Joint Research Centre

Institute for Environment and Sustainability

2014 Annual Plan

EUROCLIMA programme:

Desertification Land Degradation and Drought (DLDD), and bio-physical modelling for crop yield estimation, in Latin America under a changing climate

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1. EXECUTIVE SUMMARY

1.1 Project Fiche

Administrative Arrangement number: 2013/332-909

Project Name: EUROCLIMA – Second phase- Desertification Land degradation and drought (DLDD) and biophysical modelling for crop yield estimation, in Latin America under a changing climate

Project duration: 36 months

Beginning and end date: 15/01/2014 – 14/01/2017

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Beneficiary countries: Argentina, Bolivia, Brasil, Chile, Colombia, Costa Rica, Cuba, Ecuador, El Salvador, Guatemala, Honduras, México, Nicaragua, Panamá, Paraguay, Perú, Uruguay, Venezuela.

1.2 Main foreseen actions per result

The main actions foreseen by result during 2014 were proposed in the JRC Technical Specification (Annex I - section 12 - of the Administrative Arrangement) and in principle should not change substantially unless the JRC doesn't manage to ensure the necessary human resources through the recruitment of a Contract Agent as foreseen in Annex II of the Administrative Arrangement. The following are the results to be obtained through a number of specific actions.

R1.Together with EUROCLIMA national focal points and expert network, new priorities for research on DLDD have been defined and the corresponding models and tools have been developed.

The actions foreseen regarding the above Result (R1) are the following:

- Set up of a group of EUROCLIMA – Desertification, Land Degradation and Drought (DLDD) on capacity4dev.eu (1.1.1)
- Exchange of ideas during Workshops and virtual meetings (1.1.2)
- Initiate the work towards the interpretation of detailed maps on the assessment of the H-E system productivity into dedicated land degradation maps (1.2.1)
- Initiate the development of a model for mapping drought vulnerability and risk (1.3.2)

R 2. Knowledge transfer has been accomplished through the update, maintenance and transfer to Latin American partners of the DLDD information system developed under EUROCLIMA in its first phase.

The actions foreseen regarding the above Result (R2) are the following:

- Maintain and review the current data provision of meteorological and remote sensing data (2.1.1)
- Maintain and improve the current Land Degradation, Desertification and Drought products; new products from LA national and regional institutional partners need to be raised to increase system's interoperability and prominence (2.2.1)

R3. Capacity building and South-South cooperation on DLDD has been achieved through case studies, workshops and specific training sessions.

The actions foreseen regarding the above Result (R3) are the following:

- Select Case studies on Land Degradation, Desertification and Drought as well as the experts that will execute them under supervision of the JRC (3.1.1)
- Organising the first EUROCLIMA II Workshop in Latin America on Land Degradation, Desertification and Drought (place, date and specific topic still to be decided) (3.2.1)
- Organising the first EUROCLIMA II Training on model applications on Desertification, Land Degradation and Drought (place, date and specific topic still to be decided) (3.3.1)

R4. Context-specific bio-physical modelling for crop yield estimation under climate change has been accomplished

The actions foreseen regarding the above Result (R4) are the following:

- Initiate the improvement of the BioMA modelling platform for Latin America (4.1.1)
- Initiate the context-specific crop parameterization for main crops in LA such as wheat, maize, soybean, rice, sugar cane (4.1.2)
- Consultations with expert LA partners on crop modelling (4.4.1)

2. TECHNICAL EXECUTION

2.1 Methodological Focus / Implementation strategies

The work to be done by JRC for the EUROCLIMA II project will be focused on disseminating and deepening knowledge about desertification, land degradation and drought as well as on bio-physical and crop growth modelling; the potential effects of climate change will be addressed allowing to link research results to climate change mitigation and adaptation measures, including where feasible issues of disaster risk management.

A common usage of base data and a single web portal will be developed in collaboration improving the structure of the JRC-EUROCLIMA portal.

