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Production and Processing of Edible Insects for Improved Nutrition

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Using a Hot Spot Analysis as the basis for target group specific training materials on insect rearing

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Background

- Entomophagy is in many Asian, Latin American and African countries part of their culture.
- Most consumed insects are collected and only seasonally available.
- Worldwide, insect rearing is on the rise, but in Myanmar and Madagascar insect rearing is new and not common, whereas insect consumption is part of the culture.
- We focussed on the question if insect rearing is sustainable and how we can adapt the rearing to local conditions.

Objectives

- Identifying sustainability hot spots of insect rearing in Myanmar and Madagascar.
- Elaboration of the potential for typical rearing technologies to local conditions for successful implementation in both countries.

Materials and Methods

- The Sustainability Hot Spot Analysis (SHSA) is a tool for identifying social and ecologic potential problematic aspects along the entire life cycle of a product.
- Based on the knowledge of the European insect value chain, expert interviews with different stakeholders were conducted for a better understanding of especially one concrete step of the value chain - the insect rearing.
- The interviews were conducted with special consideration on the social and environmental aspects of the SHSA.

Tab. 1: Environmental and social aspects, which were considered in the SHSA.

Environmental Aspects	Social Aspects
Raw materials	General working conditions
Energy resources	Social Security
Water resources	Training and education
Land use	Workers health and safety
Waste	Human rights
Emissions to air (incl. GHG)	Living wages
Emissions to water	Consumer health and safety
	Product quality

Results

- Most hot spots were identified for the social aspect ***Training and education*** and the environmental aspects ***energy resources*** and ***raw materials*** like feed for the insects or insect eggs
- The lack of ***knowledge*** and ***literature***, lack of nationwide supply of electricity and lack of feed for insects are major problems

- Need for target group specific training materials, as the gap between educational levels and reading skills is wide.
- ***For farmers*** more visual and simple on-hand materials with practical parts

Fig. 1: Examples of figures of the training manual for farmers.
Left: best location for an insect farm. Right: correct texture for egg laying substrate for Black Soldier Fly (*Hermetia illucens*)

Adaption strategies

Selected examples for adaption strategies of insect rearing to local conditions

Fig. 2: Black containers keep warm for regions with cold nights. Use sticks, if egg carton is not available.

Fig. 3: Species selection – Black Soldier Fly (*Hermetia illucens*) for livestock feed, as they convert organic/kitchen waste into healthy protein.

Fig. 4: Collect insects from nature and start rearing them, if e.g. cricket eggs are not available. Feed them first with plants, like salad, carrots or pineapple leaves, that are common to them.

Conclusion

- The Sustainability Hot Spots were mostly detected for the social aspects concerning knowledge.
- For successful implementation, trainings and training materials, like brochures and posters, need further adaption to local conditions that also differ between Madagascar and Myanmar.

Outlook

- If insect rearing increases in Myanmar and Madagascar, the frass and waste treatment might become another Hot Spot
- This aspect has to be taken into account in further SHSA interviews and studies.

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