

## Annual report on the implementation of IAI CRN3106 project

- 1. Project Title:** Transferring climate knowledge in the science-policy interface for adaptation to drought in Uruguay

**Project Number:** CRN3 106

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**Reported period:** May 1<sup>th</sup> 2015 to May 1<sup>th</sup> 2016 – Year 2

### 2. Project Funding and deadlines

USD 60,000 were received from IAI in the second year of this project (USD 38,880 in the first year). The funds are managed by the Eduardo Acevedo Foundation of the Facultad de Agronomía, UDELAR.

In kind contributions were received from the universities: UDELAR, UNIFESP, UBA, University of Miami, IRI - Columbia University; from the following governmental institutions in Uruguay: Agricultural Plan Institute, National Response System to Climate Change, Ministry of Agriculture and Fisheries, National Institute of Agricultural Research, Uruguayan Institute of Meteorology; and from the following rural organizations in Uruguay: Agricultural Cooperative of Maldonado, Rural Development Society of Pan de Azúcar, Agricultural Cooperative of Aiguá; Rural Development Society of Pan de Azúcar; Rural Development Society of Aiguá and Coronilla.

Deadline extension to 42 months is being requested. Although initially the project was scheduled to take place in 30 months, the achievement of the objectives is currently compromised by the deadlines. The justifications for this application are developed in items 3.3, 6.2 and 10.

### 3. Research Activities and Findings

The activities of the second year included the third workshop, seminars, meetings and interviews. In these activities different forms of communication were used (face to face, virtual) and were carried out with total or partial participation of the team members depending on the task assigned. The evolution of the main group activities since the start of the project to date and the evolution of the number of members appear in Figure 1.

\*All attached files are in Spanish

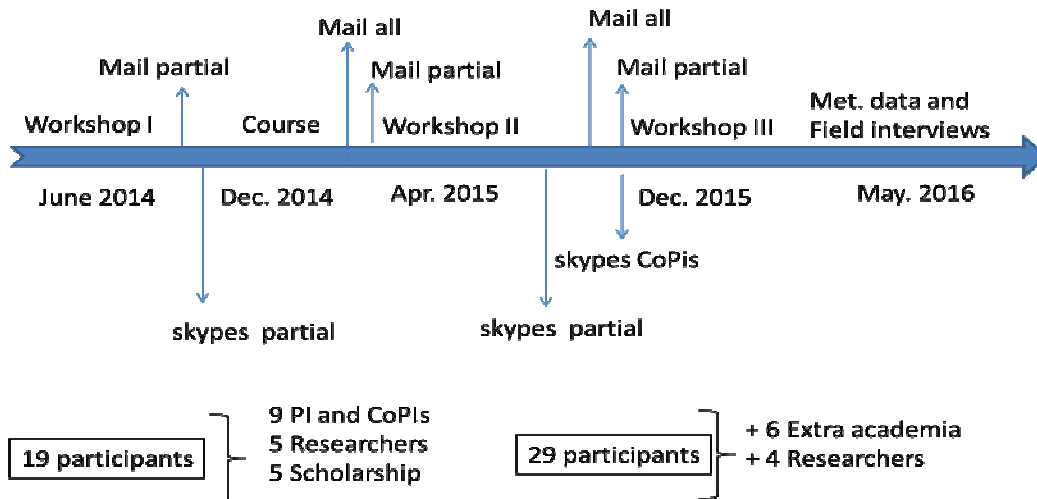


Figure 1. Main collective activities and forms of communication of the CRN3106 project from Workshop 1

### 3.1 Progress of the integration of the Project.

The integration of new participants was executed according to two important aspects for this project, graduate students and non-university actors (apart from those who were originally included in the proposal).

The goal for the proposed thesis work was to promote the interdisciplinary approach to the issues of the project ("onion diagram" because of the arrangement of concentric layers, Figure 2). The disciplinary training of graduate students is the following: two agronomists, a biologist, an anthropologist and a degree in political science. Two of them (biologist and anthropologist) perform transversal work outside their basic disciplinary field as a number of researchers do (Figure 2).

