# Projection of the bio-feedstock supply and demand for material transition of textile-based products

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Primary focus on the textile domain

## Objective(s)

This study aims to use historical data to develop a forecasting model that should provide insights for decision makers on the future biobased-feedstock availability for the textile domain, including an estimation of the potentially mitigated GHG emissions.

## Main (Key) Result

### *Interdisciplinary iterations of model development*

The main expected key result of this wild card project is a predictive model that could potentially be used in a Decision Support System (DSS). Around the model, an overview of data sources and a wireframe for a prototype dashboard will be part of the results.
To complement the quantitively approach, a workshop is organized to finetune the model with expert elicitation. Figure 1 and Figure 2 illustrate the type of questions that are discussed with experts.
As a final step in this project, a draft manuscript of will be submitted to a scientific journal.

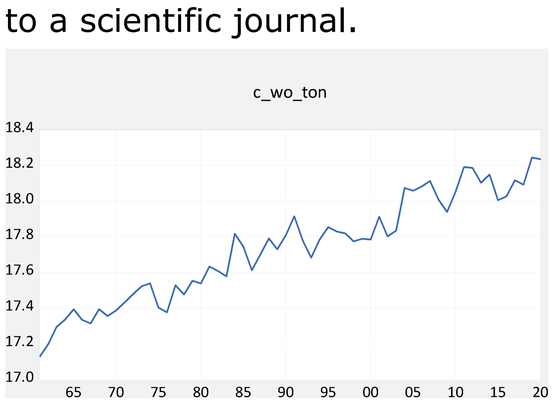



**Figure 1.** Example of a stable growth for global cotton production (T) for the period of 1961-2020

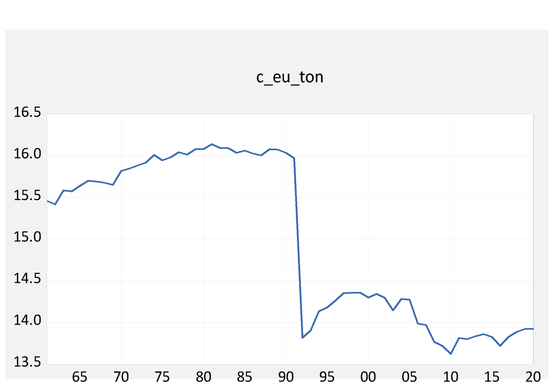


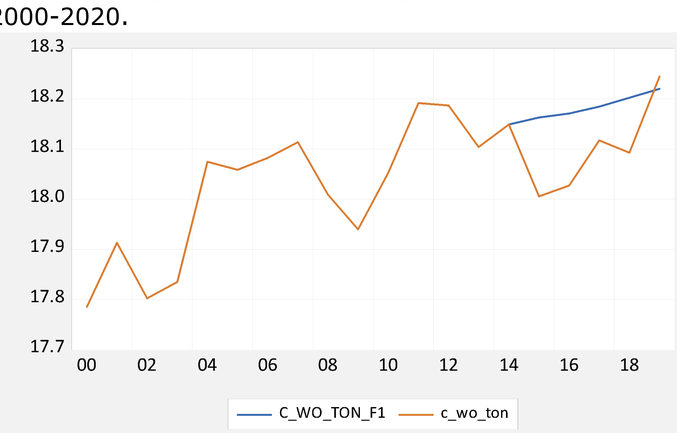

**Figure 2.** Example of a structural break for European cotton production (T) for the period of 1961-2020

## Readiness

### *Societal impact with simple but cutting-edge technology*

At the end of this research project, different stakeholders within the textile domain should be able to use the results to some extent. The model and data should be accessible and reusable to finetune the model. Also for the building material domain, it is expected that the generic approach of the predictive model could be adopted with minor modifications.
**Technology Readiness Level**:
3 building materials domain and 4 textile domain
**Societal Readiness Level**:
2 building materials domain and 3 textile domain

**Figure 4.** Example forecast single-equiation AutoRegressive model of global cotton production (T) for the period 2000-2020.

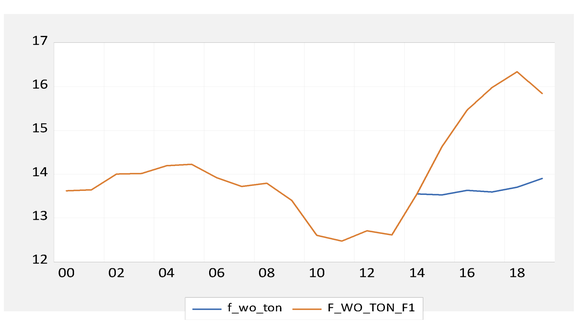



## Lessons learned

### *Scoping and scaling the predictive model*

Although the model that is developed within the current study is based on a small sample of data and workshop participants, the findings suggest to include the needs of biobased and non-biobased products and focus on the textile-based commodities. This could lead to a discussion on substitution effect that is e.g., interrelated with the increasing population growth. Our model indicate that there is no interconnection in the growth-pad between bio-based and non-biobased products, while the common ambition might be to have one market.

**Figure 3.** Example forecast single-equation AutoRegressive model of global flax production (T) for the period of 2000-2020.




## Next steps

### *Explainable and semantic AI*

As next steps it is proposed to further develop the model in iterations with key stakeholders for the relevant years. It might be interesting to see which similar initiatives on a national and international level could be identified to potentially collaborate with and complement the modelling approach and include additional (open) data sources available semantic descriptions in form of knowledge graphs for heterogeneous data integration.

**Figure 5.** Illustration of a knowledge graph

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