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“Filling gaps and removing traps
for sustainable resource management”

Sustainability Hot Spot Analysis of Insect Supply Chains for Food and Feed

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Abstract

In western countries, using insects as food and feed is still at a very early stage in comparison to many countries in Global South, where insects are an integral part of people's nutrition. Globally, experts predict a market growth for insect-based products and insects itself as food within the next years, based on higher demand through an increasing world population and the need of alternative protein resources for human nutrition. Nevertheless, insect rearing is new everywhere and the larger scale production systems are mostly found in western countries. This raises the question if insect production can remain sustainable in future, in terms of social acceptability and economic viability as well as resource effectiveness and efficiency. One of the possible approaches to measure the sustainability of value and supply chains holistically, but in a simple manner, is the Sustainability Hot Spot Analysis (SHSA), developed by the Wuppertal Institute (Germany). We applied this approach for the first time on insects for food and feed. We supplemented the existing SHSA method with economic categories, since insect supply chains are hardly researched due to rare practises of insect farming. So far, economic aspects have not been considered in the current literature on SHSA. Beside this, ethical and ethnical aspects need to be taken into account in the social categories. Ethnical aspects contain e.g. justifying the killing of insects in different religions, whereas the ethical aspects refer to welfare issues such as animal husbandry, herd management as well as transport. Our preliminary analysis showed that within the phase of insect rearing, hot spots were identified for energy consumption caused by e.g. fodder production as well as in disease and pest management. In addition, further hot spots were identified in the processing phase also concerning energy consumption due to e.g. grinding, dehydrating, mechanical drying as well as freeze-drying. The next planned step is to put the focus of the SHSA on selected edible insect species, like field crickets (*Gryllus bimaculatus*), bamboo worm (*Omphisa fuscidentalis*), palm weevil (*Rhynchophorus ferrugineus*) as well as black soldier fly (for feed) (*Hermetia illucens*) and conduct additional stakeholder analyses.

Keywords: Economy, environmental and social impact, insect farming and processing, LCA, resource efficiency