

Comparative analysis of quantitative water management instruments for agriculture in the face of climate change : France (Occitanie) - Spain (Andalously)

Master Thesis offer – Spring 2021 (6 month)

N. Graveline – Projet TYPOCLIM

The TYPOCLIM project (<https://typoclim.cirad.fr/>) financed by MUSE (Montpellier Université d'Excellence) is coordinated by Marie Hrabanski (Umr Artdev/CIRAD) and investigates policy instruments for the adaptation of agriculture to climate change in 8 countries from North and South (France (Occitanie & Guadeloupe), Spain, Senegal, South Africa, Brazil, Colombia, USA-California). Its main objectives is to screen the diversity of the instruments in each case studies and to assess them in terms of policy -making, economic and environmental issues.

This master internship aims at carrying out a comparative analysis of the instruments of quantitative water management policies (or access to irrigation) in France (Occitanie) and Spain (Andalusia) (possibly California) in the perspective of adaptation to climate change to build on these experiences for future policy development. These quantitative water management instruments have often been developed to organize the relative scarcity of water available for agriculture in the face of decreasing water resource availability and/or because of user conflicts, not specifically in reaction to the effects of climate change. We will consider instruments that aim at the regulation of both (i) the access to the resource, (ii) the quantity (timing) of the water used. The specificities brought by climate change are increasing temperature, shifting rain patterns, increasing extreme events and increasing uncertainties. They should be considered together with other global changes that affect farming.

This master thesis will explore if and how these instruments have been, are or could be adapted to climate change, combined or strengthened to cope effectively with the effects of climatic change. The following specific questions will be investigated:

- What are the different theoretical features of the instruments with respect to their capacity to cope with the effects of climate change (e.g. variability or strengthening of constraints) ?<sup>1</sup>
- What are the adaptations made to these instruments or to the operational implementation of the instruments to adapt them to climatic change or other global changes? What is the discourse around climatic change relative to these instruments (initially and over time)? Are they combined with other instruments (idea of counterparts: e.g. restriction on water use against a subsidy on adaptation)?
- How can they be assessed to be compared with other adaptation options? What are their ex-post assessment, adaptation options, critics and why?

The program of work will be organized around the following main steps:

- (i) a preliminary step including a literature review on the instruments of quantitative water management and the description of the institutional landscape of these instruments,
- (ii) the methodological development of an approach for the ex-post assessment of the multi-criteria performance of quantitative water management instruments that should help compare the performance of these instruments with other adaptations to climate change of agriculture,

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<sup>1</sup> E.g. Graveline, N. (2020). Combining flexible regulatory and economic instruments for agriculture water demand control under climate change in Beauce. *Water Resources and Economics*, 29, 100143.

- (iii) interviews to water basin authorities, farmers and other representatives of the food production chain, researchers (modellers) to assess how the instruments perform and are perceived,
- (iv) recommendations for adapting quantitative water management instruments and policies to climate change at EU, national, basin level

The master will be supervised by Nina Graveline (Innovation Joint Research Unit), economist assisted by other researchers (economics, political scientists) in this topic (Dioni Perez Blanco (University of Salamanca), Alvar Escriba Bou (Public Policy Institute of California), Dolores Rey (Cranfield University), Elena Lopez Gunn (Icatalist/ University of Leeds) and of the project (Jean-Marc Touzard (INRAE), Marie Hrabanski (CIRAD), Pierre-Louis Mayaux (CIRAD)). The group of experts will meet if possible every month to follow and guide the candidate on the choices and analysis made. The objective is to valorise the work with a scientific publication. A significant room for personal initiative is left to the candidate. The option to continue with a PhD contract on related topics might be offered at the end of the internship.

**Profil :**

Master 2 : Master in agricultural and/or resource and/or environmental economics or water policy sciences // Ecole d'ingénieur (agro)

**Conditions**

Office : UMR Innovation, bâtiment 27 du Campus La Gaillarde, Montpellier.

6 month, start march/april 2021.

Salary « grille INRA » (~600 €/month). Access to the restaurant of Supagro

**How to candidate ?**

Send a CV & lettre (french or english) to : [nina.graveline@inrae.fr](mailto:nina.graveline@inrae.fr) . Please specify « Stage TYPOCLIM Instruments » before decembre 31.