred regions. Contact with the public authorities, especially visits to the DG AGRI of the European Commission will be maintained at a level of at least once per year. Also during the implementation, exchanges with at least four local institutions specialized in agriculture or food security will be carried out and the presentation on the project will be given during the meetings.

The consortium is looking for the opportunity to network with the US Department of Agriculture. A visit to the USDA in Washington will be carried out if an opportunity arise.

The Consortium will study the opportunity/possibility of organizing a final event addressed to the stakeholders with participation of the Ministries of Agriculture from both transferred countries, Morocco and China.

2.4 Dissemination activities aiming collaboration with other European action

The synergy between different crop monitoring or food security projects can be exploited through knowledge sharing and joint organization of training with other European actions.

Such actions include “Global Monitoring For Food Security” (GMFS) funded by European Space Agency, AGRICAB and Geoland2 funded by FP7 Programme and Food Security Action of MARS unit at JRC-EC. While African continent is a common geographic area of interest, many methodologies or platforms can be shared or exchanged, such as statistical tool box or automated photo-interpretation tool. Furthermore through commonly organized training sessions or workshops by these projects, the knowledge or outcome can be better disseminated as the partners of the projects are from different organizations and from different countries.

The project will set up a collaboration with the FP7 Geoland2 project to carried out a case study for crop area estimation in the county of MengCheng, on the Huaibei Plan. The results of this particular case study will be presented at the final meeting of the project Geoland2 in October 2012.

A closed collaboration with the project AGRICAB, especially for the activities in Kenya will be actively exploited. The main objective or planning will be a joint organization of one or two workshops and joint training and capacity building activities in the domain of crop mapping, using a comparable or standardized methodological approach.

3 Dissemination activity report (updated)

3.1 Dissemination activities report for the first implementation year

The project information site www.e-agri.info was established at the beginning of the project site (Fig. 1). Information harboured by the site was divided into eight sections: summary, background, study areas, objectives, activities (work-packages), meetings, contact and organization (partners of the project). The sections of “activities” and “meetings” have been updates regularly as the implementation progresses.

