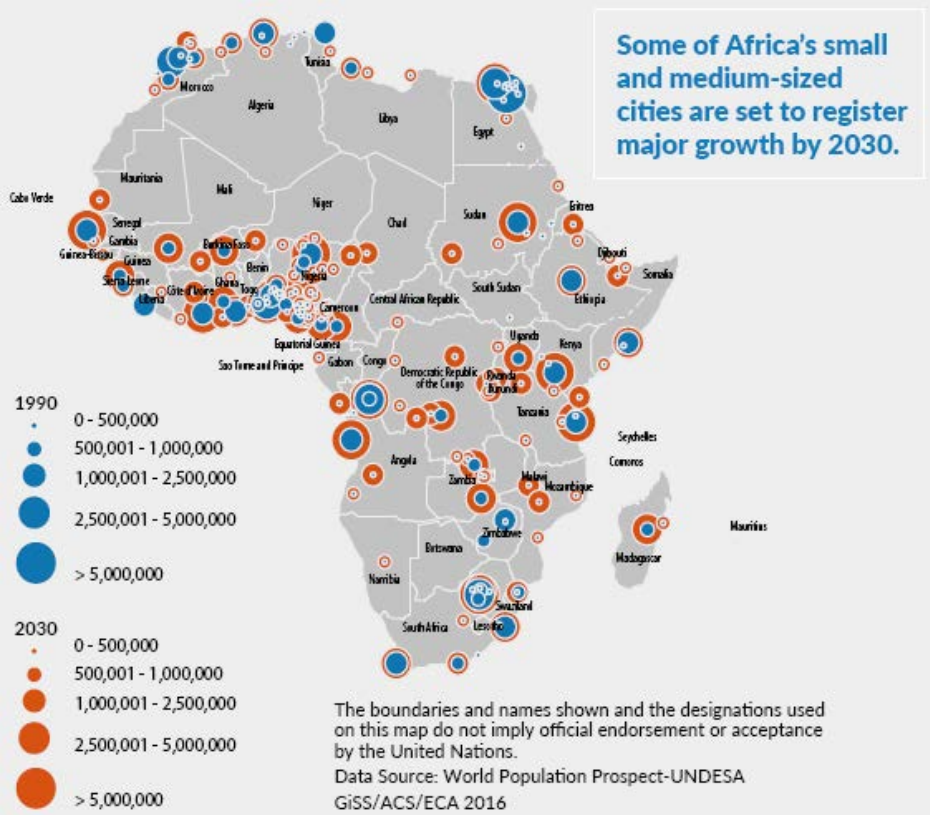
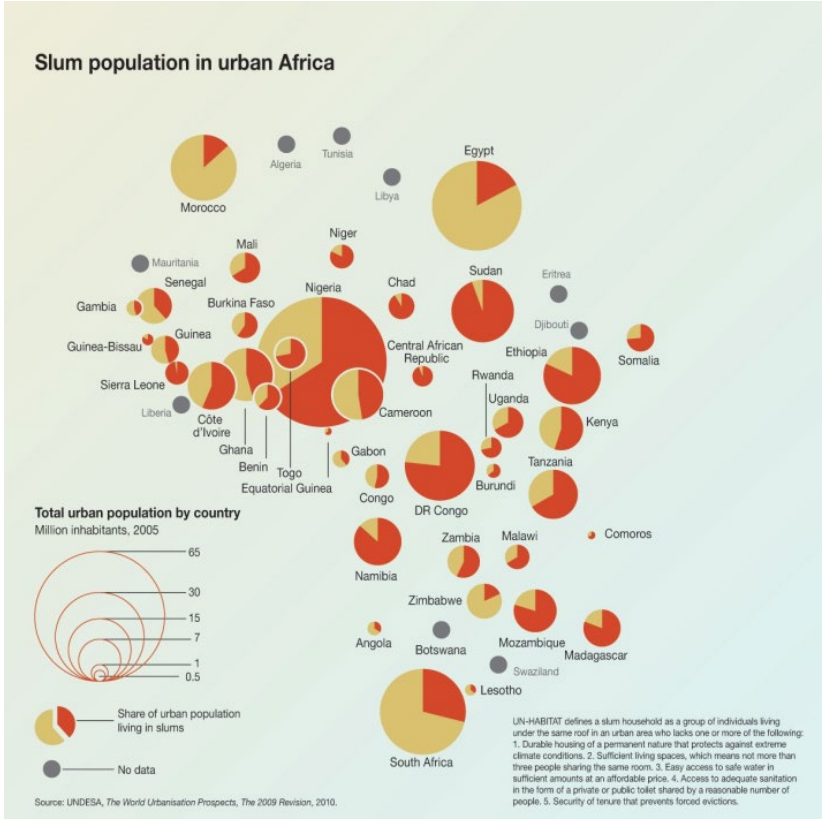
Urban EBRM

