Federal Ministry
of Food
and Agriculture

CALL ProciNut

Production and Processing of Edible Insects for Improved Nutrition – Subproject 2

ProciNut: Production and Processing of Edible Insects for Improved Nutrition – Subproject 2

country/countries	Myanmar and Madagascar
funding agency	Federal Ministry of Food and Agriculture – BMEL
project management	Federal Office for Agriculture and Food – BLE
project coordinator	International Center for Sustainable Development (IZNE) – University of Applied Sciences Bonn-Rhein-Sieg
project partner(s)	FOFIFA (Madagascar), ZEF – University Bonn (Germany), Institute of Nutrition Mahidol University (Thailand), Kasetsart University (Thailand), Spectrum (Myanmar), University of Antananarivo (Madagascar), Welthungerhilfe (Madagascar), Yezin Agriculture University (Myanmar)
project budget	Subproject 2 IZNE (FKZ 2816PROC07): 73.056,25 Euro
project duration	01.10.2018 – 31.03.2022

key words	Nutrition, Entomophagy, food security, insect rearing, trainings, small scale farming, sustainability, south-south-cooperation, gender equality, value chain, knowledge transfer, capacity building
background	Across the world the diet is dominated by livestock and crop species, but many nutritious and promising food sources are neglected. There are around 2,000 edible insects, of which many have a high profile of nutrients (proteins, vitamins, minerals, amino acids), a high feed conversion rate and low greenhouse gas emissions (van Huis 2013). In about 113 countries (Rumpold and Schlüter 2012), entomophagy (i.e. human use of insects for food) is culturally accepted and finds around two billion consumers (Halloran et al. 2014), most of them living in the tropics. The FAO (2013) has recognized the colossal role that the diversity of insects can play, if properly managed and utilized, in fighting malnutrition. Edible insects, so far still a niche topic, bear a large potential in contributing to protein enriched diets for the predicted world population of nine billion by 2050. Especially in Sub-Saharan Africa (SSA), South and parts of South East (SE) Asia insect consumption is common yet many countries in these regions struggle to meet the SDG target 2 on achieving food security. It calls for innovative approaches in exploring alternative food sources, their production, processing and prevention of nutrient or food losses along the value chain, yet research is limited. The high nutritional value of edible insects is widely recognized (van Huis 2016, Rumpold and Schlüter 2015, Bukkens 2005). They often play an important role for diet diversity, a fundamental aspect of good nutrition (Keding et al., 2013; Tontisirin et al., 2002) and in filling overall animal protein gaps in diets as they have the same amount of protein content as ruminant meat. They also address seasonal gaps of micronutrients (van Huis 2016). Often consumption increases, when staple food stocks come to an end, before harvests and during seasons, when less meat is available (FAO 2013). Among consumers the nutritional value of

	edible insects is often unknown and they are generally neglected by extension services and policy makers. Most edible insects are seasonal and their consumption is limited to killing and eating or cooking (frying, fritters, curries, soups, etc.) when available, and their potential of preservation, processing and storage remains highly underexplored (Johnson 2008, Dossey et al. 2016).
objective	The ProciNut project aims to use the nutritional and economic potentials of edible insects by - establishing and improving small-scale farming - production of safe and nutritious end products with increased shelf life using different processing techniques - reducing the (often seasonal) nutritional insecurity of households - improving the economic situation of rural women and close gender gaps - facilitating capacity building and knowledge exchange for development agents and farmer - promoting South-South-Cooperation between Madagascar, Myanmar and Thailand.
results	Through the activities of the IZNE, manuals on the production and processing of insects as food and feed have been produced. Fact sheets have also been developed and video recordings made. In cooperation with the international partners and experts, both on-site and digital trainings were conducted.
recommendations	The enormous potential of edible insects is becoming better known worldwide. Accordingly, research and knowledge exchange are becoming more important. At the same time, it is essential that communication and public relations work reduce inhibitions such as disgust and instead arouse curiosity. This is possible through educational work. Corresponding topics should be considered in further projects. In addition, the

	principle of learning-by-doing and trying out unconventional ways of working is helpful and purposeful, which is often neglected in research.
photos	Insect rearing house in Sandrandahy (Madagascar). Photo: RAKOTONANTOANDRO Lalaina  Training in rearing of different cricket species in Keng Tung, Myanmar (2019). Photo: Isabelle Hirsch 

Training in rearing Black Soldier Fly (Hermetia illucens) in Sandrandahy, Madagascar (2019). Photo: Isabelle Hirsch