

## 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

**Principal Investigator:** Gabriela Cruz Brasesco Espacio Interdisciplinario y Facultad de Agronomía. Universidad de la República (UdelaR) – Uruguay [gcruz@fagro.edu.uy](mailto:gcruz@fagro.edu.uy)

**Reported period:** May 1<sup>th</sup> 2014 to May 1<sup>th</sup> 2015 – Year 1

### 2. Project Funding

The total funds from IAI for the project over the three years (2014-2016) are: USD 162000. During the first year funds committed by IAI were: USD 48500. Only USD 38500 was received from IAI for this first year.

Funds were received from the Centro Interdisciplinario de Respuesta al Cambio y la Variabilidad Climática (Espacio Interdisciplinario, UdelaR) for covering the cost of web page building (USD 2000).

### 3. Research Activities and Findings

**3.1** Collective research activities of the CRN3106 during this period were Workshops I and II.

#### Workshop I June 9<sup>th</sup> to June 11<sup>th</sup> 2014

The Workshop I took place in Montevideo in the Interdisciplinary Center (Espacio Interdisciplinario) of UDELAR.

Attached\* is the workshop's program. The purpose consisted in generating agreements and mechanisms on the team work process and how to achieve the following project objectives in two and half years: 1) to identify the supply and demand for climate knowledge to support decision-making for adaptation to drought in livestock grazing systems; 2) to strengthen the channels of communication between climate scientists and public policy makers (SNRCC); and 3) to record and analyze the interdisciplinary process in order to delineate specific methodological guidelines for future interdisciplinary work. Objectives 1 and 2 are pursued by "Group A", while objective 3 is pursued by "Group B".

The Uruguayan Director of Environment (from the Ministry of Environment, MVOTMA) Jorge Rucks, the PI of CRN3035 Cecilia Hidalgo, the Scientific Director of IAI Elma Montaña, and the PI of this project Gabriela Cruz, addressed the audience at the opening ceremony of the workshop. The list of Workshop I participants is also attached\*.

All activities were recorded. Discussions were mainly about project objectives 1 and 2. Some photographs and documents of the meeting are attached\*. At this stage baseline interviews were made and a first report was elaborated by Group B, which was distributed to all Co-Pi for consideration and discussion. This report,

\*All attached files are in Spanish

related to the analysis of the interdisciplinary process to delineate methodological guidelines for the interdisciplinary work, is also attached\*.

#### Workshop II April 15<sup>th</sup> to April 18<sup>th</sup> 2015

The Workshop II took place in Punta del Este (Uruguay) in the Neike Hotel (see item 6).

The objectives of Workshop II consisted in: knowing how the problem of agricultural drought is faced by different institutions directly linked to the problem in Uruguay, identify and develop a guideline for delimit and explicitly link the different problem areas, and continue monitoring the interdisciplinary process. Program and list of participants of Workshop II is attached\*.

Key informants from the institutions most closely linked to the problem of agricultural drought were invited to project meetings: Office of Policy and Planning from the Ministry of Livestock, Agriculture and Fisheries (OPYPA, MGAP); National Agricultural Information System (SNIA, MGAP); Uruguayan Institute of Agricultural Research (INIA); and Uruguayan Institute of Meteorology (INUMET). Other institutions also closely involved with drought issues were formally involved in the project from the start, such as the Agricultural Extension Institute (IPA) and System for Response to Climate Change and Variability (SNRCC). All informants attended Workshop II and made presentations showing their institutional mandates and specific actions undertaken within the framework of agronomic drought. These presentations helped to provide answers to the following questions: What information related to agronomic drought is produced/used in each institution? Who applies/uses this information? Why do you think that the information produced/used is relevant? How do you check that the information was used? After each presentation there was a space of collective and deeper exchange about specific aspects according to the characteristics of each institution. The presentations are available on the project website <http://www.agrodrought.ei.udelar.edu.uy>

In addition and also during Workshop II, there was an instance of dialogue with livestock farmers. Three livestock farmers attended, with the following characteristics: one woman and two men; ages between 35 and 65, two farmers who perform only grasslands livestock production and one farmer with diversification of production; two come from hilly land (poor soils) and one comes from plain lands; one person lives on the farm, while the other two live in the city. In addition, one of the farmers is a representative of the farmers' local association, another farmer is head of the Bureau of Rural Development of Maldonado (MGAP); and the other farmer is retired from the professional activity and currently its farm is leased to others.

