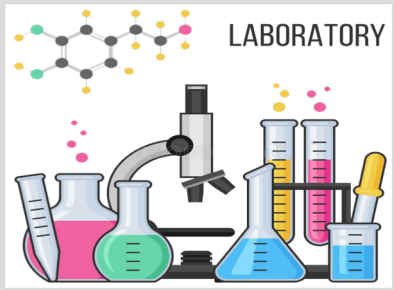
Low-Cost, Low-Infrastructure Reproductive Platform to Nurture Ethiopian Sheep and Goat Breeding Schemes

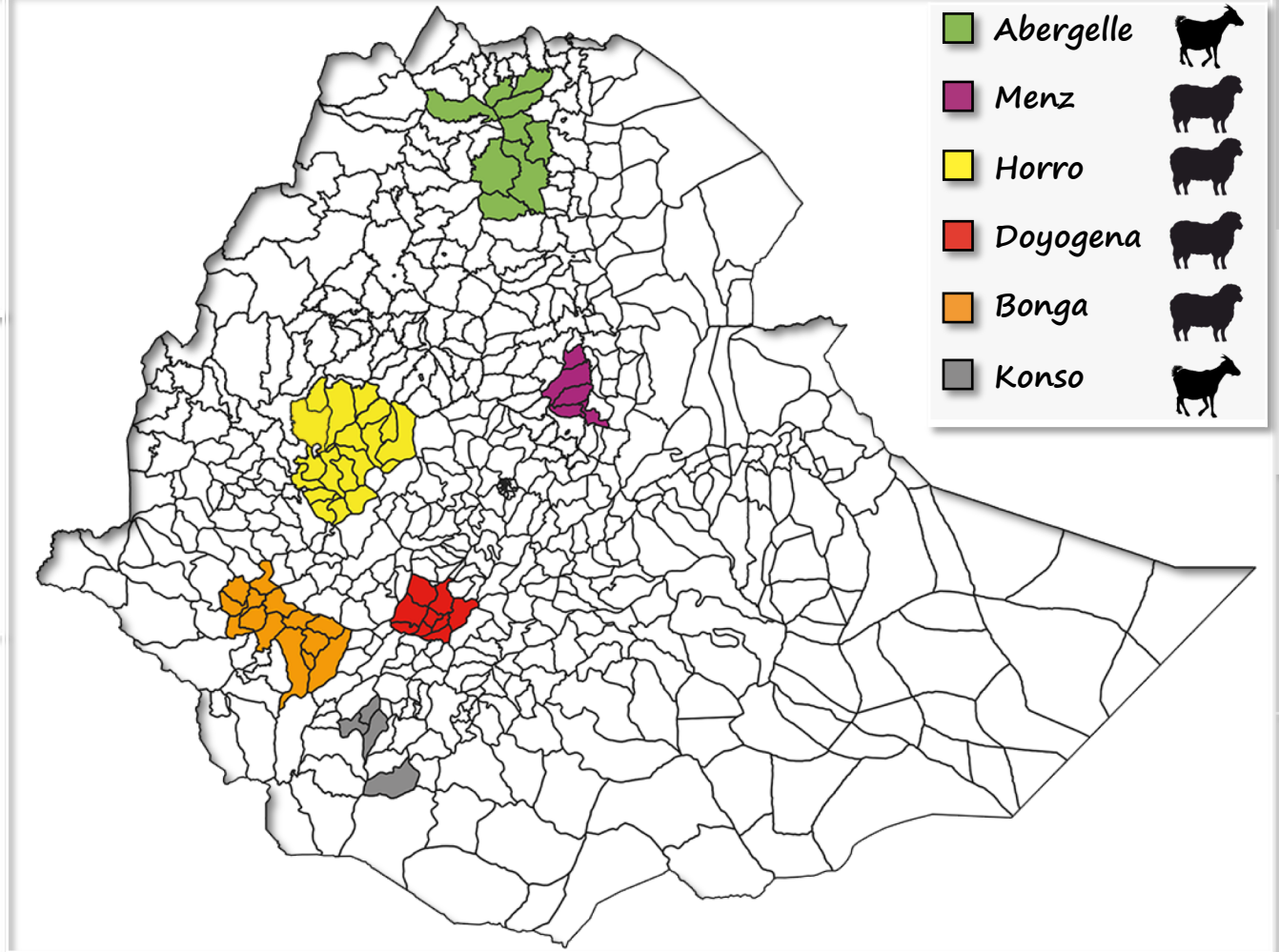
ICARDA
Science for resilient livelihoods in dry areas

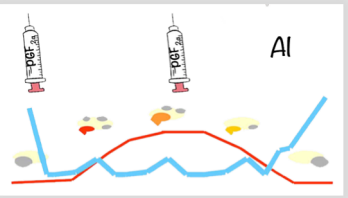
ILRI
INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

