

LIFE-CYCLE GREENHOUSE GAS ASSESSMENT OF PORTUGUESE CHESTNUT

Diana Rosa¹, Filipa Figueiredo¹, Érica G. Castanheira¹, Manuel Feliciano², Filipe Maia², José Santos², Ana Paula Silva³, Henrique Trindade³, and Fausto Freire^{1*}

1: ADAI-LAETA (Center for Industrial Ecology)
Department of Mechanical Engineering, University of Coimbra
Rua Luis Reis Santos, 3030-788 Coimbra, Portugal
*e-mail: fausto.freire@dem.uc.pt, web: <http://www2.dem.uc.pt/CenterIndustrialEcology/>

2: Mountain Research Centre (CIMO), ESA – Polytechnic Institute of Bragança
Campus de St^a Apolónia, Apartado 1172, 5301 -855 Bragança, Portugal

3: Centre for the Research and Technology of Agro -Environmental and Biological Sciences (CITAB), University of Trás-os-Montes and Alto Douro (UTAD)
Qta. de Prados, 5000-801 Vila Real, Portugal

Keywords: Chestnut; Cultivation; Global Warming; Life-Cycle Assessment (LCA); Processing.

Abstract This paper presents a life-cycle greenhouse gas (GHG) assessment of various chestnut production systems in northern Portugal. Life -cycle models and inventories were implemented for three chestnut cultivation systems and two processing lines (fresh and frozen chestnut). The overall GHG intensity ranged between 0.4-2.7 (fresh) and 0.6-2.9 (frozen) kg CO₂eq kg⁻¹ harvested chestnut. The cultivation contribution to the overall GHG intensity varied considerably (from 0.36 to 2.69 kg CO₂eq kg⁻¹ harvested chestnut) mainly due to different yields and input requirements (diesel and fertilizers) among the three chestnut cultivation systems analysed. The GHG emissions associated with chestnut processing ranged between 0.05 (for fresh chestnut, mostly from propane consumption) and 0.23 kg CO₂eq kg⁻¹ harvested chestnut (for frozen chestnut, mainly due to electricity consumption). The results demonstrate the importance of cultivation management practices, in particular an efficient use of fertilizers in order to minimize the GHG intensity of Portuguese chestnut.

SOCIAL SUSTAINABIL

Chongyang Du^{1*}, L

1: Depart

Rua Luis Rei
e-mail: chongyang.d

2: Depa

Un
e-mail: luiz.kulay@

3: INESC

Un
e-mail: Imc

Keywords: Sugarcane, Bioethanol,

Abstract Brazil has the largest continuously growing with the i markets. However, the Brazilian su impacts on the well-being of sugarcane production activities. T social sustainability performance stakeholders, including workers, lo harvesting activities involve high r concerns for the workers and the will improve the working condition job loss in consequence places a m governments – Federal and from t regional economic development concern on the social exclusion o level through sustainability certifi