From this meeting, answers emerged to the following questions: Have you ever experienced an agricultural drought since you started farming? How was it and what impact did it have? Do you seek weather and climate information as input to your farming decisions? What information channels do you use to keep informed? Do you find this information useful in planning activities on your farm? Is there information (of any kind) that you needed and was not available (or did not exist)? How do you think we can improve the impacts of and response to agronomic drought (or from whom is assistance or collaboration expected)?

From the above, several nodes emerged as part of an information/action network. The nodes include not only public institutions that formulate public policy (e.g., drought response) but also end users who interact, on some level, with the public institutions. The network graph cannot be represented yet, as we need to identify intermediate nodes on both levels. At the same time, the academic nodes have yet to be explored in detail. Three of the proposed thesis will provide elements for the representation of the network, and the

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remaining workshops will enable collective in depth discussion as well as a systemic view of the entire network.

Each of the thesis develops a different and complementary part of the project. At the same time, three of the master's thesis students attended the Workshop. They actively participated in presentations and group discussions as well as in instances of direct exchange with the project's Pi and CoPis.

At this stage, monitoring questionnaires were elaborated and implemented by Group B. Also, was proposed the elaboration of a scientific paper on interdisciplinary, co-produced between Group A and Group B, with the agreement of the rest of the CoPis.

### 3.2 Distribution of researchers in the two lines of work

Group A (focused in the science-policy interface): Hermes Morales, Martha Vinocur, Renzo Taddei, Ignacio Lorenzo, Guillermo Podestá, Valentín Picasso, and Gabriela Cruz.

Group B (focused in the interdisciplinary work): Bianca Vienni, Javier Taks and Cecilia Hidalgo.

### 3.3 Specific responsibilities of the co-PIs

Hermes Morales: Responsible for linking the needs of climate knowledge of livestock farmers, through the Agricultural Extension Institute from Uruguay ([www.planagropecuario.org.uy](http://www.planagropecuario.org.uy)).

Martha Vinocur: Responsible for providing expertise from research on Agrometeorology and adaptation from livestock systems to drought from the Faculty of Agronomy of UNRC, Argentina (<http://www.ayv.unrc.edu.ar/>).

Renzo Taddei: Responsible for providing expertise from anthropology research (Actor Network Theory) from UFSP (Brazil), and analyzing the interactions between science - policy - livestock farmers (<http://www.imar.unifesp.br/>).

Ignacio Lorenzo: Responsible for linking the needs of climate knowledge of government institutions, through the National Climate Change Response System (SNRCC) Uruguay (<http://www.mvotma.gub.uy/>).

Guillermo Podestá: Responsible for helping to provide a systemic, integrative perspective to the project. Podestá, (Univ.of Miami <https://www.rsmas.miami.edu/>) will also participate in synthesis and publication of project findings. Moreover, he will provide liaison between this project and the operational activities of the Regional Climate Center for southern South America (of which Uruguay is a member), that is currently designing a drought monitoring, prediction and preparation system. With C. Hidalgo, he will also provide linkages to CRN3025.

Valentín Picasso: Responsible for providing expertise from research on grasslands science and beef grazing livestock systems, from the Faculty of Agronomy, as well as adaptation from livestock systems to drought as researcher in the Interdisciplinary Center in Climate Change from UdelaR, Uruguay (<http://www.fagro.edu.uy> and <http://www.circvc.ei.udelar.edu.uy/>).

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Bianca Vienni: Responsible for providing expertise from interdisciplinary research and analyzing the interdisciplinary process to delineate methodological guidelines, from the Interdisciplinary Space from UdelaR, Uruguay. Responsible with Javier Taks, for planning and implementing the methodology used to produce an interdisciplinary baseline for the project (<http://www.ei.udelar.edu.uy/>).

Javier Taks: Responsible with Bianca Vienni, for planning and implementing the methodology used to produce an interdisciplinary baseline for the project. Providing expertise in the theoretical discussion that has integrally realized the project with seminars and courses, from the Faculty of Humanities and Education Sciences from UdelaR, Uruguay (<http://www.fhuce.edu.uy/>)

Cecilia Hidalgo: Collaborator from CRN3025, providing expertise from interdisciplinary research (<http://antropologia.filo.uba.ar/>).

