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Is Food Security Sufficiently Taken into Account in Estimates of Global Biomass Potentials for Non-Food Uses?

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Abstract

Given the finiteness of the global petroleum reserves accessible to humans, the need to find ways to replace energy from fossil fuels with fuels from alternative sources is apparent. Global awareness to this predicament has been growing over the recent decades. As a result, biofuels, bio-oils, biogas and other biomass uses for industrial purposes have become important non-fossil replacements. Consequently, the demand for biomass for non-food use is steadily growing but arable land and hence biomass resources are limited‰despite being 'renewable'. Over the last 20 years a growing body of scientific research engaged in modelling the future biomass potentials, especially for energy uses. This research aims to review how and to what degree food security dimensions are reflected in estimates of biomass potentials for non-food uses.

A systematic literature review showed that the predicted future biomass potentials are highly divergent. This is mainly due to the heterogeneity of methodologies, assumptions and datasets employed. Fundamental to all approaches, however, is the question of how to balance land availability for energy production with land resources required to secure food provision. Yet, despite being a central element of the modelling approaches, food security is so far not well included in these models. Most studies ignore a balanced dietary composition (e.g., vitamin or micronutrient requirements) and food requirements are typically reduced to basic per capita caloric intake. The per capita intake is then extrapolated to 'world regions', underrepresenting in most cases local disparities in food availability or socio-economic access. Moreover, several of the basic assumptions regarding future agricultural intensification, yield growth or consumption patterns (e.g., a drastic reduction in animal protein consumption) seem unlikely to materialize and may cause a considerable underestimation of agricultural land requirements.

The complexity of food security is so far not well addressed in biomass potentials and data gaps for regional break-downs, as well as trade flows, and price changes need to be closed to avoid unsustainable policy decisions based on overestimating future biomass potentials.

Keywords: Bioenergy, biomass potentials, food security

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