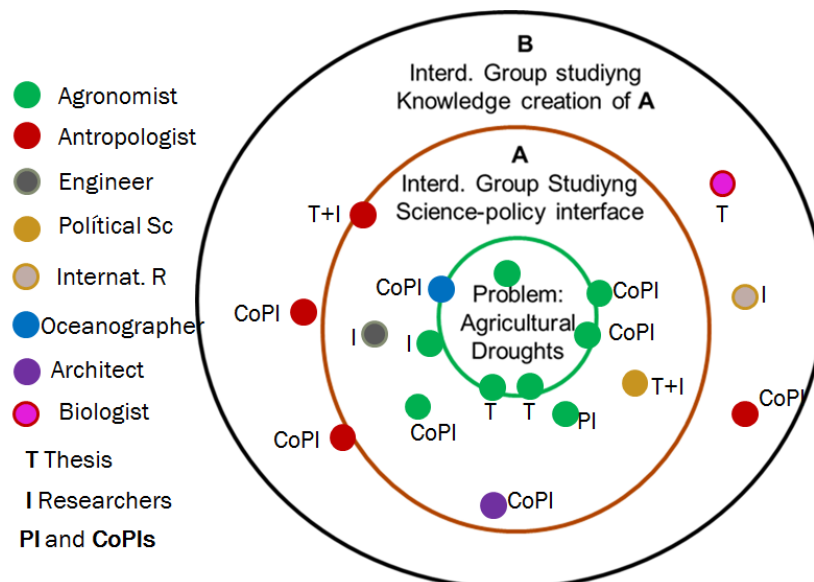


Figure 2. Disciplines of the project researchers and their distribution in each one of the themes, placed according to the model of original work.

The additional non-university members were summoned to represent Uruguayan institutions directly involved in the issues raised in the project (science-policy interface and agricultural drought, Figure 2). These institutions are: Ministry of Livestock, Agriculture and Fisheries, Institute of Agricultural Research and

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Uruguayan Institute of Meteorology (the National Response System to Climate Change and the Agricultural Plan Institute were already part of the original integration project).

Table 1 shows the description of the current integration and in Figure 1 the moment that extra-university actors were integrated in the project is presented (6 new members, listed in Annex 1). Other participants with less direct link (through meetings and interviews) are also listed in Annex 1.

Table 1. Distribution of members by discipline, function, country, institution and gender.

Agronomist	Biologist	Anthropologist	Engineer	Internac. Relations	Political Sciences	Oceanographers	Architect	Metheorologist
15	2	5	1	1	2	1	1	1
PI y CoPIs	Reaserchers	Masters Students	Extra academia	Uruguay	Argentina	Brasil	USA	
9	9	5	6*	20	6	1	2	
University	Extra University		Female	Male				
21	8		13	16				

\* Extra academia COPIS are not included in this number (list in Annex 1)

The farmers are also non-university actors and are directly involved with the problem of agricultural drought (Figure 2), in Workshop II their effective integration was identified as very important issue. The possible way of integration conceived in the current context (time and funding) is through dialogue with the already defined participants. In this modality of coproduction, called Consultative Mode, the Stakeholder input is facilitated by a social scientist or another team member who may act as a “science translator”. This mediation is carried out through interviews and visits to livestock farms in south east Uruguay by the PI and graduate students, in consultation with the COPIS, researchers and project advisors (listed in Annex 1).

### 3.2 Workshop III December 5<sup>th</sup> to 8<sup>th</sup> 2015

The workshops have represented the most important milestones; it is where all the original member of the project meets face to face and where the relationships between them become stronger, while new participants join in reinforcing the tasks. It is noted that each Workshop lasts three days, and this time is very limited to establish /strengthen linkages. Another aspect to highlight is that there are some participants who have been present in the three workshops, others have joined later or there are those who have been involved intermittently. While this has been considered as “inevitable” from the start (see project “semipermeable membrane”, etc.), it appears as an important factor as long as there are members of the project who do not know each other. The attendance instances are so importance that the Workshop III, which had been planned for October, was postponed to December due to health problems of one of the CoPI, a decision that was proved successful.