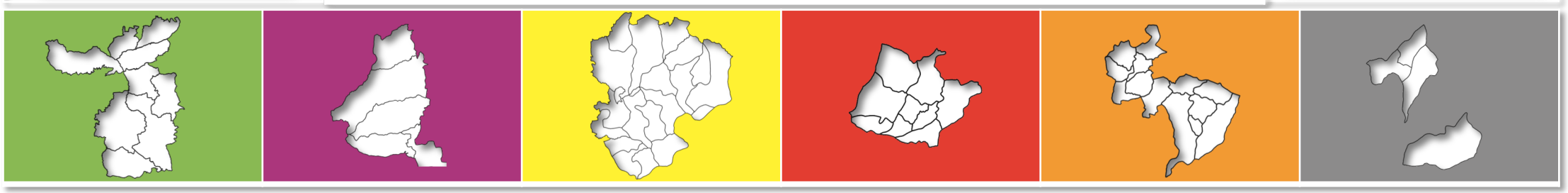
CGIAR
Science for a food secure future

IFAD
INTERNATIONAL FUND FOR AGRICULTURAL DEVELOPMENT









SHOTS in Ethiopia

source of income

socioeconomic and cultural functions

food

means of risk mitigation during crop failures

raw materials

high lamb mortality

low growth rates

poor nutritional status: infertility and long lambing intervals

Productivity

disease prevalence

Back

Community-based breeding programs (CBBP)

New suggested approach as an alternative to the conventional centrally managed and top-down breeding programs (Haile et al., 2019; Mueller et al., 2015).

Programs that adopt this strategy take into account farmers' needs, views, decisions, and active participation, from inception to implementation.

CBBP's have now reached a stage of maturity and are being adopted by Ethiopia government as the main strategy for genetic improvement (+)

1. Establishing new CBBP's in new villages of the different project target areas
2. Expanding the number of household members in current CBBP's
3. Reproductive platform for the delivery of improved genetics

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Improved sires certification

Community-based selection of improved rams and bucks

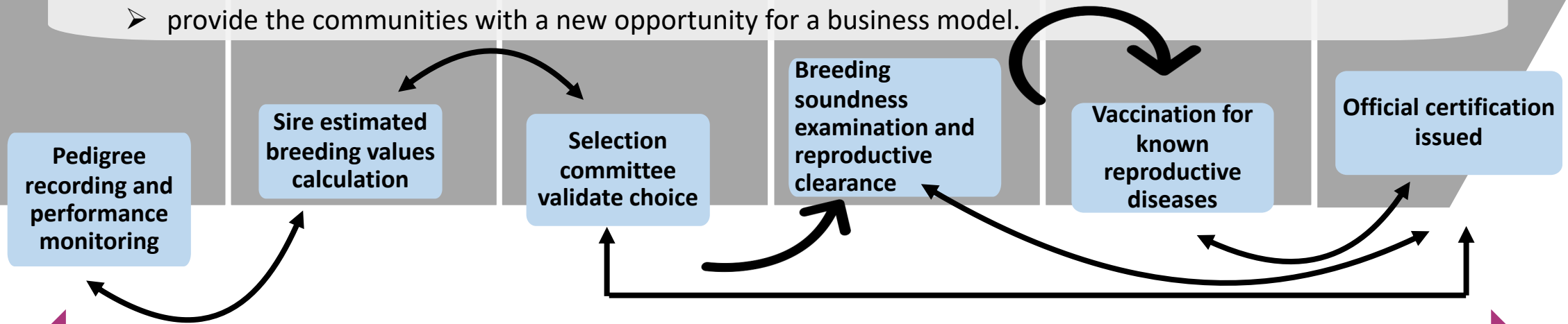
Excellency in establishing a national stud of rams and bucks

Ministry of Agriculture, NAGI, ICARDA, ILRI

The quality and the value of selected sires are the backbone of breeding programs. Emerging breeding programs are hindered and can prematurely vanish when farmers cannot access high quality males with adequate breeding, reproductive and health standards

Establish a certification process both technical and institutional that would:

- contribute to the transformation of Sheep and Goat breeding programs in Ethiopia,
- reduce the risk of potentially unsuitable rams being used for breeding,
- provide the communities with a new opportunity for a business model.



Birth 6 months 9 months 10 months 10 months 12 months

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Service delivery of ultrasound pregnancy diagnosis