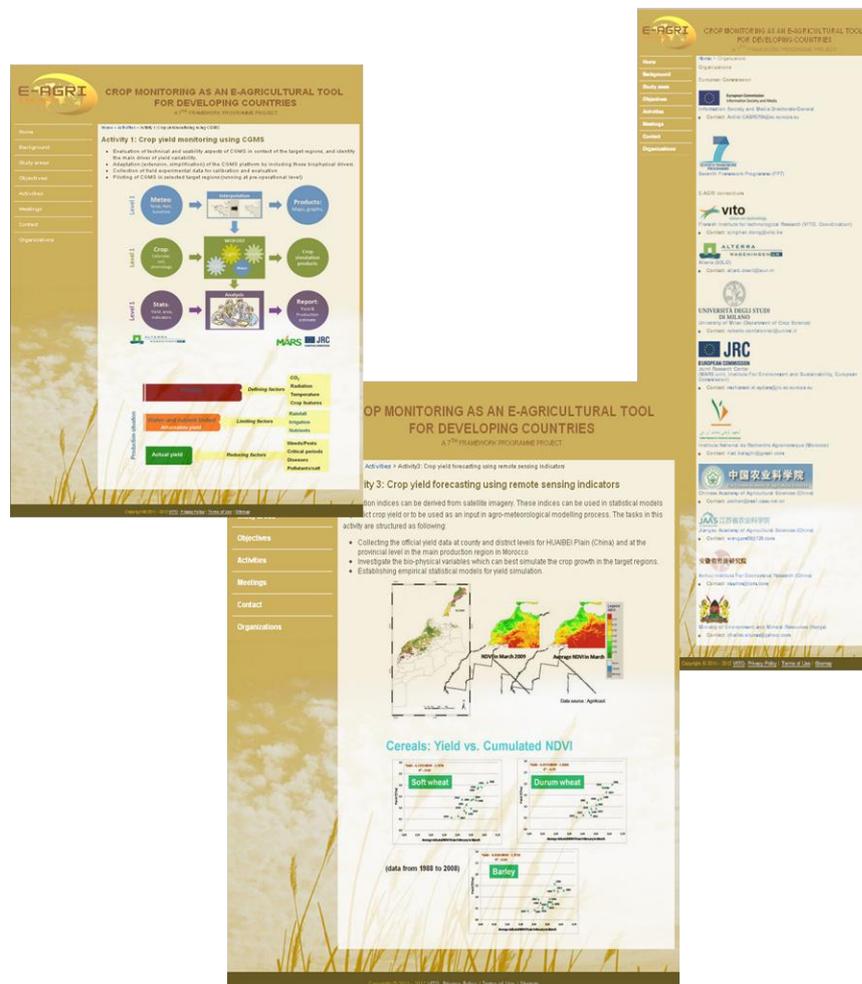


Figure 1. Screen-captures of the general web site for E-AGRI project (2011).

A folder was designed for local distribution during workshops, conferences or visits of external organizations (Fig. 2). As planned, it contains the basic numbers and information of the project and has objective to inform the readers at a glance.



E-AGRI

At a Glance

Title: Crop monitoring as an E-agricultural tool in developing countries.

Instrument: FP7, collaborative project (SICA)

Total costs: 2,302,113 EUR

EU contribution: 1,618,000 EUR

Duration: 36 months

Start date: February 2011

Consortium: 9 organisations from 7 countries or regions

Project coordinator: VITO

Project Web Site: www.e-agri.info

Email contact: qinghan.dong@vito.be

Key Words: Information and Communication Technology, agriculture, crop monitoring, remote sensing, agro-meteorology, food security

The Background And Objectives:

The innovative application of information and communication technologies (ICT) in the rural domain, with a primary focus on agriculture, is a new paradigm of sustainable development in developing economies, as more than 50% of population are still living in rural areas. The E-AGRI project aims to support the uptake of European ICT research results by setting up an advanced crop monitoring service in two developing economies, Morocco and China. The activities of capacity building will be carried out in the third developing country, Kenya, to raise the interest of local stakeholders on European E-agricultural practices and to pave the way for an eventual technological transfer in the future.

Methodology

The E-AGRI assess the crop growth conditions and forecast the crop yields using:

- > Agro-meteorological modelling
- > Indicators derived from remote sensing

It takes also advantage of the approaches based on ground survey and satellite image analyses to estimate the crop acreage in the study areas.

Furthermore, the project entails an important component of knowledge dissemination, networking and capacity building. These activities will be implemented through the dedicated training courses and thematic workshops as well as agricultural bulletins in different countries.

Partner Organizations	Countries/Regions
Flemish Institute of Technological Research (VITO)	Belgium
SDLO (Alterra)	The Netherlands
University of Milan	Italy
Joint Research Centre - European Commission	European Union
Institut National de la Recherche Agronomique (INRA)	Morocco
Chinese Academy of Agricultural Sciences (CAAS)	China
Anhui Institute for Economical Research	China
Jiangsu Academy of Agricultural Sciences	China
Ministry of Environment and Mineral Resources	Kenya

SEVENTH FRAMEWORK PROGRAMME

E-AGRI
E-Agriculture

European Commission
Information Society and Media

Figure 2. Project folder highlighting the content in a nutshell.

The folders was printed 100 and then 200 copies and were widely distributed during the various conferences especially in food security events. The folder was also included in the promotional bundle of the coordinating institute.

During the first year of implementation three thematic workshops were organized. The very first objective of these workshop is to strengthen the knowledge and capability of local scientists and experts in the domain of crop monitoring. The workshops included:

- Rabat workshop on crop yield forecasting using remote sensing (October 2011)
- Hefei workshop on CGMS setup (November 2011)
- Kenitra workshop on statistic tool box (February 2012)

The Rabat workshop was the first workshop organized by the project. Due to a large announcement, More than 20 researchers from outside attended the event including the Ministry of Agriculture, the National Meteorological Office, Department of Statistics, the Agricultural Normal University and even the Moroccan Central Bank (Bank Al-Maghreb). After this workshop, National Meteorological Office decided to help implementing CGMS