Specific challenges, ongoing attempts and first results / feelings

A focus on informal settlements – e.g. Africa

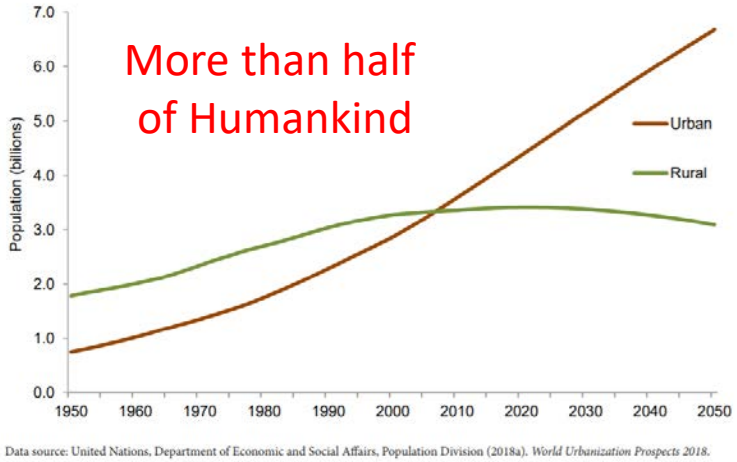




Urban population in Africa from 400 million in 2010, to 1.2 billion in 2050
In the 2020s, around 2/3 of African dwellers live in slums

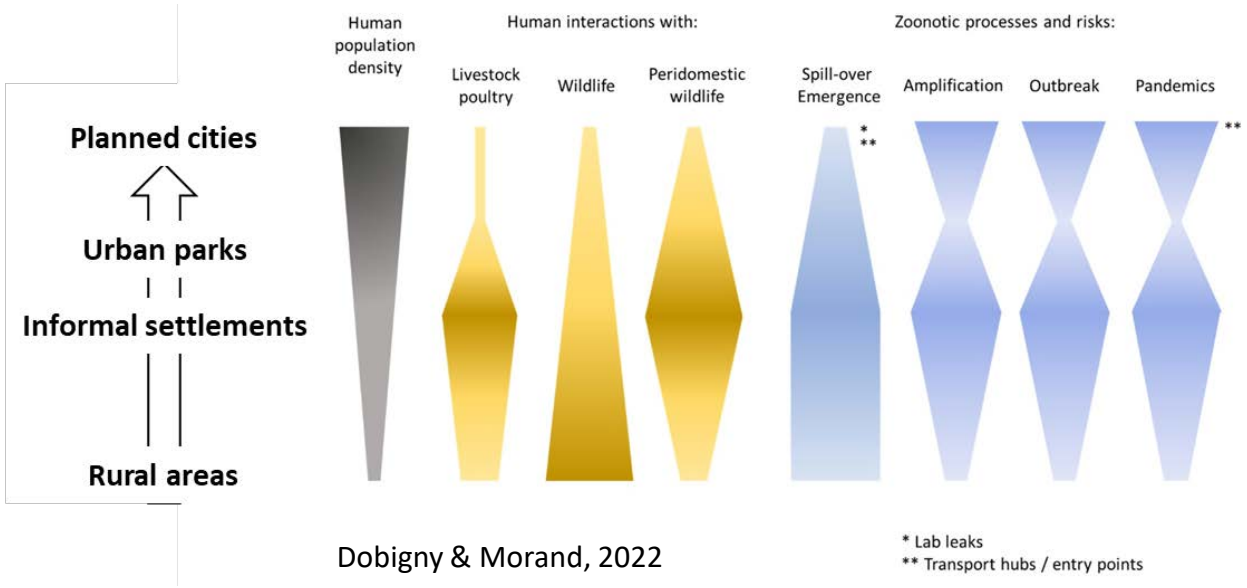
NB: Decreasing percentage of slum inhabitants, but increasing number of people!

