



## JOB POSITION

### Post-doctoral position in economics

### “Performance of water supply services and multi-objective asset management: contribution of the cost-benefit analysis”

*The French National Research Institute for Agriculture, Food and the Environment (INRAE) is a public institution with more than 11,000 agents across the French territory. Inra is the first European agricultural research institute and produces scientific knowledge and works for economic and social innovation in the areas of food, agriculture and environment. It focuses on issues related to agriculture, food and environment, with a particular emphasis on sustainable development and agroecology.*

## WORKING ENVIRONMENT AND ACTIVITIES

Under the project “Gestion patrimoniale des réseaux d’eau potable pour préserver la qualité de l’eau et réduire les pertes - Renouvellement Orienté des Canalisations (ROC)” funded by the Région Nouvelle Aquitaine, the Agence de l’eau Loire-Bretagne and the Agence de l’eau Adour-Garonne, INRAE offers a 15-month postdoctoral position in economics from September 1, 2020.

Drinking water networks are a high value asset with a long service life; their management must thus adopt a long-term approach and adapting to changes in their environment, mainly connected to global change and new technologies. The key challenge of this “asset management” is the annual renewal of a small portion of pipelines, in order to mitigate the effects of ageing on their performances, and to prevent the deterioration of the quality of service. It thus concerns technical, organisational (service), economic and financial (costs and benefits), environmental (resources) and societal (territorial governance, users) issues, which call for interdisciplinary answers enlisting engineering, mathematics and social sciences.

In this context, the ROC project aims to develop tools and methods allowing potable water distribution system authorities to build asset management strategies oriented towards limiting water loss and safeguarding water quality. The study sites are located in the Région Nouvelle-Aquitaine.

Today, health risks (in particular linked to the presence of Vinyl Chloride Monomer (VCM) in PVC pipes) and the limitation of water loss are usually driving the decision regarding water pipes renewal. However, the methodological reflection remains focused on risks of service interruptions and impacts of malfunctions on the urban environment. And it is mainly based on multi-criteria decision-making. A major challenge for research thus lies in taking into account the other dimensions of the performance of water supply service, namely integrity of the network (resource protection) and water quality (among which the issue of CVM). This is especially true since, in most cases, actions undertaken to satisfy one axis of performance are sub-optimal for the others. It appears that technical sciences are able to generate new knowledge on each axis taken separately. However, their integration, which is an operational necessity, requires a more complete picture on the issue and the resort of economics. To achieve this goal, we propose to use a Cost-Benefit Analysis (CBA), which seems to allow taking into account the multi-objectives character of asset management.

The postdoctoral student will lead the CBA in order to compare three asset management strategies leading to the same amount of work but each focussing on one specific dimension of service performance (water quality; service continuity and protection of the urban environment, that is to say prevention against breakages; limitation of water loss), while considering the water price. More precisely, the postdoctoral student will have to:

- Convey the state of the art and best practices in the economic analysis of the performance of drinking water supply services;

- Contribute to building the research question, in link with the scientific objectives of the project;
- Define the data collection protocol, taking into account the existing literature and recent methodological developments in the area;
- Conduct the CBA and analyse the results;
- Contribute to the dissemination of those results.

## TRAINING AND SKILLS REQUIRED

- Ph.D. in economics
- Mastery of the quantitative techniques (statistics and econometrics) and of dedicated software
- Experience in fields surveys
- Familiarity with monetary valuation methods
- Interest in the issues of water management
- Autonomy
- Oral and drafting skills in French and English
- Aptitude for team work and interdisciplinarity

### ↘ Reception conditions

- Research unit and location: UR ETBX in Cestas, France

Travels are expected in France and abroad (associated expenses will be covered)

- Type of contract: fixed-term post-doctoral contract
- Duration: 15 months
- Starting date: expected September 1, 2020
- Salary: minimum wage rate of an INRAE “Ingénieur de recherches”. The final salary is linked to the previous experience according to the EPST salary scheme

### ↘ How to apply

Your pre-selection application should include a CV and an up-to-two-page cover letter describing your interest in the subject and a post-doctoral research project on the basis of the information provided above.

An initial selection from the applications received will be made; a hearing will then be organised.

- Applications should be submitted by email to: [benedicte.rulleau@inrae.fr](mailto:benedicte.rulleau@inrae.fr)

✘ Deadline for applications: 28 June 2020