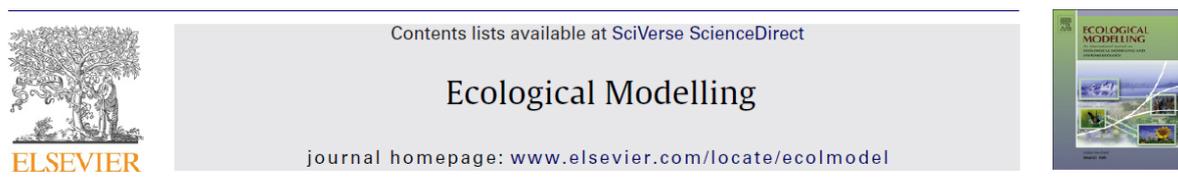
system and upgrade the implementation to an operational level. The report for this workshop can be found in the deliverable D71.3.

The EU delegation in Beijing sent its head of ITC section, Mr. Counsellor Frank Greco to the CGMS workshop in Hefei. The local government (Anhui province government) sent several officials including the deputy director of the Development and Reform Commission Mr. Wu Jingsong. The workshop was also attended by more than 30 scientists/students from Anhui Agricultural University, Xuzhou University, University of Science and Technology of China, Department of Science and Technology of the Anhui government, etc. The report for this workshop can be found in the deliverable D71.2.

The details for the Kenitra workshop can be found in the deliverable D62.1

In terms of scientific publication, a paper was published on the subject of BioMA modelling (Fig.3). The paper entitled: “Quantifying plasticity in simulation models” was published in an ISI journal “Ecological Modelling” volume 225 from pages 159-166.

Ecological Modelling 225 (2012) 159–166



Quantifying plasticity in simulation models

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Figure 3. 2012 Publication acknowledged the funding of E-AGRI project

In terms of dissemination towards the stakeholders, JRC, a member of the Consortium, visited the Moroccan Ministry of Agriculture and its Department of Statistics and Strategy (DSS). As a dissemination activity, a training of one week was planned at VITO for an expert from the Department DSS.

In terms of dissemination activities aiming collaboration with other European food security projects, a case study on crop area estimation was carried out in collaboration with Geolands2. The results was presented in the final meeting of Geoland2 project. Furthermore, methodologies were exchanged between different projects, such as the automated photo-interpretation tool developed in the GMFS project, as well as the statistical tool box developed by E-AGRI project.

3.2 Dissemination activities report for the second implementation year

During the implementation year 2012-2013, several activities of general dissemination have been carried out:

- The general project web site (www.e-agri.info) has been entirely renewed.



E-Agriculture

This project is designed to address one of the objectives of the FP7-ICT-2009-6 call, namely **the support to the uptake of European ICT research results in developing economies**. The objective will be realized by setting up an advanced **European e-agriculture service** in two developing economies, Morocco and China, by means of **crop monitoring**. The activities of capacity building will be carried out in the third developing country, Kenya, to raise the interest of local stakeholders on European e-agricultural practices and to pave the way for an eventual technological transfer in the future.

The European research institutions including VITO, Alterra, JRC and University of Milan, have developed series of agricultural monitoring approaches to support European **Common Agriculture Policy (CAP)**. These approaches are based on the European **Information and Communication Technologies including space-based Earth Observation (EO), geographical information systems and agro-meteorological modelling**. The transfer, adaptation and local application of these e-agriculture practices will assist the policy makers of developing countries in their challenge of sustaining agriculture growth. On the other hand, the feedback from this action will enhance the applicability of European crop production forecasting technology on a global scale, thus ultimately strengthen its capacity in **global monitoring of food security**.

Finally, the implementation will be strengthened by closely collaborating with other European food security projects focusing on African countries (link to African portal) such as GMFS or AGRICAB.



Figure 4. New website for E-AGRI

- There was a proposal to participate a documentary production displaying the European ITC transfer to the African continent organized by the European public television sender EURONEWS. The preparation at the test site Settat and Meteo Office in Rabat in Morocco was initiated. Unfortunately, for some budget reasons, the project was suspended in last minutes.

