Tropentag, September 17-19, 2018, Ghent

"Global food security and food safety:
The role of universities"

The Potential of Acrocomia Value Webs for Rural Development and Bioeconomy in Paraguay

Ricardo Vargas-Carpintero, Johannes Mössinger, Regina Birner

University of Hohenheim, Inst. of Agric. Sci. in the Tropics (Hans-Ruthenberg-Institute), Germany

Abstract

Acrocomia ssp is a native palm tree in Latin America which produces rich oil-bearing and drupaceous fruits traditionally used as food and fodder. Acrocomia fruits are composed on a dry matter basis by epicarp (19 %), mesocarp (42 %), endocarp (31 %) and kernel (8 %), varying among species and biophysical conditions. Considering a plantation system of 400 palm trees per hectare, suitable to agroforestry, high yields of fruits (20 t ha^{-1}) and oil (2.5 t ha^{-1} of kernel and pulp oils) are projected. In addition, remaining fruit components have several uses, which makes Acrocomia a promising crop in the bioeconomy. Through industrial processing, oil is extracted from pulp and kernel (lipids 45-60 % and 61-68 % dry matter). Husk, endocarp and pressed cakes result as by-products. *Acrocomia* oils have industrial applications in pharmaceutical, cosmetics and food sectors as well as a biofuel source. Husk and shell are used as solid fuels and potentially as input for activated carbon and charcoal. Pulp flour can be used as a food product while kernel and pulp cakes are utilised in animal nutrition. Further applications are being progressively studied, as well as agronomic aspects, cultivation, breeding and crop management. Paraguay, an agriculture-based country located in the Neotropics, is a natural habitat of Acrocomia. This wildly growing palm gained economic importance by mid of the 20^{th} century with the emergence of industry for oil extraction. It is considered as an alternative crop to diversify income sources for peasant and smallholder family farmers. They represent 80 % of farms in Paraguay and increasingly face multiple socio-economic challenges associated to agribusiness activities. Using the approach of biomass value web as a multidimensional and holistic framework, this research aims to analyse the existing Acrocomia value chains in Paraguay, identifying opportunities and constraints for further upgrading. Complementary, a bottom-up Acrocomia adoption initiative in the region of San Pedro del Paraná (Dep. of Itapúa) is studied. Through an economic analysis of a small-scale (pre-) processing system of Acrocomia fruits, different scenarios for local value addition are built, integrated with an outgrower scheme for the development of inclusive and pro-poor biobased value chains.

Keywords: Alternative oil crop, biomass value web, biorefinery, cascading use of biomass, pro-poor value chain, small-scale processing, value chain analysis

Contact Address: Ricardo Vargas-Carpintero, University of Hohenheim, Inst. of Agric. Sci. in the Tropics (Hans-Ruthenberg-Institute), 70593 Stuttgart, Germany, e-mail: ricardo.vargas@uni-hohenheim.de