Gabriela Cruz: Responsible for providing expertise from research on vulnerability of agro-ecosystems to climate variability, from the Faculty of Agronomy, Uruguay. Responsible of the social network analyses as researcher in the Interdisciplinary Center in Climate Change from UdelaR. Responsible for the scientific and technical direction of the project. Responsible of executing project funds, according to academic and scheduling needs, in the frame of the approved budget (<http://www.circvc.ei.udelar.edu.uy/> and <http://www.fagro.edu.uy/>).

#### **4. Publications**

A manuscript about the interdisciplinary process is being written. There are no publications from this project yet.

#### **5. Data**

The website of this project is available. Access to website (agrodrought) is at the following link <http://www.agrodrought.ei.udelar.edu.uy/>.

#### **6. Capacity Building**

**6.1** Seminar “El arte de visualizar el cambio climático”. Dr. Cristian Simonetti, University of Aberdeen. Scotland.

This seminar was developed at the suggestion of Javier Taks, project CoPi. It took place in the *Espacio Interdisciplinario* (UdelaR, Montevideo) in September 4<sup>th</sup>. Outside Montevideo members could attend the seminar by videoconference.

The aim of the seminar, conceived as a means for capacity building within the research team was twofold. On the one hand, to provide a rich approach from the anthropology of science to the different conceptions of time among climate scientists and decision makers (long and short time span), despite what it seems a common background in Western Thought and Experience of time (climate history as a process of vertical

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deepness). On the other hand, to present among Co-PIs some concepts and metaphors commonly used in Humanities and Social Sciences in their treatment of science as a way of knowledge (ie. situated practice; interdisciplinary work as a bundle of life-lines rather than a network of “isolated brains”), but rarely known by agriculture, climate and natural scientists. This sharing of a basic lexicon and epistemological orientations was understood by the PI and CoPIs as a fundamental phase of any interdisciplinary work. It was a theoretical contribution from Group B to Group A. The project has already made use of insights derived from this Seminar to the point that some members of Group A have expressed that “now I start to understand at least a bit what an anthropologist does”, which is not little thing in a research team where three Co-PIs have that educational background, two of them deeply involved in the work of Group B.

Attached\* is a summary of the Seminar.

## 6.2 Course “Actor Network Theory”, directed to graduate students. The objectives of this course were:

To discuss with the participants the relationship between "hard" sciences, applied sciences and social sciences; report on the contributions of the social studies of science and technology; present the contributions of the actor-network theory; and discuss the implications of what these theories propose for studies of climate change and climate variability.

The course accredited for the Postgraduate Program of the Faculty of Agronomy (UdelaR). It was dictated by Renzo Taddei (CoPi) in coordination with Gabriela Cruz (Pi) in the *Espacio Interdisciplinario* (UdelaR, Montevideo) from December 15<sup>th</sup> to December 20<sup>th</sup>, 2014.

The program and the list of students are attached\*.

## 6.3 Master’s thesis

Five students began developing their final work in the framework of their respective postgraduate programs. Currently they are in the drafting stage of their thesis projects. Students are identified in the following table with name, university postgraduate program, tutors, and thesis topic.

Table 1. Master's thesis work by student name, tutors and topics

Name	Postgraduate University Program	Tutors	Topic
Rossanna González	UdelaR	Tutor from UdelaR and Renzo Taddei (UFSP)(co tutor).	Agricultural droughts: decisions at the political level, interaction between science and policy (Political Sciences approach).
Hugo Partucci	UBA	Renzo Taddei (UFSP) and co tutor from UBA.	Agricultural droughts: decisions at livestock farmer’s level and interaction between farmers Organizations, Policy and Science (Anthropological approach).
Sofía Alvariño	UdelaR	Gabriela Cruz and Rafael Terra	Temporal and spatial evolution of evapotranspiration and agricultural

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		(UdelaR)	drought in Uruguay (Biophysical approach).
Claudia Simón	UdelaR	Bianca Vienni (UdelaR) and Cecilia Hidalgo (UBA)	Dialogue of knowledge: rural community and scientific community (Interdisciplinary Approach).
Natalia Acastello	UNRC	Martha Vinocur and and co tutor from UdelaR	Performance of SPI and SPEI to monitor droughts in Uruguay and Argentina.

## 7 Regional Collaboration/Networking

Cooperation with CRN3035 project was established through the participation of Dr. Cecilia Hidalgo in Workshops I and II. One of the master thesis will be co-oriented by Prof. Hidalgo.

## 8 Media Coverage and Prizes

No media coverage at this stage.