The JRC will build on the lessons learned from the first phase of EUROCLIMA in order to develop a better coordination with the focal points and with the different members of the project (CEPAL, IICA, PNUMA and TA). The JRC will also take in consideration the suggestions

and recommendations of the focal points following the workshops in Honduras in May 2012 and in Colombia in February 2013. It will also take advantage of the different projects in which is involved with European and international scientific partners (e.g.: Aridas-LAC, MWAR-LAC, AgMIP-LAC, WAD, and GDIS).

Further development of the DLDD Observatory developed by JRC-EUROCLIMA will be done by setting up an integrated model for drought mapping, monitoring and forecasting at different spatial scales. It will also include a model for mapping drought vulnerability and risk.

The monitoring of change in land surface phenology and productivity is an important and widely used approach to quantify the state and trend of degradation of ecosystems due to climatic or human influences. During the first phase of EUROCLIMA vegetation phenology and productivity metrics for the whole continent have been calculated using satellite based time-series imagery. This information will now be improved and maps indicating with high probability the areas with on-going degradation processes will be produced based on models combining spatial variables and indicators. This will be done through integrated modelling for assessing, mapping and monitoring land degradation situations at continental, sub-continental and national scale. The monitoring of land degradation processes is of main importance to understand the areas that are at risk, and keep them monitored in time will help to evaluate if the measures taken are being effective in combating desertification and land degradation.

The analysis and evaluation, together with Latin American cooperation partners, of climate change scenario simulations will allow evaluating the impact of climate change on drought and on ongoing land degradation processes and proposing mitigation and adaptation measures.

Close cooperation with and among LA partners is crucial to the success of the project. Sustainable results can only be achieved if local partner organizations will have enough support within EUROCLIMA II that enables them to incorporate the knowledge and technologies transferred. In this proposal we include the development of a number of case studies that would allow for a close cooperation with Latin American partners.

A call for collaboration will be launched to the LA partner organizations trough the national Focal Points in order to enhance the network created during EUROCLIMA phase I and enlarging LA countries participation. In this regard, particular emphasis will be placed on disadvantaged countries and in those which have not participated in the first phase of EUROCLIMA.

Finally the project will include a number of expert meetings and training seminars on different topics of Desertification, Land Degradation and Drought. If there is interest from LA institutions, during this second phase of JRC-EUROCLIMA there will be an effort together with all stakeholders to find a LA institution that would become responsible to run and maintain the LA Desertification, Land Degradation and Drought Observatory in the future. Ideally, before the completion of this phase of the project the institution should already start this responsibility, so JRC-EUROCLIMA can accompany it in this task.

The activities crop growth modelling will be a direct follow-up of the activities performed by JRC in EUROCLIMA phase 1. The EUROCLIMA-specific modelling solution of the bio-physical modelling platform BioMA as developed and presented in phase 1 will be further enhanced and tailored to the needs of partner organizations in LA. Context-specific model calibration through data collection on main crops in main producing regions at local and regional level, combined with the use of more specific soil data will enable more accurate and reliable crop yield estimates as compared to phase 1. State of the art climate scenario data for specific regions in LA will be incorporated into the BioMA platform and further enhanced and

transformed as valuable climate forcing in climate change scenario modelling. The integration of local knowledge on agro-management will allow the exploration of adaptation options under climate change.

While local knowledge and data will be collected in collaboration with LA partners (collaboration will be sought in particular with partners engaged in the case studies), the model development, calibration, and the execution of model runs will be performed at JRC. Model results will be presented and discussed with LA partners and focal points in order to draw appropriate conclusions.

The developments of EUROCLIMA II will serve as best practice on how to implement context-specific regional and local climate change studies based on state-of-the-art bio-physical modelling of crop growing conditions.

Complementarities between EUROCLIMA II and the BASAL project will be fully explored to these projects' mutual benefit. In BASAL (also funded by DEVCO) Cuban experts and JRC researchers work together to adapt and apply at the BioMA-based modelling implementation framework to Cuban conditions, creating ownership in Cuba, and enabling the Cuban counterparts to maintain and further extend the newly developed system according to their own needs.

In case DEVCO, the Technical Assistance, IICA or CEPAL, under Component 1 or 2, organize regional training seminars aimed particularly at political decision makers JRC will give support providing information on how the results of this component can be integrated into national policies and plan on climate change.