For Workshop III (December 2015) it was agreed to move forward on the systematization of information that emerged in the Workshop II, held in April 2015 with non-university institutions of Uruguay and farmers. Accordingly, the objectives of the Workshop III consisted on conducting an overhaul of the progress so far and set the team's expectations for the achievement of project deliverables (program and list of participants in Annex 2).

The progress of the work of graduate students is a major concern since the project proposed from the beginning to do the research through the training of human resources (see conclusions of the Workshop I in

\* All attached files are in Spanish

the first year report). Therefore, the main axis of the Workshop III was the activities with master's students (presentation of progress, exchanges with senior researchers and peers). At the same time, progress was made in the formulation of the two articles that had been previously agreed in Workshop II and in multiple virtual exchanges.

All of the master's thesis students presented their progress and participated in presentations and group discussions as well as in instances of direct exchange with the project's Pi and COPIS.

The Workshop III Took place in Punta del Este (Uruguay) in the Neike Hotel. All activities were recorded.

### 3.3 Reflections and projection of the interdisciplinary process

It is difficult to determine the limits in the performances of the groups A and B originally proposed (Figure 2), although the group B members (interdisciplinary) explicitly talked about it in more than one opportunity. However, it is possible to make some general assessments about the process of scientific integration, considering that this learning process is one of the most significant contributions of the project.

The following aspects have been identified as positive: A) Flexibility. B) Opening and support to integrate new participants and to strengthen educational/direct outreach instances. C) Dynamism and capacity of proposal (especially in the face to face instances). D) Cordial relationships and an environment of no censorship where emotions are allowed to flow, which made it possible to visualize certain conflicts as constructive.

On the other hand, the major challenges are: A) Agenda problems for the face to face meetings (and sometimes for virtual meetings too), possibly due to the conflict that exists in the use of time between academic careers of researchers and project demands. B) Geographical distances that make face to face meetings more difficult to arrange C) Epistemological distances that have emerged repeatedly in the face to face meetings. D) Conflicts that have become visible because of the group size (small compared with groups of large networks). E) Difficulties of group self-regulation. In this team the horizontal method of work was explicit from the start, however demands to assert the functional hierarchy in leadership have raised, which might reveal that networking in a more horizontal way, even in a small group, is not in the comfort zone of the academy.

Aspects related to promoting the future projection of this study have also emerged, indicating the interest and willingness of researchers to continue. Along with this projection, a self-evaluation of the project was made (how to carry it out? during which phases?), and also the search for new funding to maintain and expand the network.

According to the statement above it is necessary to continue the analysis on the original project team. Because of the fact that interest is focused in understanding the scientific integration process, it should be taken into account that it is a dynamic process and evolves according to the feedbacks. This aspect is one of the reasons why an extension of time needed is requested for this project.

## 4. Publications

### 4.1 Books and articles

\*All attached files are in Spanish

**L. Astigarraga; R. Terra; G. Cruz; V. Picasso.** 2015. Centro Interdisciplinario de Respuesta al Cambio y a la Variabilidad Climática: vínculos ciencia-política y ciencia-sociedad. Ed. Espacio Interdisciplinario. Universidad de la República. Montevideo. 122 p. ISBN: 978-9974-0-1191-5.

**Taddei, R.** 2015. O lugar do saber local (sobre ambiente e desastres). In: Siqueira, A.; Valencio, N.; Siena, M.; Malagoli, MA. (Org.). Riscos de desastres relacionados à água: aplicabilidade de bases conceituais das Ciências Humanas e Sociais para a análise de casos concretos. São Carlos: Rima Ed. Taddei, R.; Gamboggi, A. Educação, antropologia, ontologias. Educação e Pesquisa, v. 42, n. 1, 2016, pp. 27-38.

Di Giulio, G.; Groves, C.; Monteiro, M.; **Taddei, R.** 2016. Communicating through vulnerability: knowledge politics, inclusion and responsiveness in responsible research and innovation (RRI). Journal of Responsible Innovation, p. 1-37. DOI:10.1080/23299460.2016.1166036.