Urban (informal) environment: which challenges?



Data source: United Nations, Department of Economic and Social Affairs, Population Division (2018a). *World Urbanization Prospects 2018.*

Highly degraded socio-environmental conditions



Dobigny & Morand, 2022

* Lab leaks
** Transport hubs / entry points

Billions of animal/human interactions,
hence zoonotic spill-over opportunities

Urban EBRM: which specific features?

Many humans, many resources

- food stocks and remains
- rubbish
- nooks
- Tight promiscuity with bred/domestic animals

Lodge and boarding for rodents

Urban EBRM: which specific features?

Coexistence of multiple human groups
- history
- migrations, turn-over
- cohesion potentially weak

May be tricky to identify sociological entities to target, hence resource persons

May be required to rely on several languages

Multiple coexisting habits, customs and beliefs to understand and to take into account

Potentially various challenging antagonisms and rivalries

Urban EBRM: which specific features?

Rodents as everyday nuisances (e.g., damages on infrastructures, stuff, clothes, etc) but not always as pests for food stock

Many other issues to face: rodents probably far from a priority

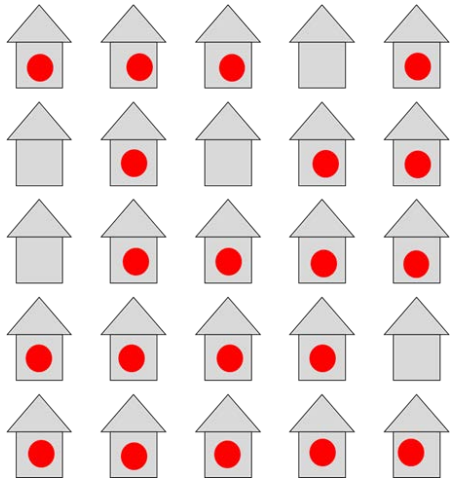
Rodent-associated health issues poorly known

Inhabitants less prone to enroll in EBRM actions than crop producers

Raising awareness on health and socio-economic issues?

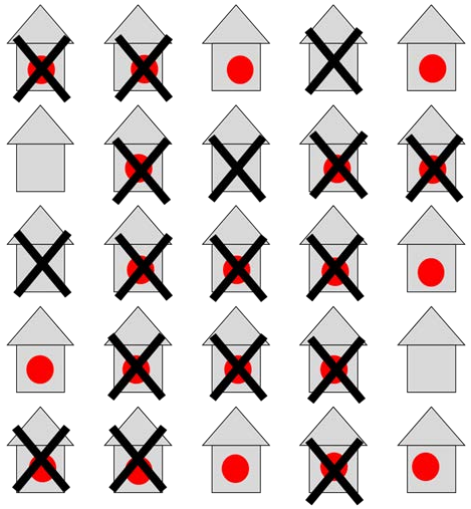
Urban EBRM: which specific features?

