Thesis project

Ecological approaches for managing rodent communities and their socio-economic and health impacts in Niamey City urban areas

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Context

❑ Rondents

- **Most diverse of mammals (42%)**
- **Cosmopolitan** and very prolific
- **Close to humans**




Socio-economic and health issues

Slums (Favorable environment)

- **High human density**
- **Precarious Constructions**
- **High Abundance of species :**
  - ✓ **predation is low**
  - ✓ **resources are permanent an easily accessible**

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❑ Rodent control (current)

- use of poisons
- use of traps
- domestic cats

based on individual efforts ➔ *Persistence of the problems*

Discussion with leaders and members of Gamkalley community.

Alternative

Towards the need for integrated control (ecological control)

Community-based

Study Objectives

❑ Principal

Establish a coordinated fight Bio-ecology and environmental and socio-economic contexts To limit rodent impacts

❑ Specific

OS1 : Studying rodent abundance and diversity at Gamkalley ;

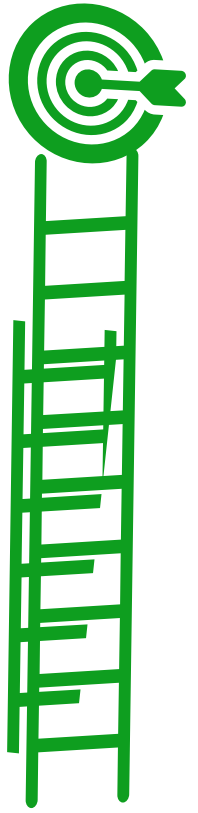
OS2 : Studying rodent mobility with rhodamine B ;

OS3 : KAP Survey (Gamkalley) ;

OS4 : Map landscapes taking into account (OS1+OS2+OS3)

OS5 : Assess damage caused by rodent ;

OS6 : Detect and identify circulating pathogens



Research questions

1. What are the ecological characteristics and parameters of rodents in Gamkalley ?
2. What are the landscape elements and the links with rodent distribution and mobility?
3. What are the residents' knowledge, attitudes and perceptions (KAP) of rodents, rodent-related nuisances and rodent control?
4. What are the losses (damage estimates) and zoonotic risks associated with rodents?

Sudy site : Gamkalley

Neighborhood belonging to the 4th district of the city of Niamey

<u>It is an informal urban space</u>
Banco, limited roads, access to water and electricity problematic lack of waste management system

Sudy site : Gamkalley

Golley : Residential area approximately 2.14 km
Surrounded by indistrual area, gardens and abatoire

Site tracked by Garba (2012) ➔ Diversity and certain ecological traits

Deputy Chief of Gamkalleye community Mr. Oumarou Garba.

*'…. **I think these animals are serious problems to our community and we need to do something about it**…. There were instances where I lost money in my home and ended up finding it in rodent burrows after some time.'*

Université Abdou Moumouni de Niamey

THESE
Pour obtenir le grade de docteur de l'Université Abdou Moumouni
Spécialité : Génétique et Biologie Moléculaire

Présentée et soutenue publiquement par

Madougou GARBA

le vendredi 21 décembre 2012

Rongeurs urbains et invasion biologique dans le sud ouest du Niger : écologie des communautés et génétique des populations