## 9 Policy Relevance

Personnel from the Uruguayan Ministry of Environment (MVOTMA), the Agricultural Plan Institute (IPA), and from the System for Response to Climate Change and Variability (SNRCC) were involved from the start. Personnel from government agencies like the National Agricultural Research Institute (INIA), Uruguayan Institute of Meteorology (INUMET) and Ministry of Agriculture (MGAP) are also involved (see lists of Workshops participants attached\*).

We are in the process of translation and systematization of the Workshop II's records (audio and video recordings, presentations, etc.). However, some aspects of political and academic relevance discussed during the Workshop II are summarized below.

*The processing of relevant information to make decisions in terms of public policy in the case of Uruguayan agricultural drought, it would not be aligned with the information needs of farmers. The largest spatial and temporal scales at meteorological and agronomic information is processed from government agencies (SNIA, INIA, INUMET), it is not used to make decisions at the farm level or is not shown as relevant from farmers to help them for taking decisions in the short and medium term in situations of agricultural drought. The seasonal climate forecasts expressed in relation to normal rainfall are the clearest expression of lack of relevance from the perspective of livestock farmers. This is a preliminary conclusion must be confirmed, although there are precedents for Argentina (Río Cuarto) and Jamaica showing the same shift.*

*This does not necessarily mean that the decisions at the level of public policy are incorrectly informed. The governors have to plan at larger territorial scales than those of the farm, but it is necessary to accept that such information of larger scale enables only certain types of decisions that are useful to the level in which they were developed (but no further).*

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*Currently in Uruguay, the official declaration of agricultural drought by the Government (MGAP) is made when there is objective evidence of this from the sphere of counseling (INUMET, INIA) and there are complaints (in written) about the lack of water from a rural union of high representativeness, both at the same time.*

*For their part, farmers who raise grazing livestock, in a situation of water deficits await the official declaration of drought from the Government, moment at which actions are implemented to help farmers to alleviate forage crisis, especially providing feed supplementation (because of lack of feed for the cattle).*

The situation explained before, has resulted in more questions than answers from the team's project:

Why is it assumed that the information provided from government at large territorial scale can be useful to the livestock farmers in order to planning and making decisions at the farm scale?

How does the government agencies (which produce and disseminate information) understand that information is used by farmers? Do they assume that there are intermediate translators of information like the technical advisers or extensionists?

Why and what for are there so many definitions and perceptions of the phenomenon "agricultural drought"?

Does agricultural drought refers to the prolonged lack of water in soil which substantially affects the growth of pasture? Does it refer to the forage crisis affecting the maintenance of livestock because of the lack of water (among other things)? Does it refer to the spring-summer grassland crisis in large Uruguayan regions, which by its magnitude involves high potential of economic losses? Is it a widespread phenomenon or is considered a timely phenomenon?

Depending on the interlocutor there will be different visions of what apparently is the same phenomenon.

This whole issue, raised earlier in a very summary way, is the basis that orients the research project for the next period.

## **10 Main Conclusions**

The interaction between the two groups (A and B) is as expected, with some confusion between roles at the start of the project but moving towards a clearer image of its aims, as far as confidence grew up between researchers. As the group A progress on in its empirical study cases in the policy/science interface, there will be more insights in a different level of interdisciplinary work, the one focused in resolving the demands and linkages arising for the encounter of decision makers and scientists.

The group reaffirmed the approach of the project as it was originally proposed, identifying four themes:

- 1 Actors (scale and connections, demographic characterization).
- 2 Policy issues (even if they are not written) and regulatory frameworks.
- 3 Political, technical, and social structures (agencies, ministries, extension, press) to make connections, calendars, etc.

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4 Economic processes (market and prices).

**The biophysical aspect should be across the board for these 4 axes mentioned.** Climate and drought would be taken as a whole; the effect is different depending on the context.

The group agreed with working on "study cases" that can then be generalized. The work of the master thesis will incorporate these study cases. Two of the master's thesis will complete the description of the agricultural drought at the biophysical level. Other thesis will capture the transfer of climate knowledge at the national government scale, while another work will "follow the conflict generated by the drought" starting from the farmer scale. Finally a thesis will study the process of co-construction of the project (interdisciplinary).

The background and discussions made at the second workshop strengthened the strategy of the project, maintaining that project research is around the thesis of graduate students. This, along with the virtual meetings and the Workshop III (planned for October 2015), facilitates the integration of information, develop of analysis, and the monitoring of student work.