JRC will implement the project in close collaboration with the Focal Points and other participants in EUROCLIMA (AT, CEPAL, PNUMA, and IICA) through the EUROCLIMA Coordination and Monitoring Committee. The JRC will promote synergies and complementarities with the work developed by AT, CEPAL, IICA, and PNUMA regarding the topics of climate change, sustainable agriculture and food security. Furthermore, together with the members of the Coordination and Monitoring Committee, the JRC will propose specific tools for a correct execution and coordination of EUROCLIMA such as: global and annual working plan, sustainability strategy, communication and visibility strategy, internal monitoring system. This will be discussed at the first meeting of the Monitoring and Coordination meeting and will have to be approved by the EC.

JRC will keep contact with the Focal Points in order to change information that will allow the Focal points to better understand the outcomes of the project and will allow the JRC to better understand the priorities of the countries through the opinion of the Focal Points. Although the Workshops organized by JRC are directed to technical/scientific experts in the field, if there is a specific interest on a topic a limited number of Focal Points could eventually attend these workshops (alternatively it could be envisaged to set up a webinar so all the interested Focal Points could follow the Workshop).

The technical and scientific networks established during the first phase of EUROCLIMA will be maintained and extended through a call for participation to scientific/technical Institutions that work in the thematic addressed with the objective of having participants from all the 18 countries. This call for participation will be done through

the Focal Points and through the current network members. In this regard, particular emphasis will be placed on disadvantaged countries and in those not participated in the EUROCLIMA phase 1. Furthermore synergies will be sought with other projects or initiatives already in place in Latin America regarding the same topics.

The results and models developed in the framework of the project including any software tools developed will be disseminated by the JRC with the help of the network participants and of the Focal Points. The participants in the workshops and trainings will be asked to replicate the trainings received, in the measure of their possibilities, in their countries of origin and with the support of their national Focal Points. JRC will also disseminate the results of the project through its participation in international events such as scientific conferences or workshops.

2.2 Logical Framework: Objectives and expected Results

General Objective: Facilitate the integration of climate change mitigation and adaptation strategies and measures into Latin American public development policies and plans at national and (sub) regional levels

Specific Objective: Contribute to Food security in LA by disseminating and deepening knowledge about desertification, land degradation and drought, considering also the potential effects of climate change.

Result 1: Together with EUROCLIMA national focal points and expert network, new priorities for research on DLDD have been defined and the corresponding models and tools have been developed.

Result 2: Knowledge transfer has been accomplished through the update, maintenance and transfer to Latin American partners of the DLDD information system developed under EUROCLIMA in its first phase.

Result 3: Capacity building and South-South cooperation on DLDD has been achieved through case studies, workshops and specific training sessions.

Result 4: Context-specific bio-physical modelling for crop yield estimation under climate change has been accomplished.

2.3 Main Activities and specific actions: Results 1

Activity 1.1 *Shared identification of research needs and subsequent structured exchange of ideas on research methodologies and preliminary results through varied forms of communication (blogs, virtual meetings, workshops).*

Although there has been a strong involvement of Latin American stakeholders in the definition of the proposed activities, in order to ensure pertinence and future application of research results into policies and plans, it is fundamental to ensure the consultation and continuous involvement of EUROCLIMA´s national focal points into JRC-EUROCLIMA actions. Also, maintaining channels of communication with the focal points helps the identification and participation of nationally relevant research institutions. Hence the main actions to be implemented in 2014 are:

Action 1.1.1 Set up of a group of EUROCLIMA – Desertification, Land Degradation and Drought (DLDD) on capacity4dev.eu

A EUROCLIMA group on Desertification, Land Degradation and Drought (DLDD) will be set up on the Capacity4Dev platform of the European Commission-EuropeAid. This group will allow maintaining communication among the different stakeholders involved in the project, to share information and stimulate discussion on the research topics addressed.

Action 1.1.2 Exchange of ideas through Workshops and virtual meetings

The exchange of ideas between JRC and the national Focal Points will be done through virtual meetings depending on the technical constrains of both sides (phone conferences, videoconferences) and through their participation in Workshops organised by JRC, DEVCO and the Technical Assistance.

