Seasonal dynamics in diet across eco-zones of Madagascar

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E2M2: Epidemiological and Ecological Modeling in Madagascar 2019

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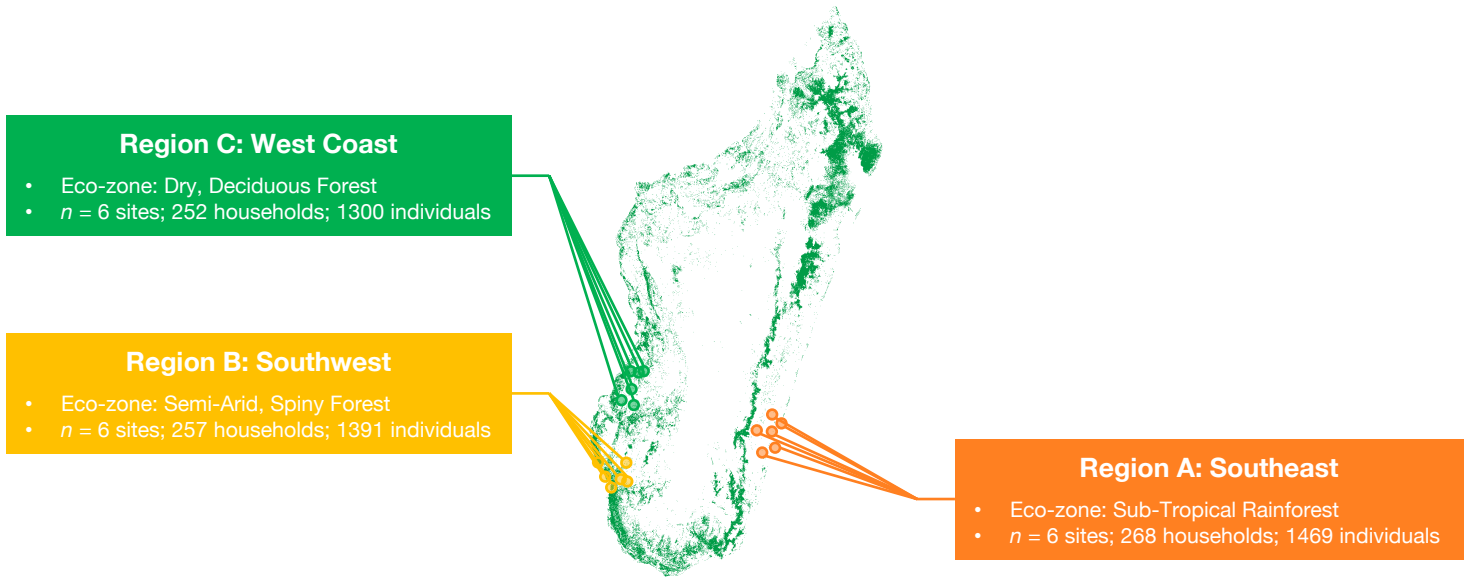
BACKGROUND

Background: The Harvard-Fararano research project have made fieldwork across 3 ecological zones of Madagascar for longitudinal dietary, food security and human Health since 2017

Statistical model: What are the staple foods of Malagasy populations that can consume seasonally?

Dynamics model: How does rice availability influence dynamics of food security?

Figure 1: Sampling across eco-zones of Madagascar



Objectives:

To provides the most precise information on diet intake

Study at all zones during the same seasons and permit more direct comparisons between regions

Relative contributions to regionally and seasonally available food

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STATISTICAL MODEL

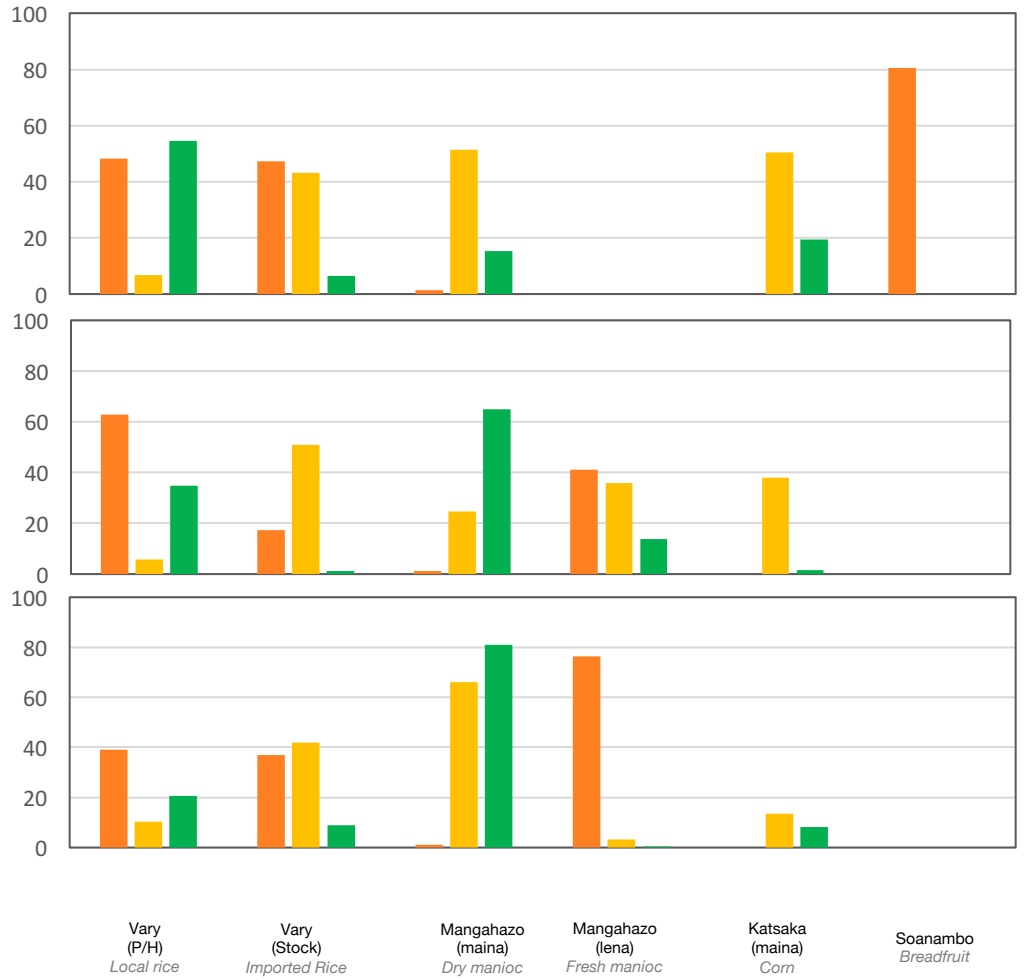
Statistical model:

Rice is a staple food in Madagascar. Corn, Manioc and Bread Fruit are also eaten.

Rice is served with fish, chicken, meat and vegetables. Sauces are prepared using ingredients such as hot peppers, mangoes and lemon juice. Coconut milk is sometimes used in cooking.

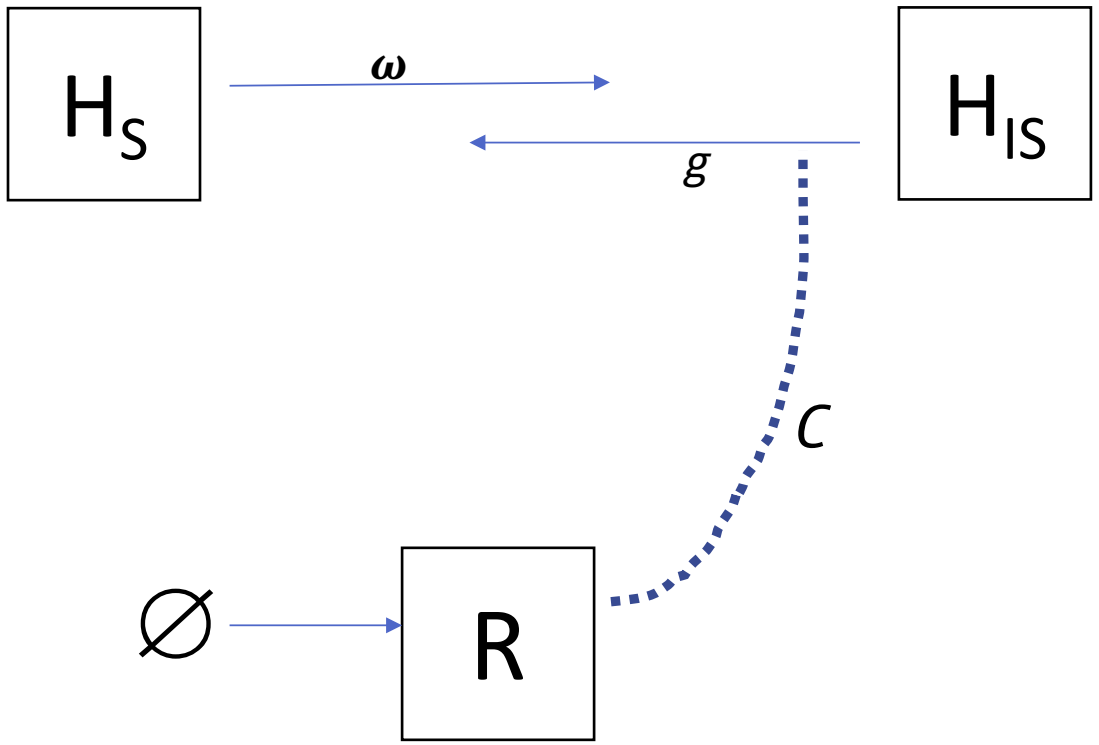
Vegetables available include beans, carrots, cabbages, potatoes and a variety of greens.

Figure 2: Seasonal changes in most common foods (24 hour recall surveys, *n* = 777 households)



DYNAMICAL MODEL

Dynamical model:



$$\frac{dH_S}{dt} = -\omega HS + gCRHI_S$$

$$\frac{dH_{IS}}{dt} = \omega HS - gHISCR$$

$$\frac{dR}{dt} = \emptyset R - RC$$

H_S: Individuals (food secure)
H_{IS}: Individuals (food insecure)
R: Rice availability

C: Rice consumption
∅: Seasonal Rice growth
ω: Stress (food shortage)
g: Access (food sufficiency)

- Theoretical and Methodological Considerations in the Design of Food Security
- General Overview on Food Access in Madagascar
- Influence of food security on human health
- Resources Available for Food Security Interventions