



Lessons Learned

from Flying Food project Kenya and Uganda 2015-2019

October 2020

1. Ambition Flying Food

The Flying Food initiative facilitates the insect-for-food value chain in sub-Saharan Africa, with a special focus on crickets. The aim is to provide a sustainable alternative for (more expensive) meat, dairy and fish products, to stimulate better nutrition (contributing to SDG 2), to boost employment and income generation in rural areas, especially for women (contributing to SDG 8 and 5) and to reduce the environmental footprint of protein production (SDG 13). Ambition is to establish a sustainable cricket value chain with a sound business model and scale the cricket-business to 10 countries in sub-Saharan Africa.

2. Flying Food Consortium

The founders of Flying Food are based in the Netherlands:

- [TNO](#) - Independent applied research institute;
- [WFBR](#) – Wageningen Food and Bio based Research;
- [Protifarm](#) / Kreca Entofood Ltd – Insect breeding company;
- [NGN Ltd](#) – Insect related consulting, training and processing company.

In several countries in sub-Saharan Africa we have local partners in supply and demand of crickets, trainings institutes, knowledge centers and governments.

3. Flying Food project Kenya and Uganda 2015-2019

From 2014-2018 the Flying Food project successfully established rearing, processing and retailing of crickets in Kenya and Uganda through an international public private partnership supported by Netherlands Enterprise Agency (RVO). At the end of the project 120 smallholder farmers, including 80+ women, were actively rearing crickets, with 400 additional farmers prepared to start. Two middle-scale companies had been established with the combined potential to deliver 50 tons of crickets per annum. Three processing companies were drying, grinding and packaging crickets and delivered them to a total of 10 market outlets as snacks or flour. At full capacity, the existing supply chain had a potential of delivering 5.000.000 servings per annum. The created value chains were built on a sustainable business model.

But full capacity has never been met, because in the last year of the project, the cricket populations in both countries were affected by a bacterial infection. This event resulted in a temporary close down of many farmers and a restart of their production was needed with a new healthy parent stock. However a large number of farmers didn't restart due to a decrease of guidance since the project was closed. Unfortunately, the value chain was too fragile at that moment and extra efforts are required to rehabilitate this innovative, high potential insect value chain. More information on the completed programme is available on the project website www.flyingfoodproject.com, in the Kenya [evaluation report](#) of the project made by SEO and [a positive reaction of RVO](#) on the evaluation report.

Despite the critical evaluation report the Dutch Enterprise Agency (RVO) endorses the Flying Food project and supports the team in using the valuable lessons learned:

“We rank this initiative as promising with respect to relevance for income generation, job creation for women, food security and climate action. With lessons learned from this pilot, including methods to overcome the bacterial infection, a sustainable approach in cricket rearing has been developed. The Flying Food initiative is now moving to the next stage of design and implementation: not limited to Kenya and Uganda, but also to other Sub-Sahara countries.”

The Dutch Enterprise Agency (RVO) – funded the Flying Food initiative from 2014 - 2018

4. Lessons Learned

Worldwide, insect production for food consumption is still at an early and immature stage. What has been established in Kenya and Uganda was innovative and challenging; introducing a new product into a new market. As a team we like to share our lessons learned and hopefully inspire you with our journey. The following learnings and insights are the main ingredients for our new approach:

- The hygiene in cricket egg production facilities has to be brought to a higher standard to prevent future infections. The bacterial infection of 2018 has been overcome and research has shown that the infection was not transferrable from female cricket to her eggs. This means that mitigation measures are possible e.g. by disinfecting the eggs. Infections are known to appear regularly in other livestock farming, so cricket production has to deal with it as well. Other insect farmers also face infections and they take corrective measures or restart their production;
- The yield in production was low due to fluctuating temperatures. Crickets prefer a constant temperature of 28-32°C at day and night. Especially at night-time it appeared to be too cold for the crickets which hampers efficient growth;
- Training and support between smallholder cricket farmers appeared to be insufficient. Extra training and guidance by professional trainers is required to assure high quality cricket production;
- Organizing a solid market demand for crickets is key for achieving a sound business case for farmers. More emphasis should be paid on value chain development, organising supply and demand and ultimately having an upfront market pull.

5. Lessons learned integrated in our new approach

With our new approach will envision to improve yield and sales:

1. Organizing **market demand** for crickets. We will launch cricket samosa's, fried crickets as snack or in sauce, cricket powder for fortified porridge and cricket cookies. Food processors will be attracted who will market and launch the cricket derived food products;
2. Start with **medium cricket farms using 500 crates**, including large scale reproduction units with a strict set of hygiene rules and practices. Entrepreneurs will be trained thoroughly and supported in a step-by-step approach towards a 500 crates size. When these medium farms are producing at full capacity, 100-150 smallholder farmers in the same area are attracted to start cricket production with 20-30 crates each. The medium farm will supply clean eggs to smallholders, who will do upbreeding and sell the adult crickets to the medium farm. In this out grower model, the medium farm organizes sales to market. By separating reproduction from upbreeding at smallholder farms, the risk of bacterial infections is considerably reduced. Reproduction (parent stock and hatchery) requires hygienic circumstances which can be better organized at a larger centralized farm. Guidelines for rearing crickets and key figures for the business model are published at www.flyingfoodproject.com;

3. Obtaining constant temperature at the farm. This is kept around 30°C day and night at the medium sized cricket farms by **insulation of the farm building and with additional heating** and ventilation system. This will reduce cycle times for reproduction from 12 to 6-8 weeks, thus improving yield with 33-50%. A technical design for a small and medium sized farm with energy efficient building materials and climate control on off-grid sustainable energy is provided by TNO and a summary is published on www.flyingfoodproject.com;
4. **Structural training** and practical guidance of farmers – live and virtually. Knowledge transfer is organized on several levels:
 - ✓ the Flying Food consortium can provide a train-the-trainer programme;
 - ✓ a cricket knowledge and business center will be established in each country. This center provides training to farmers using a mobile training unit – a small truck with a full breeding set up which can be used for trainings on the spot, events and fairs to showcase cricket farming and the cricket-based food products;
 - ✓ a curriculum on cricket farming will be developed with a vocational training institute, and accredited;
 - ✓ mutual learning between farmers will be supported. Most farmer groups are organized in teams of 10- 20 farmers. Live meetings will be organized to exchange experiences and learnings as well as virtually in WhatsApp-groups;
 - ✓ additionally an online training course using serious gaming will be developed to learn cricket farming.

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