



PhD position

Mines Saint-Etienne
The « Environnement Ville et Société » lab (CNRS UMR 5600)
Institut Henri FAYOL – Environmental engineering department

**Assessing the influence of low-tech on regional resilience:
The case of the food system**

Background

The depletion of natural resources and climate change are major environmental challenges that question our current modes of production and consumption. Faced with these long-term disruptions, public authorities and organizations must be able to measure and increase their degree of resilience by promoting adapted development strategies. In this context, "low-tech" or "low technology" is a way of moving away from the purely technological innovation model. Indeed, the low-tech approach is based on a (re)connection of production systems with the natural and social environments in which the technical systems are designed and evolve, by putting forward technical objects and systems using less materials and energy, that are appropriable at the individual and collective levels, convivial and robust. As such, low-tech systems are potential vectors of territorial resilience.

The objective of this PhD is to develop a systemic analysis framework to characterize the potential influence of low tech on regional resilience. To this end, the approach will need:

- to identify the indicators of regional resilience that are particularly relevant in a context of increased resource constraints and the categorization of the different socio-technical factors that influence their evolution
- to model and parameterize low-tech deployment scenarios in a regional context and their consequences on resource usage (Material Flow Analysis (MFA) method, consequential approach)
- to combine the two previous points to characterize these scenarios by the resilience indicators thanks to the adaptation of tools used in risk analysis (MADS-MOSAR for example) and to compare them to business-as-usual scenarios.

The chosen field of application is the food system, with examples on the whole chain, from cultivation (e.g. permaculture) to cooking (e.g. solar ovens). Collaborations with actors working in low-tech or applying low-tech approaches in the food sector are planned.

Results of this PHD (method and models) will be integrated into the Territory platform developed within the Institut Henri Fayol (<https://territoire.emse.fr/>)

Eligibility

Good primary degree (or MSc) in a related discipline (Environmental science or engineering). The candidate should have strong knowledge and practice in one (or more) of the following areas: systemic analysis, urban metabolism (qualitative and quantitative approaches), conducting interviews, performing multicriteria analysis, scenario modelling.

Basic knowledge of systems dynamics, resilience indicators, low-tech approaches and food systems will be a plus.

We look for excellent analytical, redaction and communication skills. The candidate should work well in a team and be autonomous.

The candidate should have a B1 or B2 level in French and English (at least). A lot of communication with the partners will be in French (it is also possible to take French classes at Mines Saint-Etienne).

Additional information

PhD advisor : Valérie Laforest

PhD co-supervisors : Eric PIATYSZEK et Audrey TANGUY

The PhD will take place at Mines Saint-Etienne, Institut Henri Fayol, Environmental engineering department (département GEO). ED SIS 488 (<https://www.mines-stetienne.fr/>)

The department is affiliated to a larger research laboratory: UMR 5600 Environnement Ville Société (<https://umr5600.cnrs.fr/en/homepage/>)

An international mobility (3-6 months) is mandatory over the course of the PhD.

The PhD scholarship is 2310€/month (gross salary) and 1856€/month after tax deductions.

How to apply

The application should include :

- CV + cover letter
- Academic grades of the last two years
- One or two recommendation letters
- Contact info of the MSc tutor (if applied)

To be sent to Eric Piatyszek (piatyszek@emse.fr) with the title: « Application for Resilience PhD 2022 » **no later than April, 21st 2022.** Interviews with potential candidates will be held in May.

For more information, you can get in touch with laforest@emse.fr, piatyszek@emse.fr and/or audrey.tanguy@emse.fr