TISANBIOM

Testing and Influencing Stakeholders' Acceptance of new techno-economic models for a sustainable harvest of forest BIOMass

Principle investigator: Jens Abildtrup, UMR Bureau d'Economie Théorique et Appliquée (BETA)

LabEx partners: Laurent SAINT-ANDRE (BEF) Anne Stenger (BETA)

With the collaboration of: FCBA, ONF, IRSTEA, GCF, committee of professionals

Work packages: *WP4*

Context —
Recently, the projects (Gerboise and Insensé) have updated the existing environmental recommendations from 2006 on harvesting practices related to forest biomass for energy (ADEME, 2006). Discussions with professionals involved in the mobilisation of forest biomass show that some recommendations are not applied; indeed, some actors are not convinced that harvesting whole trees can cause problems for soils or biodiversity. However, to be sustainable, the increasing use of forest biomass requires an evolution of harvesting practices, based on adherence to the recommendations. The project therefore aims to enhance the implementation, by the actors involved in biomass harvest, of the recommendations for the long-term preservation of forest soils and their fertility. This project is complementary to the Tamobiom project (Ademe, APP Graine) which has four tasks. Tisambiom contributes to third task: "Identification of the obstacles/levers related to the implementation of harvesting recommendations".
A behavioral economics approach will aim to better understand the type of incentives, their forms, and the institutions, which are the most efficient in influencing professionals to change towards a sustainable harvest of biomass.

Objectives —
The aim is to encourage professionals in the wood sector to adopt these new sustainable biomass harvesting practices. We will proceed in two stages:

- Determining the most effective incentives.
- Testing, using a laboratory experiment with students, different types of non-monetary incentives.
- Testing these incentives with professionals in the forest/wood industry.

Approaches —

- We organized workshops with forest actors to learn about the obstacles to behavioural change: economic, psychological, and technical (2019).
- We explored the experimental and behavioural economics literature to develop an experimental protocol, taking into account the forest context, and to find non-monetary incentive mechanisms that could have an impact on the behaviour of forest actors.

- Potential non-monetary incentives that can have an impact on forest operators' decision emerged from the reunions we had with forest stakeholders. Finally, we decided to first focus on the following two incentives :
    a. Signing a declaration where committing to harvest sustainably.
    b. Priming subjects to act in a sustainable manner. Primed subjects were asked to complete each of 24 sentences by the adequate word from a list of 3 words. Two different priming treatment conditions were defined, a neutral priming task and a sustainability priming task. In the sustainability task, 16 out of 24 sentences were related to sustainability,
- We have carried out experiment with 384 students in the experimental economics laboratory at BETA in Strasbourg (pilot June, 2020, main experiment October 2020 and February 2021). Based on these results it is planned to replicate these experiments "in the field" with forest professionals in two pilot regions. However, due to the covid19 restrictions these experiments have been abandoned. We tried to organise an experiment with students *Campus de Mirecourt, Agricole et Forestier*, as this would allow to test if students specialized in the forest sector behave different than students, in general, recruited at University of Strasbourg. Again, due to Covid restrictions it was not possible to implement this experiment. Finally, we carried out an additional experiment in the lab in Strasbourg to the robustness of the positive effect of signing a declaration in a different context where wood buyers are not competing about buying biomass from forest owners.

Key results —

Signing a declaration about commitment to harvest sustainable increases the likelihood that a subject chooses to harvest sustainably, even then this implies personally financial costs.

- Sustainability priming does not have a statistically significant effect on the harvest behaviour.
- Importance of peer effect on pro-environmental decisions, i.e. observing other subjects harvesting in a non-sustainable manner reduce the likelihood of harvesting according to the guidelines for sustainable harvest. This result is consistent with what we observe in public good game where subjects' contribution to the public good is conditional on those of others.
- Environmentally sensitive subjects were more likely to harvest sustainably.
- In the context where there no competition between players, the effect of signing a declaration about commitment to harvest sustainable does not increase the likelihood significantly. However all players are more likely to harvest sustainably when no competition.

Main conclusions including key points of discussion —

- Based on the first experiments with students we conclude that non-monetary incentives may have an impact on harvest behaviour. In particular, the signing of a declaration that commits subjects into acting sustainably have an effect while the more subtle incentive "sustainability priming", had limited impact on harvest behaviour. The effect of signing a declaration is less pronounced when there is no competition between the wood buyers. In the real world situation there, however, be competition is the most common situation. Therefore, we recommend the introduction of the possibility of wood buyers to sign a declaration, for example organised by ADEME. Signing a declaration about providing biomass of a certain quality is already implemented in certain regions in France.
- Due to the covid19 restrictions we were not able to carry out the experiment in the field with the professionals involved in biomass harvesting in forest. This would have allowed a further verification of the roboustness of our results.

Perspectives —

Though the funding from Labex Arbre to TISANBIOM has terminated, the projects continues until June 2022 with the funding from ADEME/Graine and we still investigate the possibility to carry our experiments in the field.

Valorization —

- Attallah, M., Abildtrup, J., Stenger, A. 2021. Non-monetary incentives for sustainable biomass harvest: An experimental approach. Working Paper BETA 2021-20.
- Article in revision for resubmission to *Resource and Energy Economics*.
- Presentation at the FUTUR DEPARTEMENT « ECOFA » DE L'INRAE (11/10/2019 à Lyon) as an example of a project involving two INRAE departments.
- Invited speaker at Department of Food and Resource Economics (IFRO) seminar: Non-Monetary Incentives for Sustainable Biomass Harvest: An Experimental Approach, January 22, 2021. University of Copenhagen.

Accepted and presented at the conferences:

- Attallah, M., Abildtrup, J., Stenger, A. 2021. Non-monetary Incentives For Sustainable Biomass Harvest: An Experimental Approach. European Association of Agricultural Economists XVI congress, July 20-23, 2021 Prague.
- Attallah, M., Abildtrup, J., Stenger, A. 2021. Non-monetary Incentives For Sustainable Biomass Harvest: An Experimental Approach. European Association of Environmental and Resource Economists 26th annual conference, June 23-25, 2021, Berlin.
- Attallah, M., Abildtrup, J., Stenger, A. 2021. Non-monetary Incentives For Sustainable Biomass Harvest: An Experimental Approach. Colloque ASFEE 2021 (Association Française d'Economie Expérimentale), 2 &3 Sept, Dijon
- Attallah, M., Abildtrup, J., Stenger, A. 2021. Non-monetary Incentives For Sustainable Biomass Harvest: An Experimental Approach. Colloque FAERE 21 (French Association of Environmental and Resource Economics), 9 &10 Sept Grenoble
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Leveraging effect of the project—

The TAMOBIOM project, which is financed by ADEME, requires 30% co-financing for the scientific research part. Without funding of the present project, BETA would not be able to participate in Tamobiom and task 3 would not be carried out.