

Enhancing the sustainability of insect rearing systems for nutrition through a multidimensional potential assessment framework

Ingo Wagler - Center for Development Research (ZEF), University of Bonn

Background

- Insect rearing systems as a potentially sustainable food source are being developed & introduced at a rapid pace
- Increasing reports about failures and underestimated risks
- No standard or systematic approach to assess the actual potential of insects for nutritional goals in a given context
- Application to highly food insecure case study area of Sandrandahy in Amoron'i Mania Region in the central highlands of Madagascar

ENTOMOLOGY:

Local inventory and profile of edible / potentially farmable species:

Species	Malagasy name	Common name
<i>Ambylakis nigrolimbata</i>	Sakivy	Madagascar cricket
<i>Gryllus madagascarensis</i>	Akitra	Field cricket
<i>Cyrtacanthacris tatarica</i>	Vaiala	Locust
<i>Gastrimargus africanus</i>	Vaiala	Grasshopper
<i>Borocera madagascarensis</i>	Landibe	Wild silkworm
<i>Cicadoidea</i>	Jorery	Cicada

SOCIOLOGY:

Acceptance: Share of insect eating population (approx. 75%+)

Marketability: Consistent reports of insufficient supply and willingness to buy

Nutrition needs: Prevalence of chronic malnutrition very high (55%), esp. proteins

Innovation capacities: Underutilization of social capital (esp. financial and labor) very low – resilience

ECOLOGY:

Climatic conditions: High inter-seasonal variability, affectedness to climate change - high

Resources availability: Long dry/cool lean season, chronic water scarcity, intense ecosystem stress

Risks: Invasive species, insect plagues

Insects as food -
multidimensional
potential
assessment
framework

Fig.2: Primary assessment categories of framework

Results

- All-over potential for insect rearing for nutrition in the case study area is considerable
- Acceptance and demand of insects as food is high across gender and age groups
- Needs of protein rich / resource efficient food sources is very high
- Human and natural resources availability is severely limited
- Six local species which are edible and potentially farmable have been identified



Pic.2: *Ambylakis nigrolimbata* laying eggs during the first rearing trials

Materials and Methods

- Secondary data:

Fokontany (local) level data on chronic and severe malnutrition, demography and key socio-economic & development indicators

Seasonal/climate, environmental and biological data on different insect species

- Primary data:

The primary data collection was conducted during an interdisciplinary research mission in October 2018 and two follow-up visits in 2019

Gender and age disaggregated thematic focus group discussions in four locations of Sandrandahy

Key stakeholder interviews at national, regional and commune levels

Transect walks with villagers to edible insect collection sites

Insect inventory through traps, interviews with pictures and systematic searches



Pic.1: Gender and age disaggregated focus group discussions in Sandrandahy, October 2018

Discussion

- No single species meets joint criteria of being widely accepted as food, well adapted to the climate and known for its suitability for rearing
- Environmental sustainability depends on the identification of underutilized, ecologically uncritical side streams as feed substrates
- Innovation capacities, esp. of the most vulnerable need to be developed

Outlook

- Four different species have been selected for rearing & feeding trials
- Value chain development with govt. and non-govt. stakeholders
- Integration of insects as food into existing policies, plans and programs for upscaling

Objectives

- To develop a multidimensional framework to assess the context specific potentials of insects as food for nutrition
- To inform adaptations and thereby enhance the sustainability of insect rearing systems and value chains
- To apply and test the assessment framework on the case study area

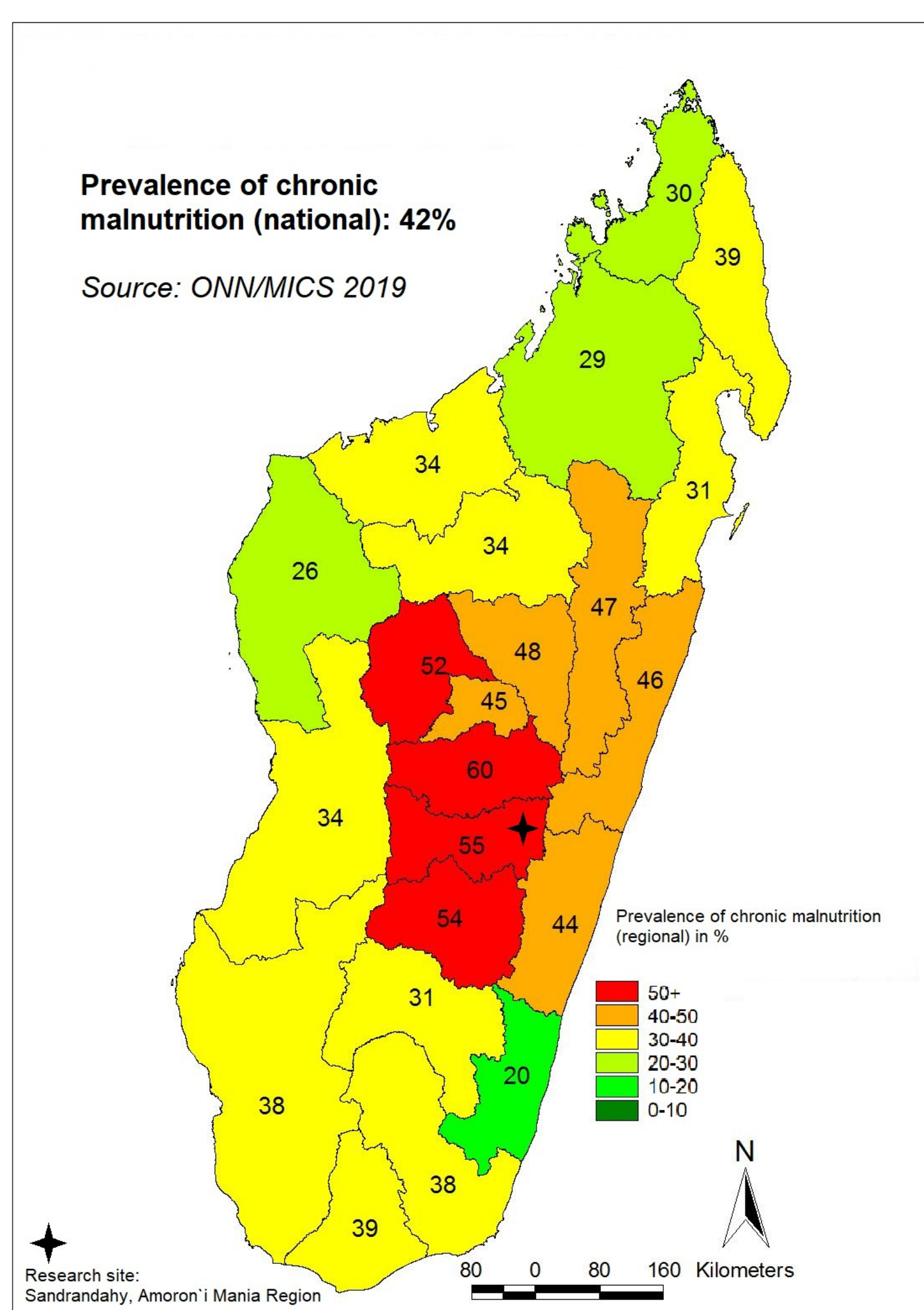


Fig.1: National monitoring map of ONN (National Nutrition Office)

TROPEN TAG KASSEL 2019, 18 – 20 SEPTEMBER