High rodent infestation in households



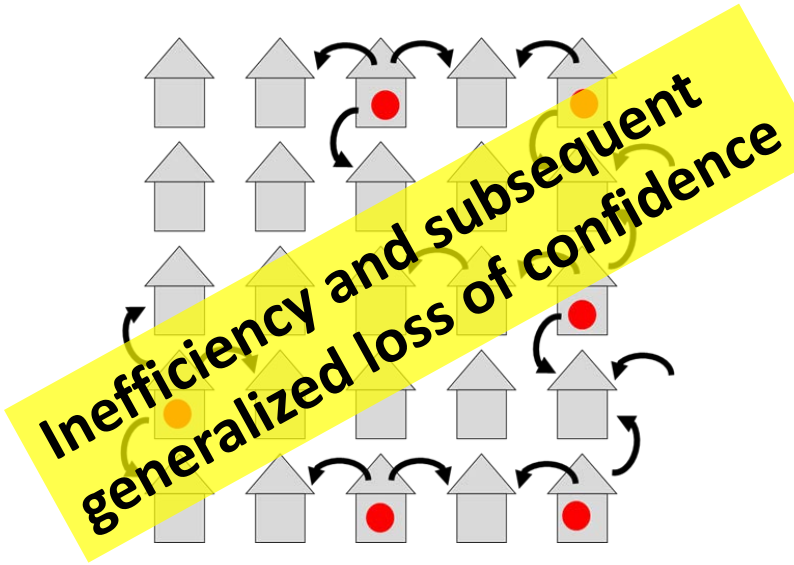
Presence of rodents

Rat control in some households only



Confidence and rat control

Rapid recolonization from non-deratted houses



Recolonisation

More chances to have gaps in rat control devices

SCARIA

TOWARDS SUSTAINABLE COMMUNITY-BASED MITIGATION OF RODENTS ASSOCIATED ISSUES

Towards sustainable community-based mitigation of sanitary and socio-economic burden of urban rodents in African cities

Two targets

(1) Local multi-stakeholder working groups on urban EBRM

(2) Baseline knowledge on rodents and associated issues in the pilot sites

… in order to be able to apply to a coming call (e.g. BF2, FID) to implement and to evaluate the co-constructed EBRM

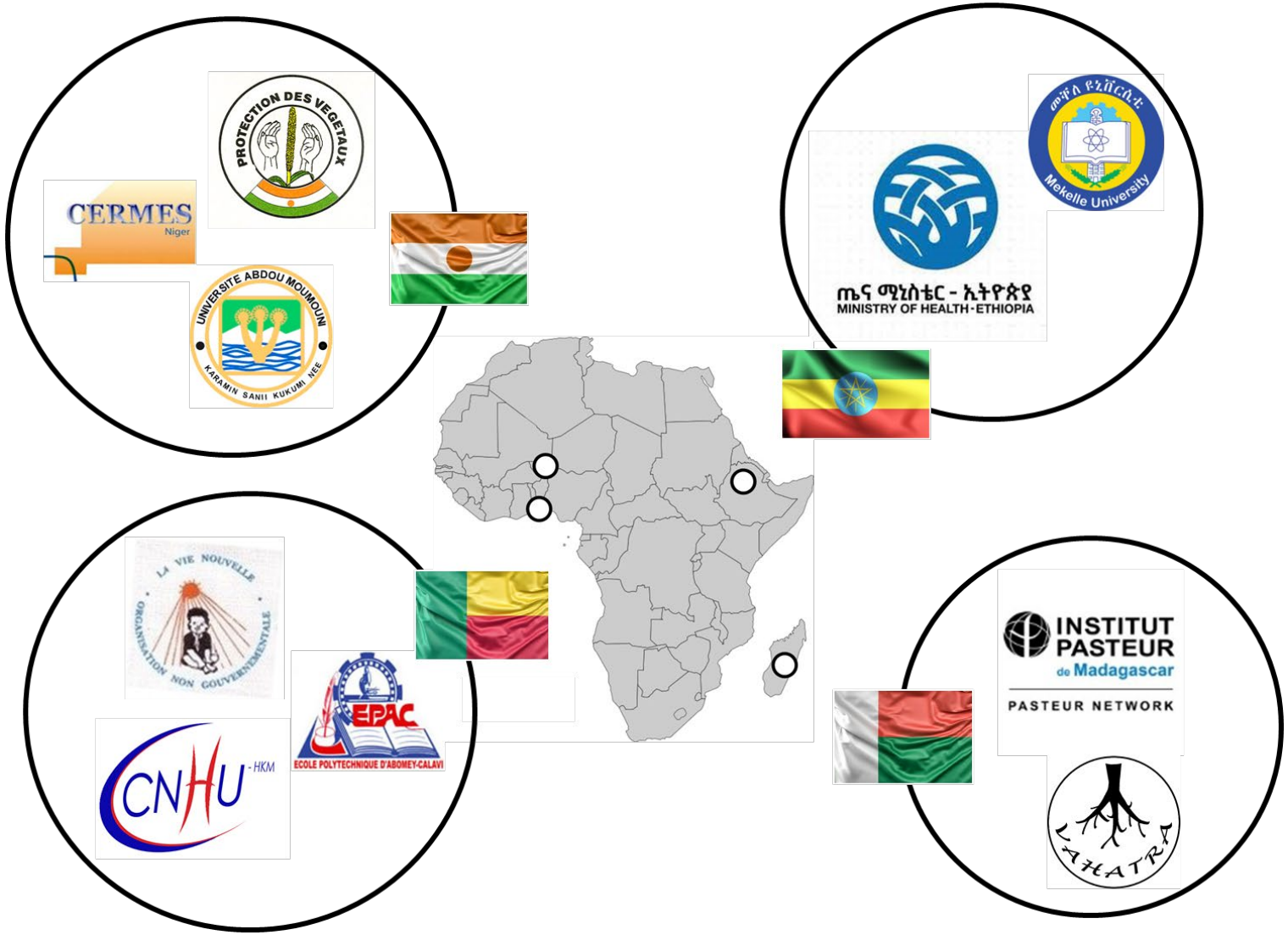
- **To forge links with local communities/environments**
- **To set-up urban observatories of humans/rodents/socio-environments**