Activity 1.2. *Development of models and tools to address the biophysical aspects of desertification and land degradation*

The development of models and tools to address the biophysical aspects of desertification and land degradation will be further discussed with the national focal points and scientific partners of EUROCLIMA in Activity 1.1. However, the main aspects proposed by JRC to be considered and that will constitute the specific actions of Activity 1.2 in 2014 are:

Action 1.2.1 Interpretation of maps on the assessment of the Human-Environment system productivity into dedicated land degradation maps
Based on partner collaboration, relevant ancillary information layers will be identified and integrated with the EUROCLIMA regional products; more detailed maps on the assessment of the Human-Environment system productivity will be done to further interpret these maps into dedicated land degradation maps. Specific methodologies will be outlined and made available to all partners for implementation.

Activity 1.3 *Development of models and tools to address the biophysical aspects of drought*

The development of models and tools to address the biophysical aspects of drought will be further discussed with the national focal points and scientific partners of EUROCLIMA. However, the main aspects proposed by JRC to be considered and that will constitute the specific actions of Activity 1.3 in 2014 are:

Action 1.3.2 Development of a model for mapping drought vulnerability and risk.
In order to assess the drought risk for a certain region, the definition of vulnerability to drought should reflect the complex interactions between and the socio-economic systems and the physical environment. Models for drought vulnerability and risk will be developed at regional level but some countries might want to develop their own models at national or more local level.

2.4 Main Activities and specific actions: Results 2

Activity 2.1 *Maintain and extend the current data provision of meteorological and remote sensing data at continental level*

Action 2.1.1 Current data provision of meteorological and remote sensing data maintained and revised
The current and/or new meteorological and satellite image providers could be contacted to establish adequate cooperation protocols; new datasets from LA national and regional institutional partners need to be raised to increase system's interoperability and prominence.

Activity 2.2 *Maintenance and review of Land Degradation, Desertification and Drought products*

Action 2.2.1 Current data products should be maintained and improved; new products from LA national and regional institutional partners need to be raised to increase system's interoperability and prominence

2.5 Main Activities and specific actions: Results 3

Activity 3.1 *Execution of specific case studies on Desertification, Land Degradation and Drought, by the members of the expert network of EUROCLIMA.*

3.1.1 Case studies proposed and executed by the members of the EUROCLIMA DLDD expert network
A certain number of case studies are proposed to be executed by the members of the EUROCLIMA expert network in communication and coordination with the national focal points. Some initial proposals have already been made during the last EUROCLIMA Workshop on DLDD that took place in Natal (Brazil) in October 2012 and these should be taken as the basis for discussion for the case studies (see minutes of the Workshop at http://edo.jrc.ec.europa.eu/scado/php/index.php?id=3208). The case studies are aimed at intensifying collaboration among network partners and at showing in practice the use of the DLDD tools. EUROCLIMA national focal points will be involved in the discussion on which case studies to execute taking in consideration the national interests and priorities of the countries together with the available resources. Ideally the case studies should be distributed in different countries and when possible they could involve more than one country (transboundary). Common indicators that allow monitoring on a regional level, linked to GIS (where possible: free, open source), will be included.

Activity 3.2 *Organising expert meetings in Latin America to promote the coordination by Latin American institutions of the scientific network initiated during the 1st phase of EUROCLIMA.*

There is one workshop foreseen to introduce LA partners to the results of the first phase of EUROCLIMA and to present and discuss results from the specific activities carried out during EUROCLIMA II.

Action 3.2.1 The first Workshop could be jointly organised with IICAby the end of August and should present the results of the first phase of EUROCLIMA and the second phase of the project to LA partners. It will be also used to find a consensus on the case studies mentioned in Action 3.1.1.

Activity 3.3 *Organizing training on tools of interest to the scientific network on Desertification, Land Degradation and Drought.*

There is 1 training activity that could eventually be organised back-to-back with the first Workshop. The experts selected to participate in the training should compromise themselves towards the national Focal Points of their country to organise a training session for national experts to be selected by the national focal points.

