

A New Value Chain for Rubber and Inulin Production in the European BioEconomy

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Introduction

DRIVE4EU - 'Dandelion Rubber and Inulin Valorization and Exploitation for Europe', a European demonstration project sets up a European chain for the production and processing of natural rubber and inulin from *Taraxacum koksaghyz* (TKS, Rubber dandelion) to become less dependent on the import of natural rubber.

Natural rubber is a sustainable material that is used for more than 40,000 products, e.g. natural rubber is applied in construction (adhesives, sealants), medicine (gloves, tubing) and transportation (matting, tyres) industries. Because of the specific quality aspects of natural rubber in many products it cannot be replaced by synthetic rubber. At the moment natural rubber is exclusively harvested from the rubber tree (*Hevea brasiliensis*) of which about 90% is grown in South East Asia.

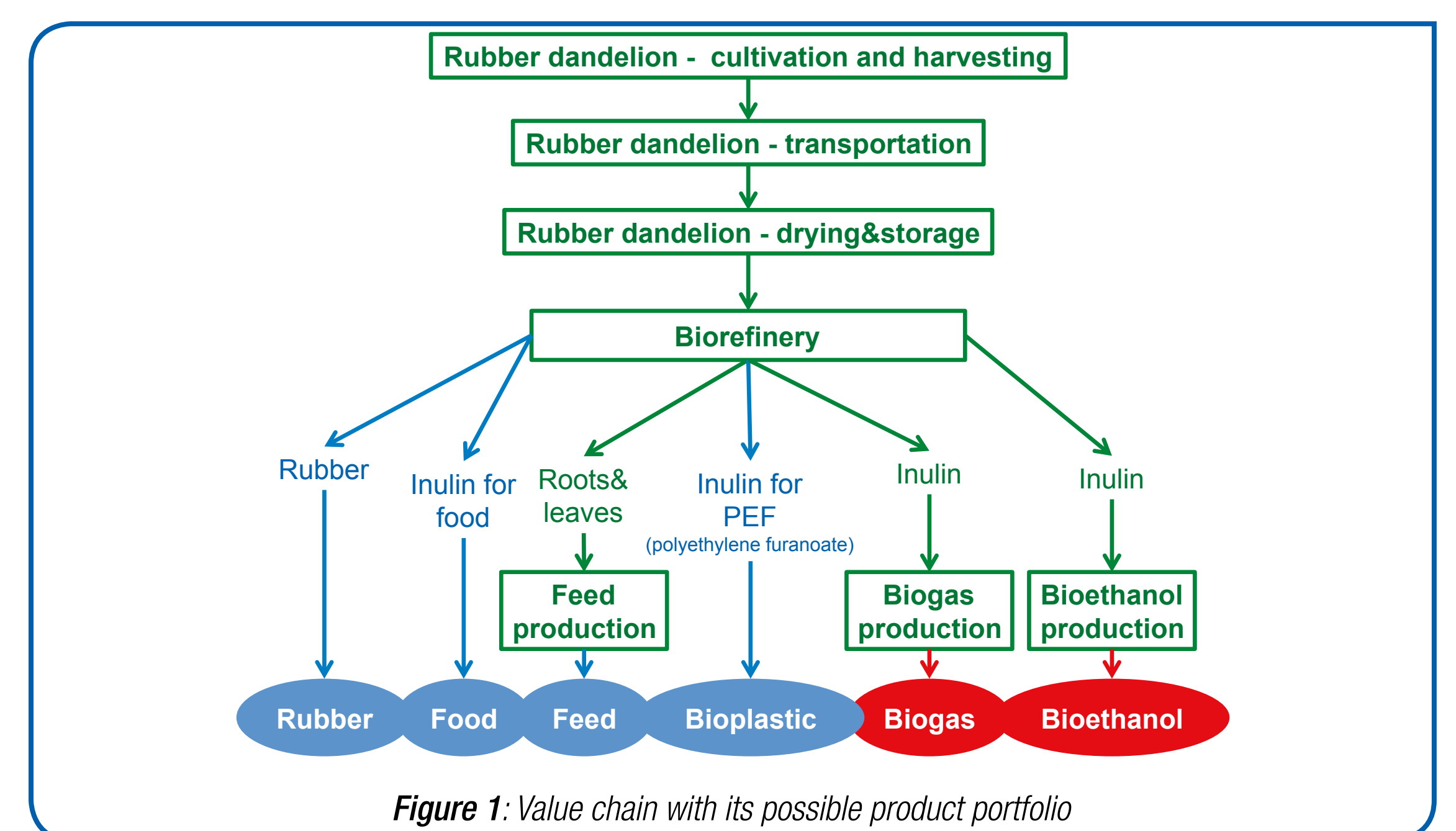


Figure 1: Value chain with its possible product portfolio

Partner:



Whole value chain

DRIVE4EU demonstrates the technical, economic and environmental feasibility of the use of Rubber dandelion as a production platform for natural rubber and inulin, the possible product portfolio is shown in Figure 1. The combination of natural rubber and inulin makes Rubber dandelion very interesting as a new European value chain

The main activities in DRIVE4EU are:

- breeding of plant genotypes with high root biomass, high rubber and inulin yield,
- amplification of seed batches for agronomic tests and large scale demo field trials,
- optimized cultivation (Figure 2) and harvest methods of Rubber dandelion,
- ecological analysis of the gene flow between TKS and wild dandelions,
- scaled-up and optimized extraction and refinery protocol for natural rubber and inulin,
- testing and application of natural rubber and inulin in end product uses, and
- demonstration of the economic viability of the new production chain for natural rubber and inulin.