A wide panel of academic and non-academic partners in four Afro-malagasy countries

CBGP
Centre de Biologie pour la Gestion des Populations

META
META

Open Street Map



Ankasina, Antananarivo, Madagascar

Emblematic of Tana’s urban margins
Floodable
Omnipresence of rubbish
Precarious habitats

Ankasina, Antananarivo, Madagascar

June 2022:	130 small mammal samples 100 human samples 100 KAP (non standardized) surveys
Oct-Nov 2022:	147 small mammal samples
Dec. 2022:	Standardized KAP surveys Human sampling
Feb. 2023:	New small mammal samples + investigation of SEOV + rhodamin-based study + free fleas sampling
June 2023:	Same + helminths?
2024:	Preliminary EBRM tests, taking advantage of the « islands » configuration?

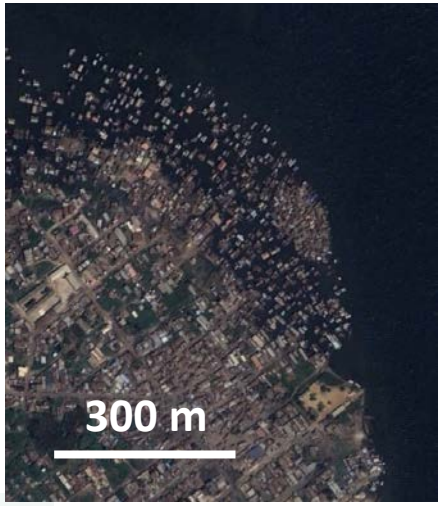
Plague, leptospirosis and typhus circulating among small mammals

Human leptospirosis
+ previous confirmed human cases of plague
NB: typhus not tested yet

KAP → ????????

Ladji, Cotonou, Bénin

Emblematic of Lake Nokoué shores
Semi-lacustrian and partly floodable zone
Omnipresence of rubbish (including embankment)
Precarious habitats



Ladji, Cotonou, Bénin

2016-2018 and April 2021:	345 small mammal samples
2016-2022:	Landscape analyses of rodent-borne leptospires
2018:	Investigation of human leptospirosis cases within Cotonou
Feb. 2020:	62 domestic animals sampled and investigated for leptospirosis
2022:	KAP surveys of 208 individuals and 10 focus groups conducted
2022-2023:	Human sampling ready but awaiting for ethical agreement
2023:	Serological investigation of SEOV in rats + economic quantification of rodent-associated damages