**Simón. C., Vienni B., Taks J., Cruz G.** 2015. Construcción Interdisciplinaria para el caso de la sequía agronómica en el Uruguay. En XI Reunión Antropológica del MERCOSUR (RAM). Mesa sobre Antropología de la Ciencia. Montevideo.

#### 4.2 Articles in preparation

Two specific articles on this project are being prepared. One of them deals with the problem of agricultural drought in science-policy interface (paper 1), in coproduction with non-academic members (listed in Annex 1). The other article discusses the interdisciplinary relationship within the group proposing the project (paper 2).

Significant advances in both articles are achieved as meetings are successfully carried out and limitations mentioned in item 3.3 are overcome and the engagement with extra academy members is achieved. Coproduction of knowledge takes time and resources if it is done well, and it is a process that is yet to be understood and characterized.

## 5. Data

### 5.1. Generating information

There are several areas of information creation and types of data generated.

At the level of meteorological information, we are creating digital files in order to estimate potential evapotranspiration in Uruguay. This has required a great amount of work because the series of meteorological data existed only on paper. The time series data that results from this project will be openly available at the end of this process, together with the data already digitalized and provided by INUMET (a working arrangement was established for this project) (see report Sofia Alvariño in Annex 3 ). Moreover, the quality of meteorological information available on the website of INIA-GRAS is analyzed, for which control methodologies performed by the Argentine Meteorological Service (see report Alessio Bocco in Annex 3) were incorporated. These same methods can be applied to data quality control by INUMET (working agreement within the framework of this project).

At the level of science-policy interface and science and society, information from interviews with actors from science, public policy and agricultural production in Uruguay is being recollected and processed as part of other projects of the PI, and this information will be incorporated to the theses of Rossanna González and

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Hugo Partucci (see reports in Appendix 3). After concluding this phase, the networks approach will be performed as is considering in the proposal.

At the level of academic interdisciplinary work, collective work in workshops and other instances of exchange is being registered and analyzed by the team "B" (Figure 2) (see report Claudia Simon in Annex 3), having completed the systematization and analysis of the first stage. The meetings of the students, which started in March 2016, are also being recorded and processed (see reports of all students in Annex 3 and audiovisual material produced by Hugo Partucci attached to this report).

## 5.2 Availability of information created and / or shared

All information is shared within the team immediately, according to the agreed requirements. It is partially shared on the site <http://www.agrodrought.ei.udelar.edu.uy/>. The site is being updated but there is need to review it, and an agreement with all participants must make about the information shared before making widely available on the web.

## 6. Capacity Building

### 6.1 Master's thesis

#### 6.1.1 On the biophysical causes of agricultural drought: Thesis Sofia Alvariño and Alessio Bocco

The increased precipitation in the region is something proven, but not yet the temporal trends in atmospheric demand (potential evapotranspiration). These two are the atmospheric variables involved in drought frequency, duration and intensity. Because of this it is necessary to estimate the trend of potential evapotranspiration in time and space, as well as to validate simple indicators that allow monitoring. These theses are in laboratory stage, advances in information are available in Annex 3 of this report.

#### 6.1.2 On the perceptions of agronomic drought and science-policy interface: Thesis Hugo Partucci and Rossanna González

The social sciences have shown that human decisions are made according to the perception of the social actors and not according to "objective" reality. People process information the world around them subjectively, so it is necessary to distinguish between reality and perception in decision-making processes that affect the people's lives. According to the scale at which decisions are made they have different impacts. Decision makers at the political level affect a large number of people directly, and farmers make daily decisions at the level of agricultural establishment that directly affect natural resources. Understanding how these mechanisms work and the role of science in this interaction are the main objectives of these theses. These theses are in the stage of field survey, more information can be found in Annex 3 to this report.

#### 6.1.3 About the interdisciplinary process: Final work of Claudia Simon

As part of this project, Claudia Simon has completed her Diploma of Specialization in Interdisciplinary Research, in the Center for Interdisciplinary Research in Sciences and Humanities at the National Autonomous University of Mexico, UNAM (see report in Annex 3) and has prepared a paper which was presented Anthropological the XI Meeting of MERCOSUR (item 4.1 of this report). In addition to the information in item 5.1, monthly online surveys for student's graduate project are being implemented with

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the goal of recollecting information for another paper and in order to have more productive face to face meetings this year.