In terms of dissemination at academic level, the consortium published

- one peer-reviewed paper on *Agron. Sustain. Dev.*

Agron. Sustain. Dev.
DOI 10.1007/s13593-012-0104-y

RESEARCH ARTICLE

Wheat modeling in Morocco unexpectedly reveals predominance of photosynthesis versus leaf area expansion plant traits

Roberto Confalonieri • Simone Bregaglio •
Giovanni Cappelli • Caterina Francone •
Marta Carpani • Marco Acutis • Mohamed El Aydam •
Stefan Niemyer • Riad Balaghi • Qinghan Dong

Accepted: 25 June 2012
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Figure 5. New publication acknowledged the contribution of E-AGRI project

- One proceeding was published during the Dragon2 Symposium in Beijing organized by European Space Agency:
Kerdiles, H, Dong, Q., Spyros, S, Gallego, J. "crop area estimation in Mengcheng county using regression estimator"
- Four conference proceedings are published during the First International Conference on Agro-informatics organized by US Agriculture Department (USDA) in August 2012:

Di Wang, Qingbo Zhou, Zhongxin Chen and Jia Liu. "Optimization of survey unit size on spatial sampling for estimating winter wheat sown acreage"

Jianqiang Ren, Zhongxin Chen, Xingren Liu and Huajun Tang, "A new method of spatialization of crop area statistical data supported by remote sensing technology"

Zongnan and Chen Zhongxin, "Comparing two measuring methods of soil microtopography"

Di Wang, Zhongxin Chen, Qingbo Zhou and Jia Liu. "Optimal design of spatial sampling schemes for winter wheat sown area estimation"

- A book entitled "la prédiction agro-météorologique des rendements céréaliers au Maroc" was published with contribution of this project.

- A thematic workshop on BioMA platform was organized by UMI and hosted by JAAS, as a side event of the second progress meeting. More than 15 students /researchers from outside attend the workshop. The details of the workshop are described in the deliverable D71.2.



Figure 6. BioMA workshop held in Nanjing in December 2012.

In terms of dissemination towards the stakeholders, following activities were carried out:

- a first bulletin for crop yield forecasting in Morocco was published on April 17, 2012 **based on E-AGRI methodologies** (Fig. 7). The second bulletin will be published in April 2013. The publication will be for the first time using CGMS-MAROC, the CGMS system adapted and calibrated using local weather, soil and plant (phenological) data. CGMS-MAROC is one of the major outcome of the E-AGRI project and its dedicated web site (www.cgms-maroc.ma) is under construction.
- a training session for an expert from the Moroccan Ministry of agriculture was organized at VITO in May 2012. A second training session for Morocco stakeholders will be organized in May 2013.
- a briefing of E-AGRI project to the DG AGRI of the European Commission was organized on Feb. 7, 2013. A more official lecture on E-AGRI project will be given to a bigger audience at DG AGRI later in 2013.