Rattus norvegicus, *R. rattus*, *M. natalensis* and *Crocidura olivieri*

Detection of *Toxoplasma gondii*, *Trypanosoma lewisi*, *Bartonella* spp., *Mycoplasma* spp., *Ehrlichia* spp., (antibiotic-multiresistant) Enterobacteria…

ca. 12% rodent-borne *Leptospira* prevalence
Important spatio-temporal variations
High *Leptospira* genetic diversity, with several coexisting genotypes/serovars

Leptospires also detected in cattle, sheep and goats (16%) as well as in standing waters

One human *Leptospira*-seropositive case

Gamkalleye, Niamey, Niger

Ancient (historic) and initially central district
Dense, close and arid area
Precarious « banco » -made habitats

Gamkalleye, Niamey, Niger

2010-2014 A few dozens of small mammal samples

2013: Niamey-wide survey of inhabitants' perception of rodent-associated issues

2022 onwards: Aziz Danzabarma's PhD Thesis – a new start: KAP, rodent and human sampling in progress

Urban Ecosyst (2014) 17:573–584
DOI 10.1007/s11252-013-0336-x

Local perception of rodent-associated problems in Sahelian urban areas: a survey in Niamey, Niger

Madougou Garba · Mamadou Kane · Sama Gagare · Ibrahima Kadaoure · Ramatou Sidikou · Jean-Pierre Rossi · Gauthier Dobigny

M. natalensis, R. rattus and *Crocidura olivieri*

Low investigation of rodent-borne pathogens
(but Aziz has now taken the scene!)

Detection of *Trypanosoma lewisi*
(NB: No *Toxoplasma gondii*, no *Leptospira* spp. – 2011-2012 surveys)

Towards co-construction

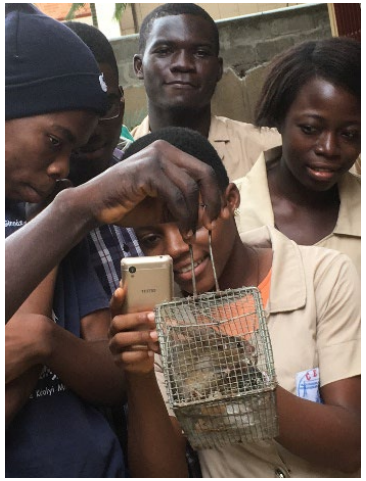
Tight links with local NGO / medico-social centers

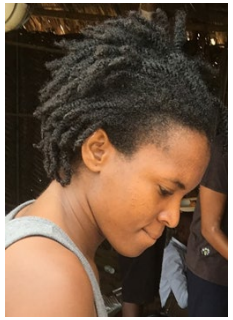
(Public) meetings

Participative mapping

KAP surveys

Junior Scientific Club(s) (included in SCARIA)





Locally trained and contracted inhabitants

First data/results

Lots of small mammals – native (Niamey and Cotonou) and/or invasive (all three) ones

Human pathogens in small mammals
e.g., lepto in Cotonou and Tana, plague & typhus in Tana

Generalized complaints about rodents
e.g., foodstocks, furnitures, houses, noise, etc) – but rare mentions of health issues

→ Legitimate and favourable context for rodent control

→ Importance of communication and awareness raising

Many testimonies of **rodent-associated damages** in all sites

EBRM: which opportunities? Next steps?

Context-specific characteristics + country-specific partnerships history

→ context-specific way of driving research and EBRM co-construction

Context-specific types of leverages/opportunities

e.g., foodstocks (Niamey, Cotonou vs. Tana)

domestic animals (Tana > Niamey > Cotonou)

collective organization (e.g., local groupings in Ladji and Niamey, etc)

local « rules » (e.g., *dina* in Tana)

Interesting testimonies of **increased awareness** in Cotonou

KAP surveys in Cotonou and Tana suggest **opportunities for collective actions**

2023: formal setup of local pluri-stakeholders EBRM groups (+ first attempts in Tana)

Thank you – questions?