Action 3.3.1 The first training will be a Thematic Training on EUROCLIMA II model applications on Desertification, Land Degradation and Drought.

2.6 Main Activities and specific actions: Results 4

Activity 4.1 *Further enhancement and tailoring of the BioMA modelling platform to needs of LA partners and to local and regional conditions*

Action 4.1.1 Improvement of the BioMA modelling platform for Latin America

Following the feedback from participants of the final EUROCLIMA first phase workshop of the JRC component held in Buenos Aires in March 2013, the BioMA modelling platform will be significantly improved regarding user friendliness in order to allow faster learning and using the components and modelling solutions already available within BioMA.

Action 4.1.2 Context-specific crop parameterization for main crops in LA such as wheat, maize, soybean, rice, sugar cane

As requested by stakeholders in the final workshop of EUROCLIMA phase 1, more context-specific crop parameterization will be implemented for main crops in LA such as wheat, maize, soybean, rice, sugar cane. To this end, two external studies will deliver context-specific knowledge databases by the end of year one that allow for regional calibrations of the model for main crops under consideration. Specifications of the studies will be developed in close collaboration with partners from LA, such as INTA in Argentina or CONAB in Brazil, in order to build as much as possible on their local knowledge.

Activity 4.2 *Run state-of-the-art climate change scenarios of yield estimates for main crops in the main producing regions of LA.*

To be implemented after 2014.

Activity 4.3 *Explore adaptation options under climate change through integration of local knowledge on agro-management.*

To be implemented after 2014.

Activity 4.4 *Reinforcing partner relationships through a scientific workshop and dissemination through a scientific conference on climate change in agriculture in LA.*

For both events in LA (training workshop and scientific conference) the participation of appropriate experts from all relevant LA countries is encouraged, especially from countries that will benefit most from climate change impact studies and vulnerability assessments through bio-physical modelling exercises.

Action 4.4.1 Consultations with expert LA partners on crop modelling

The scientific collaboration with partners on crop modelling of EUROCLIMA phase 1 will be supported through involvement of agricultural and research organizations such as INTA, CONAB, and others in the set up of the knowledge databases as well as through consultations on their expertise (e.g. as Fee Paid Experts).

2.7 Calendar of Activities in 2014

This Table presents the Action plan calendar for 2014 per Result and Activity.

	2014											
	1	2	3	4	5	6	7	8	9	10	11	12
R1.Together with EUROCLIMA national focal points and expert network, new priorities for research on DLDD have been defined and the corresponding models and tools have been developed.												
1.1 Shared identification of research needs and subsequent structured exchange of ideas on research methodologies and preliminary results through varied forms of communication (blogs, virtual meetings, workshops)												
1.1.1 Set up of a group of EUROCLIMA – Desertification, Land Degradation and Drought (DLDD) on capacity4dev.eu			x	x	x	x	x	x	x	x	x	x
1.1.2 Exchange of ideas during Workshops and virtual meetings			x	x	x	x						
1.2: Development of models and tools to address the biophysical aspects of desertification and land degradation												
1.2.1 Interpretation of detailed maps on the assessment of the H-E system productivity into dedicated land degradation maps							x	x	x	x	x	x
1.3 Development of models and tools to address the biophysical aspects of drought												
1.3.1 Drought prediction using meteorological forecasting models												
1.3.2 Development of a model for mapping drought vulnerability and risk.				x	x	x	x	x	x	x	x	x
1.3.3 Climate change impact on drought												
R 2. Knowledge transfer has been accomplished through the update, maintenance and transfer to Latin American partners of the DLDD information system developed under EUROCLIMA in its first phase.												
2.1 Maintain and extend the current data provision of meteorological and remote sensing data at continental level.												
2.1.1 Current data provision of meteorological and remote sensing data maintained and revised	x	x	x	x	x	x	x	x	x	x	x	x
2.2 *Maintenance and review of Land Degradation, Desertification and Drought products.*												
2.2.1 Current data products should be maintained and improved; new products from LA national and regional institutional partners need to be raised to increase system's interoperability and prominence	x	x	x	x	x	x	x	x	x	x	x	x
R3. Capacity building and South-South cooperation on DLDD has been achieved through case studies, workshops and specific training sessions.												
3.1 Execution of specific case studies, on Desertification Land Degradation and Drought, by the members of the expert network of EUROCLIMA												
3.1.1 Case studies proposed and executed by the members of the EUROCLIMA expert network.							x	x	x	x	x	x
3.2 Organising expert meetings in Latin America to promote the coordination by Latin American institutions of the scientific network initiated during the 1st phase of EUROCLIMA												
3.2.1 First Workshop						x						
3.3 Organizing training on tools of interest to the scientific network on Desertification Land Degradation and Drought												
3.3.1 First Training on EUROCLIMA II model applications on Desertification, Land Degradation and Drought						x						
R4. Context-specific bio-physical modelling for crop yield estimation under climate change has been accomplished												
4.1 Further enhancement and tailoring of the BioMA modelling platform to needs of LA partners and to conditions local and regional conditions.												
4.1.1 Improvement of the BioMA modelling platform for Latin America						x	x	x	x	x	x	x
4.1.2 Context-specific crop parameterization for main crops in LA such as wheat, maize, soybean, rice, sugar cane										x	x	x
4.2 Run state-of-the-art climate change scenarios of yield estimates for main crops in the main producing regions of LA.	To be implemented after 2014											