Methodology

Axis 1 Spatial and temporal abundance of rodents

- **Capture for one year**

Wire mesh & Sherman

Sébanguey = 20 Houses

B

Golley = 40 Houses

A

B

Four sessions to cover all seasons

➔ 3 Nights per session

- **Specific identification of captured individuals**

Session 1 ➔ Site A

564 NP = 63

r(%) = 11,17

Axis 2 Rodent mobility with rhodamine B

stage **1: Tests in the pet store for the dose capable of recovery.**

Stage **2: Exposure of Rhodamine B on some points of the study site**

Stage **3: Trapping 3 weeks after**

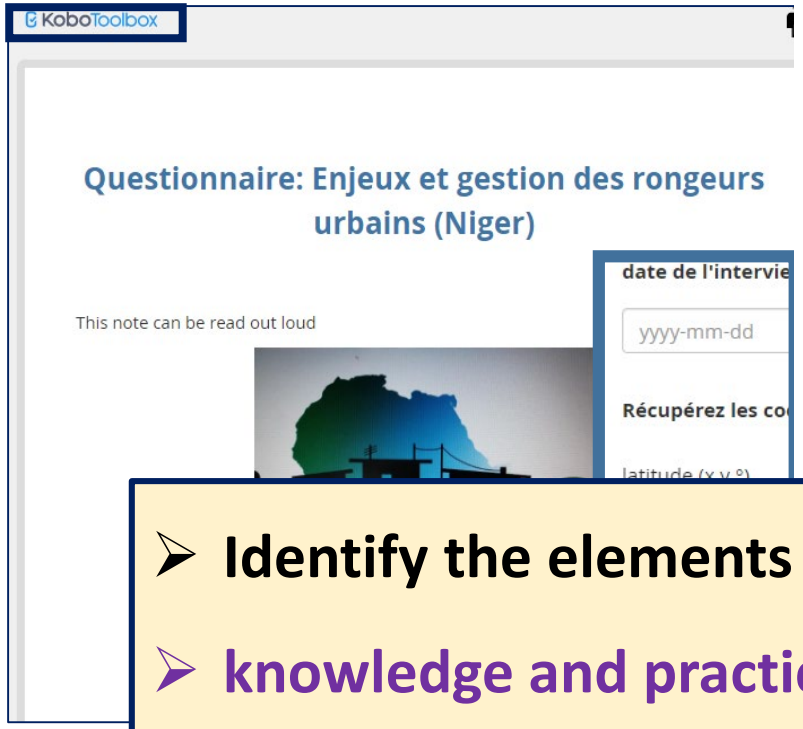
Stage **4: Hair collection and blade preparation**

Stage **5: Fluorescence Microscope Reading (CERMES/CBGP??)**

Axis 3 KAP Survey (Gamkalley)

Individual survey and group focus

based on a KAP questionnaire specifically adapted to urban contexts



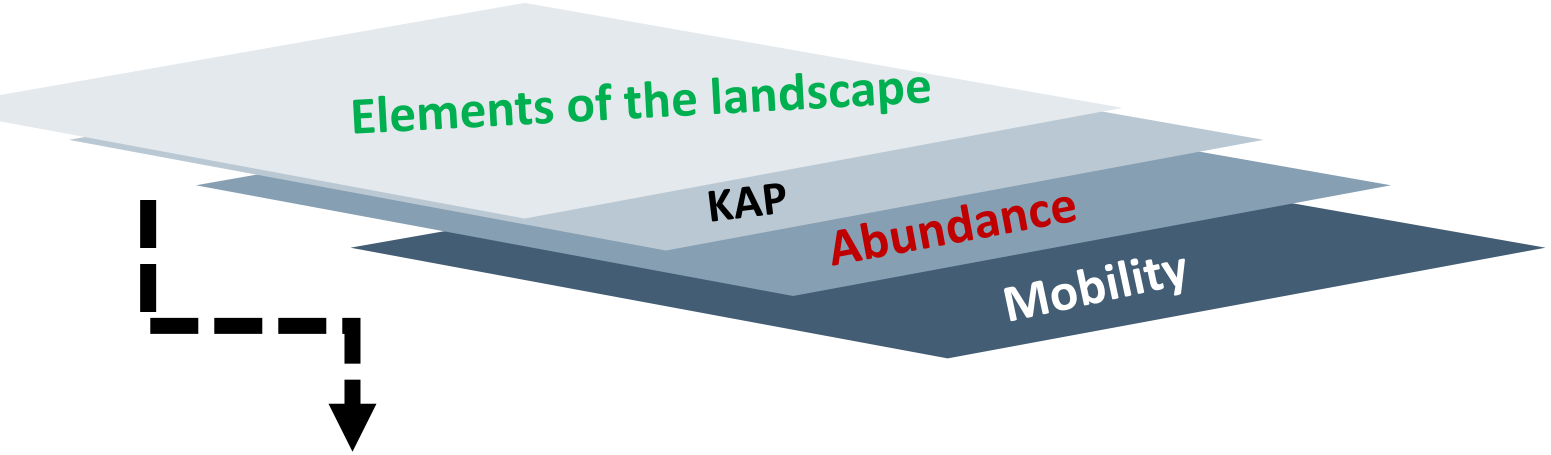
- Informationssur l'enquêteur
- Part 1: Informations générales sur le répondant, ménage ou son lieu de travail
- Part 2: Le ménage ou site de travail
- Partie 3 : Nuisibles et rongeurs
- Partie 4 : et dégâts associés aux rongeurs

- ➢ **Identify the elements of the landscape,**
- ➢ **knowledge and practices of the residents (rodents and control),**
- ➢ **Describe the types and nature of damage**
- ➢ **Detect the associated health risks**

➢ **Facilitate EBRM**

Axis 4 Cartographie du paysage

Participatory mapping (coll. *SCARIA & Open Street Map Niger*)



Spatial analyses of the landscape/rodent ecology association

ex. impact of the landscape on rodent mobility and abundance.

