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Bachelor-Thesis

Agricultural Science

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**The Potential of Bamboo as a Source of Renewable Energy in
Northern Laos**

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ABSTRACT

In northern Lao PDR, large areas of land are covered with bamboo-dominated secondary vegetation as a result of fallow-based crop rotation, with frequent slash and burn activity. Regarded as a weed in forestry practice, the potential of bamboo biomass as a source of renewable energy tends to be underestimated. Increasing living standards and industrialisation in Southeast Asia have created a high demand for energy. For sustainable development, this demand should be covered at least in part by renewable energy sources. Charcoal from bamboo is considered a CO₂ neutral source of energy and presents a new potential export product for Laos.

In Laos, bamboo is widely used as a construction material for houses, fences and handicrafts, the fresh leaves are fed to cattle and shoots are used in local cuisine. Native people are able to distinguish different species of bamboo and attribute them with special properties, deeming them appropriate for different purposes. Despite its many uses and its irreplaceable importance in the every day life of people in Laos, its abundance makes it a non-marketable resource. Local communities regulate the fallow management to some extent and certain areas are left to bamboo growth. However, no regulations about cutting and use of bamboo exist.

In this study a compilation of indigenous knowledge of bamboo species and their uses, as well as a botanical classification of the most abundant bamboo species are given. Information on abundance and preferred sites was also documented. The various species were analysed with respect to their growth and biomass production. Culm-length, internode-length, diameter and wall thickness were measured for single culms. Total fresh biomass was determined for complete stands of bamboo. Biomass of bamboo in areas with a known period of fallow was measured to assess the temporal growth potential.

Based on the presented data, recommendations for field measurements can be given that are essential to assess the overall potential of bamboo. The combination of indigenous knowledge with field measurements and laboratory analyses as an innovative methodology can be applied to other biomass assessment problems.