4.3 Explore adaptation options under climate change through integration of local knowledge on agro-management.	To be implemented after 2014											
4.4 Reinforcing partner relationships through scientific collaboration, a scientific workshop and dissemination through a scientific conference on climate change in agriculture in LA												
4.4.1 Consultations with expert LA partners on crop modelling			x	x	x	x	x	x	x	x	x	x
5 Project Management												
5.1 Coordination with other components of EUROCLIMA	x	x	x	x	x	x	x	x	x	x	x	x
5.2 Planning	x	x	x									
5.3 Monitoring	x	x	x	x	x	x	x	x	x	x	x	x
5.4 Reporting to DEVCO						x						x

2.8 Summary of the technical execution

2.8.1 Research, studies, technical consultancy

- Start the interpretation of detailed maps on the assessment of the H-E system productivity into dedicated land degradation maps
- Start looking in possible ways for drought prediction using meteorological forecasting models
- Start the development of a model for mapping drought vulnerability and risk
- Start analysing Climate change impact on drought
- Current data provision of meteorological and remote sensing data maintained and revised
- Current data products maintained and improved
- Case studies proposed and executed by the members of the EUROCLIMA expert network
- Improvement of the BioMA modelling platform for Latin America, with special attention to user friendliness. This will be done at the JRC by intramuros consultant supervised by MvdB, on the basis of feedback received from EUROCLIMA 1.
- Context-specific crop parameterization for main crops in LA such as wheat, maize, soybean, rice, sugar cane. This will be done on the basis of literature review by JRC and regional consultant(s), complemented with model calibration exercises.

2.8.2 Capacity Building

- First Training on EUROCLIMA model applications on DLDD

2.8.3 Publications

NA

2.8.4 Conferences and Workshops

- First Workshop on DLDD
- Participate in Third International Climate Change Adaptation Conference, Fortaleza Ceará – Brazil, 12 -16 may 2014

2.8.5 Visibility Actions

- Ad hoc presentation of EUROCLIMA in a number of international symposiums and workshops

2.8.6 Sustainability Actions

NA

2.8.7 Gender Balance Actions

NA

2.8.8 Relations with the key actors

- Set up of a group of EUROCLIMA – Desertification, Land Degradation and Drought (DLDD) on capacity4dev.eu
- Exchange of ideas during Workshops and virtual meetings
- Consultations with expert LA partners on crop modelling, via e-mail, Skype and personal visit to the region

2.8.9 Hypothesis and risks

In principle all the foreseen results presented in this annual plan will be executed. However, due to the current restrictions in recruitment at the JRC it is possible that there will be a delay or that in the worst case some of the results will not be attained.

2.8.10 Observations and recommendations

The importance of the EUROCLIMA programme for Latin America and EU should be highlighted to the JRC and DEVCO Management in order to receive support for the necessary recruitment of staff.