Axis 5 Assess rodent damage

❑ Quantify losses

In site

Losses due to collective action of rodents

Tracking 126 bags in 30 houses 9 months. 30Kg cereal/bag

Protocol 1 (24 houses) = 4 bags/house (same type)

Protocol 2 (6 houses) = 5 different bags/house

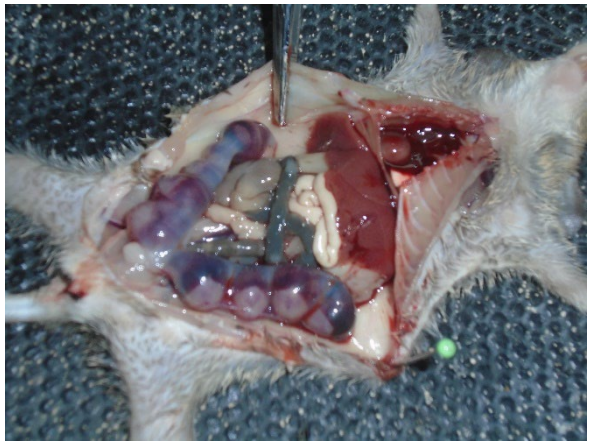
According to Y. Meheretu, adapted from a protocol put in place by Ethiopian colleagues in the SCARIA project

In rattery

Estimate how much an individual can consume in a given time unit.

Axe 6 Pathogene detection

Sample of analyses



Blood: rodents + human (coll. *SCARIA,* CERMES)

Rodent Organs: Spleen, Kidney & both ears

Interest pathogens

Virus: *Lassa & Hanta*

Bacteria: *Leptospires*

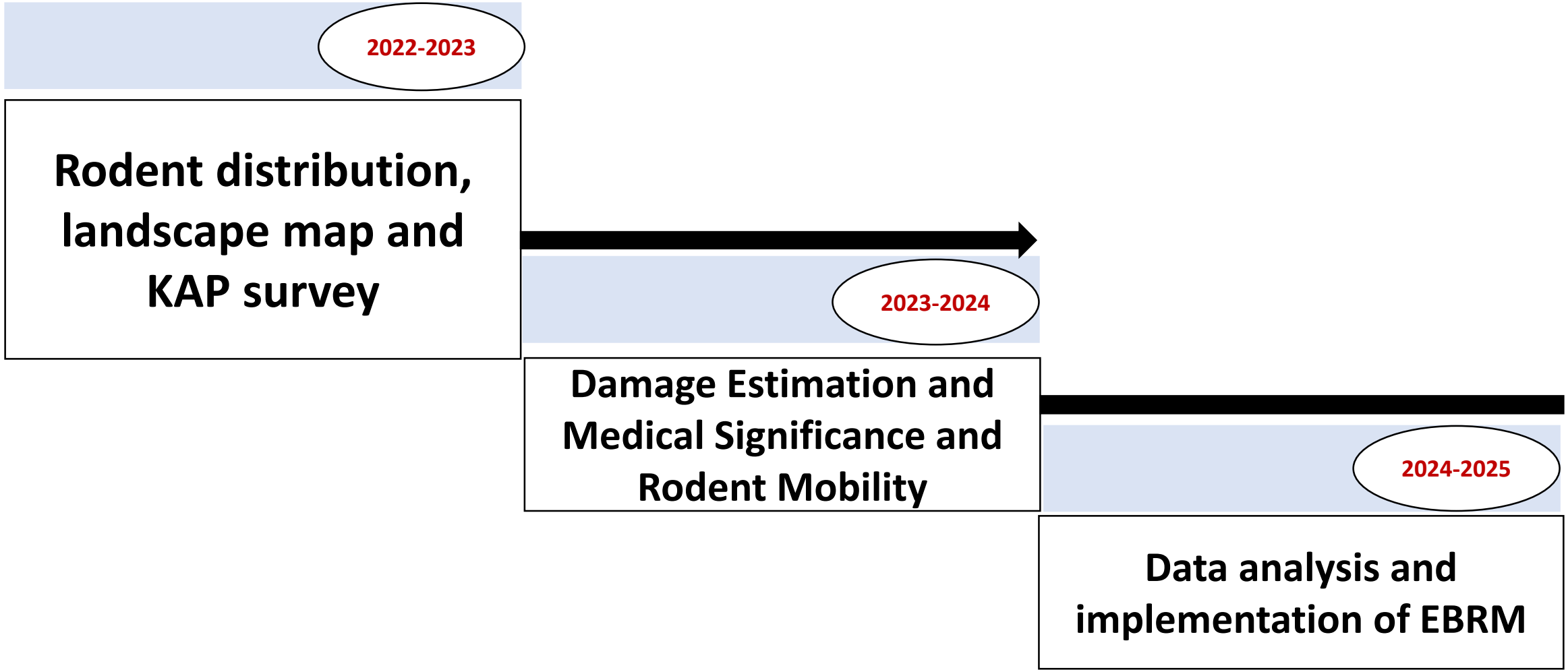
CERMES & CBGP

Type of analysis

Serologic

Molecular **(qPCR)**

Chronogram of activities



Thank you for your attention