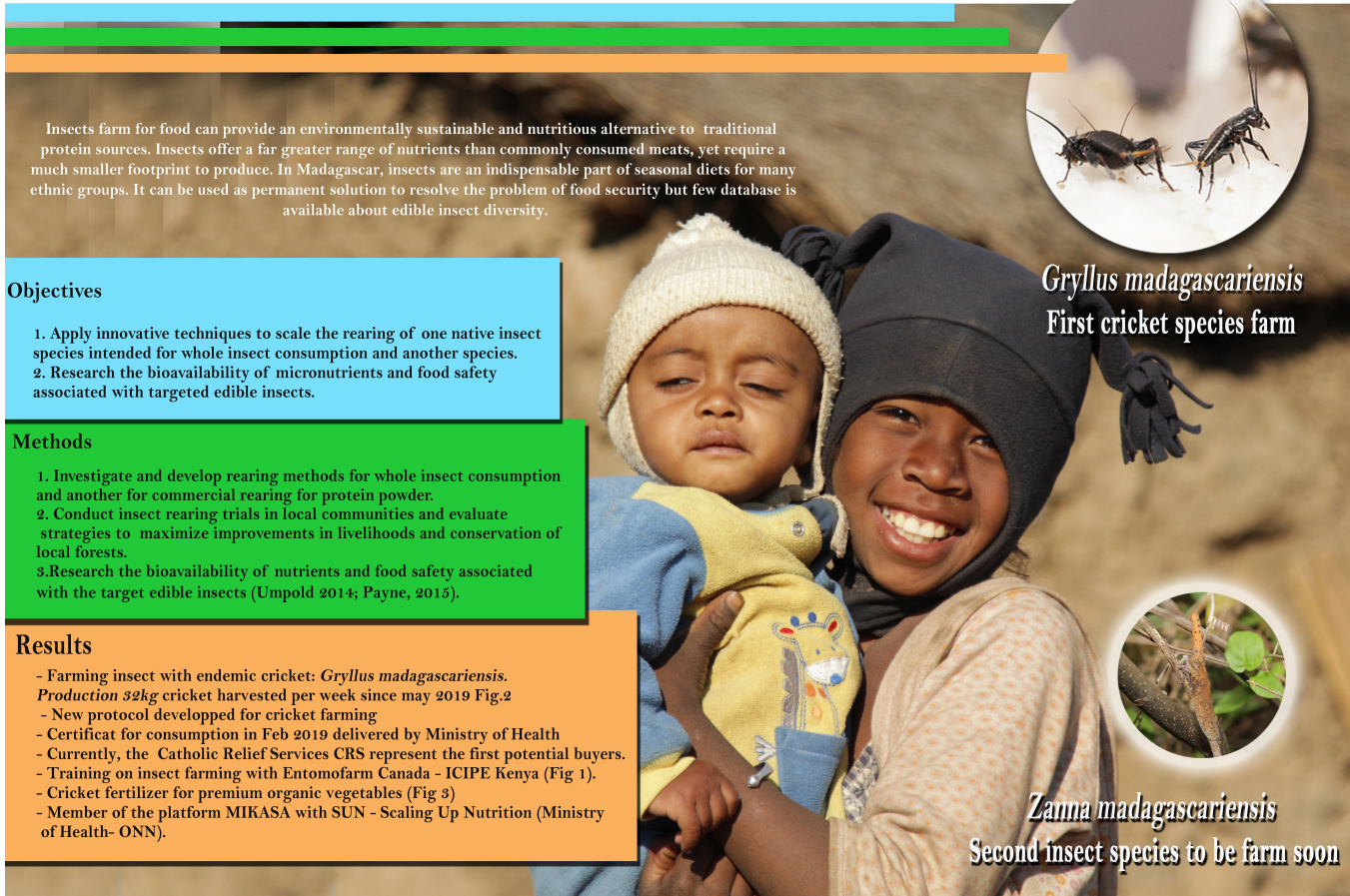


# A new source of protein: edible insect to fight malnutrition in the South of Madagascar

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Insects farm for food can provide an environmentally sustainable and nutritious alternative to traditional protein sources. Insects offer a far greater range of nutrients than commonly consumed meats, yet require a much smaller footprint to produce. In Madagascar, insects are an indispensable part of seasonal diets for many ethnic groups. It can be used as permanent solution to resolve the problem of food security but few database is available about edible insect diversity.