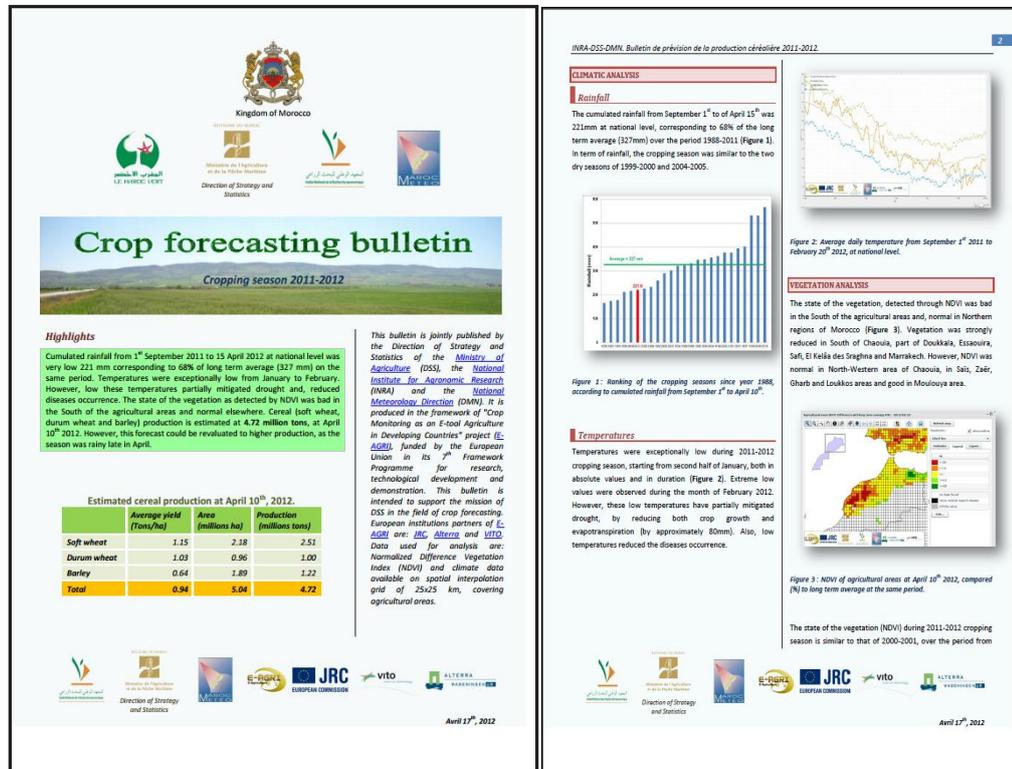


Figure 7: First crop yield forecasting bulletin for Morocco.

- Networking and dissemination activities were realized by exchanging visits with other experts outside of the Consortium. VITO visited two agricultural universities in China (Anhui Agricultural University in March 2012 and China Agriculture University in June 2012). The Centre Royal de Télédetection Spatial visited VITO in November, 2012. The E-AGRI project was presented during these exchange visits.



Figure 8: Exchanges visits with two agricultural universities in China

In terms of collaboration with other European projects on food security, a closed collaboration with the AGRICAB project was set-up with a clear planning and task sharing (Annex). The major dissemination event in this aspect was the Kenya National Workshop organised jointly by the projects AGRICAB and E-AGRI. The local partner, DRSRS, under auspices of the Ministry of Environment and Mineral Resources, in collaboration with VITO, ALTERRA, and Consorzio ITA, organized a one day workshop on the Tuesday 23-10-2012 (Fig. 9). The main objectives of the workshop was to analyze the present agricultural statistical systems in Kenya, with a focus on crop monitoring and area estimates. The workshop aimed also to help defining user needs and possible linkages with the estimate of crop yields and early warning, and enhancing the role of remote sensing in crop production monitoring in Kenya. The detailed programme and minutes are annexed to the Periodic Report 2013.



Figure 9: The Kenya National Workshop was held in Nairobi, on October 23, 2012.

4 Conclusions (updated)

The dissemination activities are conducted to **support the implementation of core activities** with a clear objective to achieve **the technological transfer**. The main dissemination activities are specified in the work-packages WP71 and WP72, with coordination described in WP10. The resource planning for the demonstration/dissemination (WP71 and WP72) in terms of man/month has a share of 11% of the whole project, which had been clearly underestimated.

The dissemination activities can be structured around the four themes: raising general public knowledge, enhancing scientific level of our research, increasing stake-holder's awareness and contributing to the European crop monitoring expertise through collaboration. Finally, feedbacks of these dissemination activities will also enhance the European capacity of agricultural monitoring at global scale, using its own information and communication technologies.

The potential of dissemination through the project website can still be improved, by enriching the website content with the results achieved so far and embedding the website link in other food security and crop monitoring websites.

The Consortium has made substantial progress in terms of scientific publications and the dissemination in this aspect will be continued and even beyond the end of the project. This has already raised the visibility of the some institutions, partners of the Consortium, and enabled them to exploit the new research funding opportunity in FP7 framework.

Much advance has been booked also in terms of dissemination towards stakeholders. The sustainability of the project has been demonstrated by concrete proposals to pursue some activities beyond the end of the implementation. In Morocco, the CGMS will be operationalized before the end of the project and continue afterwards, while crop yield forecasting activities based on remote sensing would be extended after the project on Huaibei plain.

