1. Introduction

A growing amount of attention is being placed on the potential of edible insect species to address food and nutrition security (1,2). Even greater attention is being directed towards the handful of insect species that can be easily domesticated and raised *en masse*. Globally, the oldest and most developed example of cricket farming for human consumption comes from Thailand. For nearly 20 years, thousands of rural Thais have adopted and developed these unique farming systems, providing not only food for their households but also employment and income (3–5). This development has resulted in the subsequent promotion of cricket farming systems in rural communities in low- and middle-income countries (LMICs) such as Kenya.

In Kenya, different kinds of insects such as ants, termites, crickets and lake flies have been consumed by various ethnic populations (6–10). Activities supporting the development of cricket farming systems have occurred in the Lake Victoria region of Kenya since 2012 (11). The ubiquity of malnutrition and food insecurity has been a motivating force to explore the potential of increasing insect consumption in Kenyan households (12).

At the same time, the dire need to shift towards more environmentally sustainable diets has highlighted edible insects as a potential alternative to traditional livestock such as cattle and swine (1,13,14). Physiological and biological differences between insect species and other conventional livestock species mean that insects do not use their metabolism to maintain body temperature, and, therefore, use resources more efficiently (13).

While the potential benefits of cricket farming to nutrition, livelihoods, and the environment are becoming increasingly known to a wide range of actors, the dynamics of these systems are still understudied. Thus, an enhanced understanding of the value chain, legislation and regulations, impacts on rural economy, and possible improvements in production methods and techniques is required. Moreover, investigation of the linkages between agriculture and nutrition is essential for the creation of more socially, environmental, economically and culturally sustainable food systems.

1.2 Objectives of the PhD thesis

The main objective of this thesis is to assess the impact of cricket farming on rural livelihoods, nutrition, and the environment in rural Thailand and Kenya. The specific objectives of this thesis are:

1. To conduct four cases studies in Thailand, Kenya, Switzerland, and Canada on the actions that have been taken or are underway to develop the various multi-jurisdictional regulations and legislation governing the farming, collection, and consumption of insects (Paper I)
2. To review studies on the life cycle assessment of edible insect production systems and to develop a reference framework for future life cycle assessments on edible insects (Paper II)
3. To perform a life cycle assessment of cricket farming in north-eastern Thailand in relation to broiler chicken farming (Paper II)
4. To conduct a preliminary assessment of cricket farming as a livelihood strategy in north-eastern and northern Thailand (Paper IV)
5. To evaluate the determinants and barriers to the adoption of cricket farming in rural Kenya (Paper V)