## 6.2 Justification of the deadline extension CRN3106

As indicated previously, the work of graduate students is considered central because the project proposed from its begging to conduct investigations through these theses work. In addition to the academic and operational complexity of the project that can be appreciated in this report, there were bureaucratic delays at the level of the central administration of UDELAR to create and effectuate the payment of the grants. Currently the work is carried out with relative normality and continuity. It is noteworthy that the students who viewed delayed the payment of their scholarships also carried out the tasks.

## 7. Regional Collaboration / Networking

Collaboration and network conformation also occurs on several levels. We have attempted to delimit the project network along with its integration progress (Figure 1 and Appendix 1). This is difficult because the edges are diffuse; the criteria to be considered are too many to accurately define who part of that network is and who is not.

In an academic context data, methodologies and fieldwork are shared. Examples of this are the shared tutoring of the theses between universities that make up this project, synergy with tasks that had tutoring assigned (thesis Hugo Partucci), which is the result of the link with the IAI-CRN3035, and the incorporation of new tutors (thesis Rossanna González). Other COPIS also collaborated with the development of the theses, an aspect that is highlighted by some researchers and not presented in this report (thesis Bocco Alessio and Sofia Alvarino). Instances such as those organized by IAI in December 2015 contribute to the expansion of academic networks, but usually the time to bond is short and the number of topics / approaches / actors is huge.

With regard to networking with stakeholders it seems that it is less difficult than expected, at least with the institutions and people who have been contacted and integrated. It is very positive to be able to reach out for them, not only of the workshops, but also for writing in paper 1 in collaboration. This feature could prove to be validated in the remaining period of the project, and we could identify if this applies only to this case.

## 8. Media Coverage and Prizes

Uruguayan press article on the agronomic drought in Uruguay in 2015: Calvello, N; Pagola, F. 2015. With his feet on the ground. In daily special supplement "Future Day", p. 1-3. 26 June 2015. <http://ladiaria.com.uy/suplementos/>. Interviewed from the project G. Cruz and A. Gimenez.

## 9. Policy Relevance

The direct linkage with Uruguayan government institutions from the start (CoPIs from Agricultural Plan Institute and System for Response to Climate Change and Variability) and the further involvement from the National Agricultural Research Institute, the Uruguayan Institute of Meteorology and the Ministry of Agriculture (see list of involved stakeholders in Annex 1) are providing information about how is faced the problem of agricultural droughts at political level and the links between these institutions, inside them, with academy and others stakeholders. Part of this information is being systematized, analyzed and also written by them as part of the whole work for incorporates to project outcomes (outcome referenced as paper 1 in

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item 4.1). At the same time, information from rural organizations and livestock farmers is being collected and analyzed for linking the necessity of appropriate agrometeorological information (among others types of information needed) for feed backing the process and legitimize the academic work. All of that is highly significant considering that two of the fourth project objectives are to identify the supply and demand for climate knowledge to support decision-making for adaptation to agricultural droughts, and to strengthen the channels of communication between climate scientists and public policy makers.

## **10. Main Conclusions**

The second year of work focused on the transversal approach of the "perceived" agricultural drought, "experienced" and/or "studied" at different scales (producers, academia and politics) as agreed in the Workshops held (I, II and III); as well as on research how to better carry out this process (meta-study interdisciplinary).

The initial metaphor of the "onion diagram" as a model that enables involvement and understanding of this complex problem (which from the start was raised as such), has proved to be useful when it comes to promoting integration and to divide the work into operating units, especially at the level of graduate theses.

As for the interdisciplinary meta-study, there is some concern about the possible loss of objectivity by the fact that we are study ourselves. This aspect produces tension due to the different disciplinary perspectives on the creation of scientific knowledge. Will Intersubjective agreements be reached at the time of the project? Or at least, what would be the best conditions to encourage them? The path laid out for the third year is trying to start answering these questions (Table 3).