*Gryllus madagascariensis*  
 First cricket species farm



*Zanna madagascariensis*  
 Second insect species to be farm soon

## Objectives

1. Apply innovative techniques to scale the rearing of one native insect species intended for whole insect consumption and another species.
2. Research the bioavailability of micronutrients and food safety associated with targeted edible insects.

## Methods

1. Investigate and develop rearing methods for whole insect consumption and another for commercial rearing for protein powder.
2. Conduct insect rearing trials in local communities and evaluate strategies to maximize improvements in livelihoods and conservation of local forests.
3. Research the bioavailability of nutrients and food safety associated with the target edible insects (Umpold 2014; Payne, 2015).

## Results

- Farming insect with endemic cricket: *Gryllus madagascariensis*.
- Production 32kg cricket harvested per week since may 2019 Fig.2
- New protocol developed for cricket farming
- Certificat for consumption in Feb 2019 delivered by Ministry of Health
- Currently, the Catholic Relief Services CRS represent the first potential buyers.
- Training on insect farming with Entomofarm Canada - ICIPE Kenya (Fig 1).
- Cricket fertilizer for premium organic vegetables (Fig 3)
- Member of the platform MIKASA with SUN - Scaling Up Nutrition (Ministry of Health- ONN).



Fig 1. Training on cricket farming with Aran from Entomofarm Canada

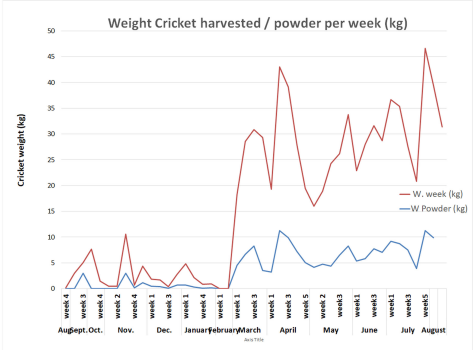


Fig 2. Cricket farm production since August 2018. New protocol developed with exponential production since March 2019.



Fig 3. First test field to test the cricket frass for agriculture in June 2019 and the content of the frass based on 100g Cricket fertilizer contents, analyses from lab. FOFIFA 2019.

Slope	C (N)	Mg (N)	C/N	P (ppm)	P soil (N)	N (N) Total	N (N) Humic (N)	N (N) Nitroque (N)
Correct	23.7	88.0	4.50	0.15	0.02	5.6	0.70	0.095
Slope	Fe (N)	Mn (ppm)	S (ppm)	Ca (N)	Mg (N)	Nu (N)	Zn (ppm)	
Correct	0.20	170	538	1.15	0.360	0.360	1.42	118.4

## Conclusion

With this new protocol developed, scaling up our production to produce 100kg of cricket per week represent a new key solution for a sustainable solution to fight malnutrition in the south of Madagascar. Cricket frass is an potential fertilizer for a premium agriculture. We thought that the success of this project is not only based on cricket production but also on the availability of the funding that can be used to extend the facilities associate with strong partnership with the government, NGOs working on food security and the local communities.

## Acknowledgement

We thank USAID for the grant, A. Ravelomanana from Madagascar Biodiversity Center MBC and B L Fisher from California Academy of Sciences, USA) to make this project possible. Many thanks to the arthropod team at the MBC (B Rajemison, I. Rakotomalala, I Ratsimbaharjaona, N Ravelomanana, T Rajoelison, M Ramanantson, and field team lead by JJ Rafanomezantsoa, C Randrianandrasana, C.Ranaivo), Staff form Entomofarm CANADA D. Goldin, A Hinton.

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