Finally the feedback of the e-AGRI project has already emerged to consolidate European expertise on field of agricultural monitoring and to strengthen the collaboration with other European food security projects. The results obtained so far for rice growth simulation have already filled gaps on European expertise in this domain and found application in another project in Africa. The progress made on CGMS adaptation in Morocco has already provided inspiration for the Joint Research Centre of the Commission to improve their own system.

ANNEX:

AGRICAB – E-AGRI COLLABORATION IN KENYA

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* AGRICAB coordinator

E-AGRI coordinator

1 Introduction

The Flemish Institute for Technological Research (VITO) is leading the consortia of both the FP7-AGRICAB 'A Framework for Enhancing EO Capacity for Agriculture and Forest Management in Africa' and FP7-E-AGRI 'Crop monitoring as an E-agricultural tool in developing countries' projects. While E-AGRI focuses on crop monitoring using advanced information and communication technologies, AGRICAB aims specifically at improving the earth observation capacity to support agriculture and forestry management in Africa. The Department of Resource Surveys and Remote Sensing (DRSRS) of the Ministry of Environment and Mineral Resources (MEMR) in Kenya is a partner in both projects. Both projects target capacity building activities in Kenya, with the objective to raise interest of local stakeholders on European E-agricultural practices and to enable the local institute to independently monitor and generate information on agricultural resources, supporting therefore adequately policy makers' actions.

The DRSRS was formerly known as Kenya Rangeland Ecological monitoring Unit (KREMU), and was established in 1976 with an aim of monitoring the condition and trends of range lands through livestock, wildlife and vegetation surveys using remote sensing, aerial surveys and ground sampling techniques. Over the years the mandate of the department has expanded to include, forest mapping, land use/land cover in high potential areas and crop production forecasting for maize and wheat. Its mission is to promote creation of Geo-Spatial Information Databases for sustainable development while up-holding efficiency in its dissemination for the purpose of alleviating poverty. Its vision is to become a national focal centre of excellence in matters related to development of National Geo-Spatial Databases on most renewable and nonrenewable natural resources and environment for informed and rapid decision-making. DRSRS-MEMR is mandated with the collection, storage, archiving, analysis, updating and dissemination of geo-spatial information on natural resources for informed decision-making for sustainable management with the aim of reducing environmental degradation and alleviating poverty. As part of its objectives DRSRS aims to

develop early warning systems through crop forecasting for food security & seasonal vegetation biomass production monitoring.

2 The AGRICAB project in Kenya

AGRICAB aims at enhancing the capacity of DRSRS to address the current challenges it faces: (1) to improve its methodology for estimated crop yield through the use of crop models; (2) to improve its methodology to estimate planted area through the integration of satellite data; and (3) to get further acquainted with remote sensing based early warning techniques as to reinforce its role as a national reference institute for remote sensing.

The overall objectives of AGRICAB-WP3 'Predictive models and use cases' are: (1) to expose African partners to current state-of-the-art models and earth observation data; (2) to allow discovery of the models and data through hands-on exercises; (3) to gain experience by carrying out research and applying the models and data; (4) to stimulate the integration of the experience into operational tasks; and (5) to trigger capacity across Africa through regional training workshops. DRSRS is involved in crop production systems predictive modeling and use cases (AGRICAB-WP3.1), namely in: Task 1: Use case preparation and requirement analysis (lead: Alterra); Task 2: Crop monitoring and yield forecasting (lead: Alterra); Task 3: Agricultural mapping and early warning (lead: VITO); and Task 4: Agricultural statistics (lead: Consorzio ITA). DRSRS is also involved in AGRICAB-WP3.4 'Building on capacity – training & workshops' (lead: RCMRD), namely in the participation in tailored trainings in Europe, in the organization of national stakeholder workshops, and in the lecturing at regional training workshops in Africa.