Figure 2: Cultivation of Rubber dandelion

Economic viability

The economic analysis of rubber and inulin production from Rubber dandelion identifies the putative bottlenecks for the future commercialization. The general economic analysis is based on the consideration of future business cases in "10 years" and "25 years" with rubber and inulin (for food, chemicals, biogas and bioethanol) as main products and co-products: feed and biogas from roots, leaves pulp. The whole value chain from TKS cultivation to rubber and inulin includes the following 7 main processes:

1. Rubber dandelion cultivation and harvesting;
2. Rubber dandelion transport;
3. Rubber dandelion (drying &) storage;
4. Biorefinery (including processing of inulin for food and chemicals);
5. Feed production;
6. Biogas production and
7. Bioethanol production.

The total costs in the whole value chain are dominated by the cost of the cultivation and harvesting (Figure 3) and the cost for biorefining. The other costs for transportation, storage, biogas or bioethanol production are relatively low. An environmental assessment (LCA) will provide information on the impacts of several environmental impacts, e.g. GHG emissions, land use change.

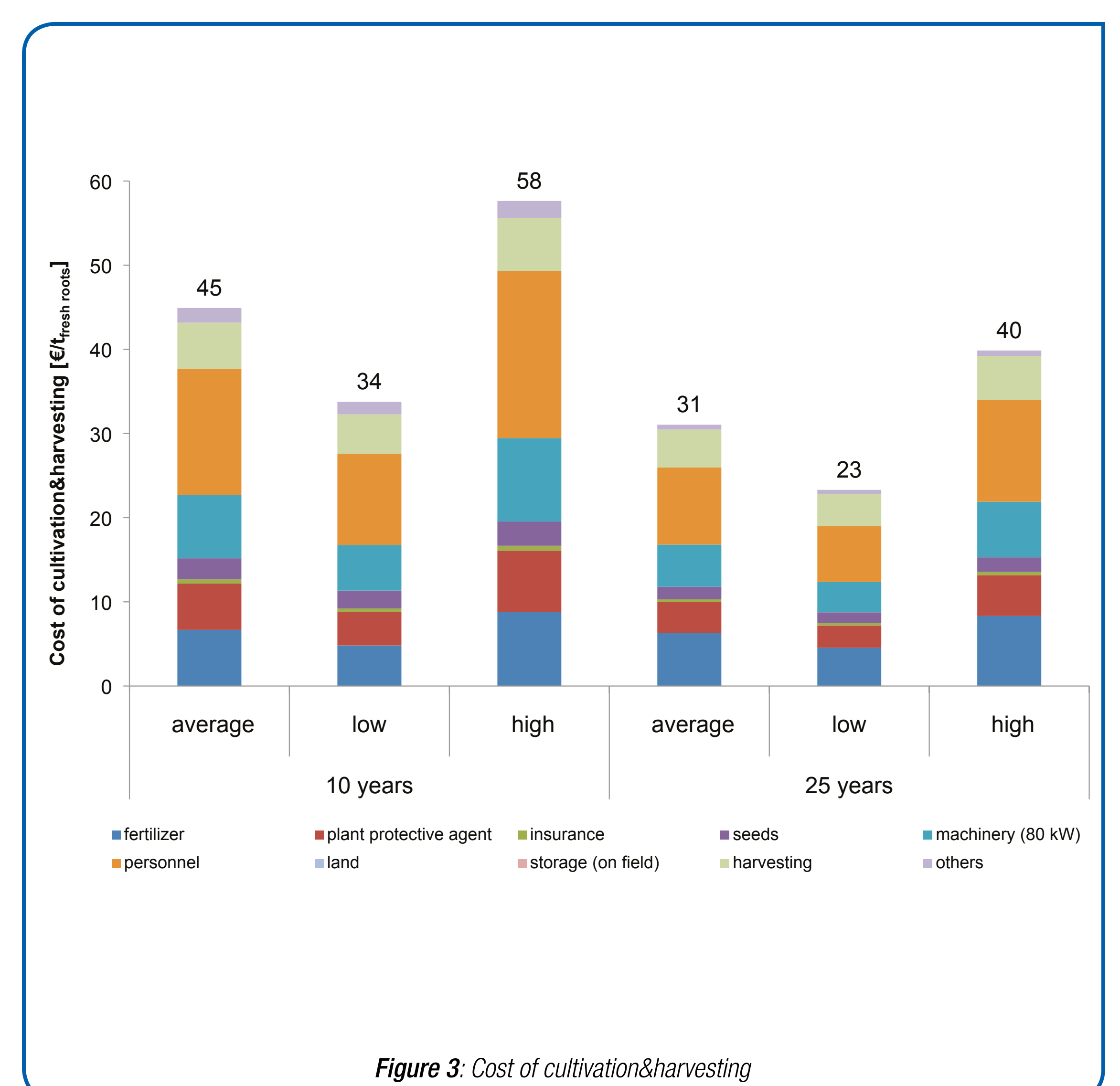


Figure 3: Cost of cultivation & harvesting

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