3 The E-AGRI project in Kenya

The focus of the E-AGRI project in Kenya is on a cost efficiency study for crop mapping (E-AGRI-WP5.6). The objective of this work package is to evaluate what is the impact on the mapping accuracy when no or limited ground survey is conducted. This will be done by evaluating the impact of adding segment samples on the crop area estimation by remote sensing, followed by a cost evaluation. As the exploitability of the European technologies remains to be investigated in Kenya, capacity building activities are organized (E-AGRI-WP7.2) to raise the awareness of the local authorities and other stakeholders and to pave the way for further technological transfer in the future. Within E-AGRI a workshop on the applications of remote sensing technologies in the farming sector, and a training session on remote sensing and its agricultural application are planned. Within E-AGRI, a Crop Growth Monitoring System (CGMS) is implemented and tested in Anhui, China (E-AGRI-WP2.4, lead: Alterra) and in Morocco (E-AGRI-WP2.5, lead: Alterra).

4 Combination of AGRICAB – E-AGRI efforts in Kenya

4.1 Planning of relevant tasks in Kenya

	2011				2012				2013				2014				2015
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
E-AGRI	[Shaded area]																
crop mapping	[Shaded area]																
capacity building	[Shaded area]																
CGMS implementation	[Shaded area]																
AGRICAB	[Shaded area]																
use case preparation	[Shaded area]																
setup of methodologies	[Shaded area]																
implementation and testing	[Shaded area]																
scientific reporting	[Shaded area]																

4.2 Indicative efforts and budget

	Indicative effort (PM)			Estimated eligible costs				Requested EU contribution
				RTD	DEMO	OTH	Total	
E-AGRI	WP5.6	WP7.2						
DRSRS	10	3		72,987.00 €	29,606.00 €	- €	102,593.00 €	69,543.00 €
AGRICAB	WP3.1	WP3.4	WP4.3					
DRSRS	14	3	1	109,913.00 €	- €	53,824.00 €	163,737.00 €	136,259.00 €

4.3 Overlap of activities

An overlap of activities in Kenya between the AGRICAB and E-AGRI projects can be noted:

- Concerning capacity building
Within E-AGRI, two capacity building events are planned: one stakeholder workshop to promote the European E-agricultural tools in general and the application of remote sensing technologies in the farming sector, and one training session on the basic introduction of remote sensing and its agricultural application. Within AGRICAB, the capacity building focuses on tailored trainings in Europe, national stakeholder workshops and meetings, and regional training workshops.
- Concerning crop mapping and agricultural statistics
DRSRS is experienced in aerial surveys for crop area estimation. However, the combination of the use of satellite data and aerial photography should be tested in order to improve cost efficiency. E-AGRI-WP5.6 focuses on a cost efficiency study for crop mapping in Kenya. Within AGRICAB-WP3.1-Task 4, a use case will be implemented and tested whereby different approaches for the generation of agricultural statistics of crop planted area will be tested in specified study areas.

- Concerning crop yield modeling
Although not specifically mentioned in the DoW of the project, during the E-AGRI Kick-off meeting (March/2011), DRSRS expressed a clear preference to strengthen their activities also in the area of yield forecasting and not only crop mapping. Yield forecasting is a crucial subject in the mission of early warning against famine. Within AGRICAB-WP3.1-Task 2, a use case will be implemented and tested whereby crop yield modeling is done through weather monitoring, crop growth modeling and yield forecasting.

5 Proposal for AGRICAB – E-AGRI collaboration in Kenya

The proposal of VITO, Consorzio ITA, Alterra and DRSRS for collaboration between the AGRICAB and E-AGRI projects includes the following aspects:

- Concerning capacity building
 - The training of key personnel of DRSRS in tailored trainings in Europe (organized within AGRICAB-WP3.4, May-June/2012) on the methods, tools and data behind weather and crop monitoring and crop yield forecasting (at Alterra, The Netherlands) and on remote sensing, using time series analysis for crop monitoring, and image classification techniques (at VITO, Belgium). Moreover, Tarik El Hairech (E-AGRI, INRA, Morocco) participated at the training at Alterra, and Mostafa Tahri (E-AGRI, Ministry of Agriculture, Morocco) presented his experiences concerning the use or are frame sampling for generating agricultural statistics in Morocco during the training at VITO.
 - A joint AGRICAB – E-AGRI stakeholder workshop held October/2012, which had the objectives of (1) introducing and giving visibility to the AGRICAB and E-AGRI projects showing examples of state-of-the-art applications to the stakeholders involved in agricultural monitoring in Kenya, (2) to analyze needs, requirements and expectations of end-users and stakeholders, and (3) to have a basis to develop the research use cases in Kenya to be developed in AGRICAB-WP3.1 and E-AGRI-WP5.6.
 - A joint AGRICAB-WP3.1 – E-AGRI-WP7.2 training workshop on image classification methods for crop mapping and the improvement of cost effectiveness of crop area statistics generation (planned end of 2013).
 - The involvement of the E-AGRI project and the results generated in the thematic regional workshops to be organized in Kenya within AGRICAB-WP3.4 (planned 2013-2014).
- Concerning crop mapping and agricultural statistics
Within AGRICAB-WP3.1 three approaches of generating crop area estimation will be compared: (1) aerial photo-interpretation (as is performed by DRSRS) and ground

data for bias correction, (2) integration of satellite images and aerial photos, and (3) combination of point frame ground survey and satellite images to achieve better accuracy. During the Kick-off of E-AGRI (March/2011), it was discussed to carry out a similar pilot study in one defined administrative region. The combined budgets of AGRICAB-WP3.1 and E-AGRI-WP5.6 will therefore permit covering an additional study area (county) with high resolution satellite data (e.g. SPOT-5) and ground survey, in addition to the two study areas foreseen in AGRICAB. The result will allow a more extensive analysis of the feasibility, mapping accuracy and cost effectiveness of the different methods. Also the planned technical training workshop on image classification and the combination of ground data, aerial survey and satellite data, will be organized as a combined AGRICAB – E-AGRI effort (see above).

The work to be carried out in AGRICAB-WP3.1 will be divided between DRSRS and ITA in order to get the maximum efficiency, not only on the organizational aspects, but also from the capacity building point of view. For this reason, most of the work will be done in the form of technical workshops guided by ITA experts and participated by DRSRS technicians.

The activities foreseen are the following:

1. LULC INTERPRETATION & IMAGERY WORK: the aim of this activity is to build up a sampling frame for the 3 counties involved, and to characterize it in terms of landuse/landcover
2. PREPARATION OF GROUND SURVEY MATERIALS: topo maps, GPS, digital cameras stationery
3. GROUND SURVEY: the ground survey will be actually performed by Ministry of Agriculture extension officers with the coordination of DRSRS staff. Specific training will be organized by ITA
4. AERIAL PHOTOGRAPHY: this activity will be organized and carried out by DRSRS, but it will be coordinated in the framework of the statistics estimates
5. PHOTO INTERPRETATION of the aerial photograph will be performed in order to use those data in the estimation process. This activity is a DRSRS responsibility.
6. DATA ENTRY: all data from the different surveys will be managed in a specific database; this activity is a DRSRS responsibility, but ITA will provide methodological support and the appropriate software tools
7. CROP AREA ESTIMATION: at the end of the process estimates are calculated. This final activity will be performed by DRSRS during a specific technical workshop with the participation of DRSRS technicians and under the coordination of ITA, who will also provide specific software and methodologies.

The activities number 1, 3 and 7, and the training workshops related to these activities, were foreseen to be covered by ITA in the original AGRICAB budget. The balance of these activities, respect to what was foreseen at the beginning of the project, is therefore shifted from ITA to DRSRS. This implies a budget transfer of €7209, which has been agreed upon by all partners involved.

- Concerning crop yield modeling
Since DRSRS expressed its interest in yield forecasting during the E-AGRI Kick-off meeting (March/2011), and DRSRS is involved in yield forecasting within AGRICAB, the efforts of Alterra and DRSRS within AGRICAB-WP3.1-Task 2 will be reported as a combined AGRICAB – E-AGRI effort, in reports and deliverables of both projects as well as to stakeholders and end-users.