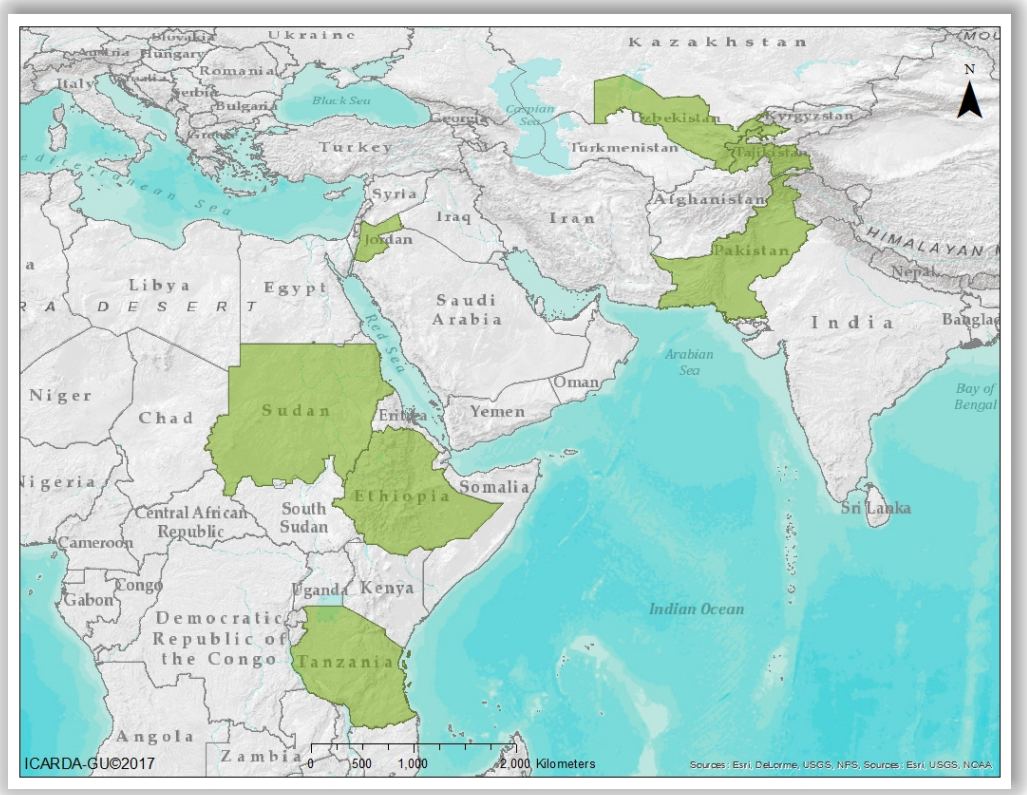
Check on females with recent reproductive pathologies

Culling of Sterile Animals

Screening for pregnant females

Discard pregnant females prior to synchronization and AI

Ultrasound Pregnancy Diagnosis



Calculation of the age of the fetuses

Check on repeat breeders

Screening for litter size

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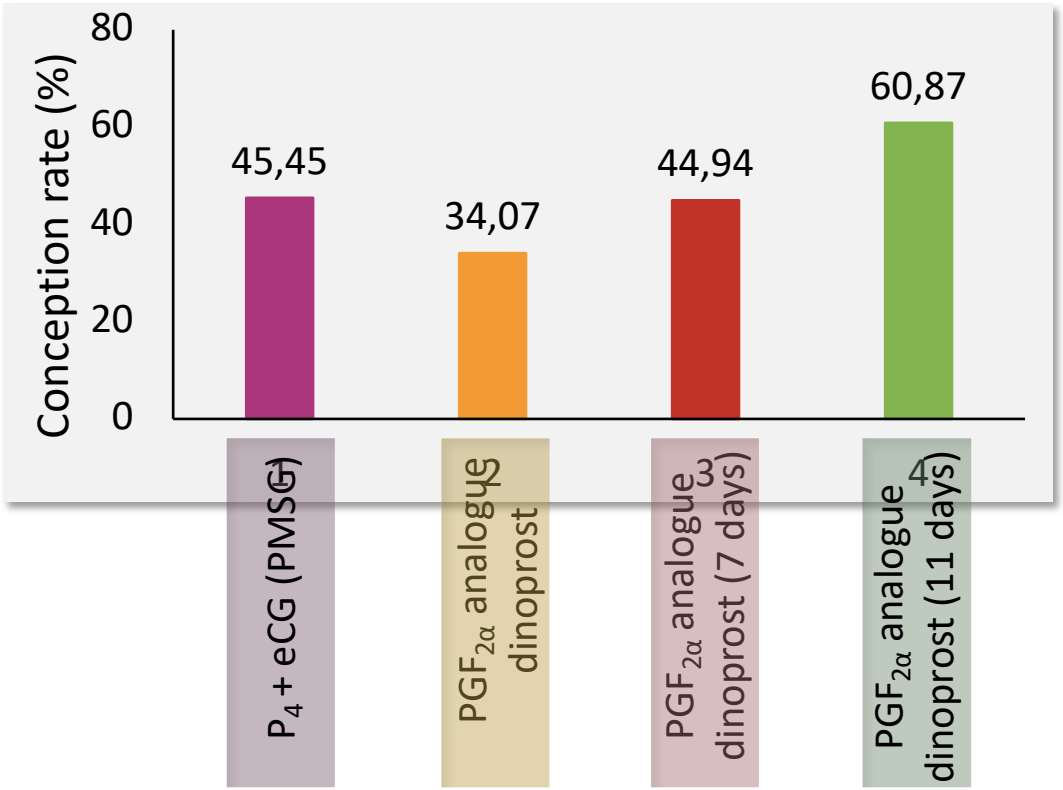
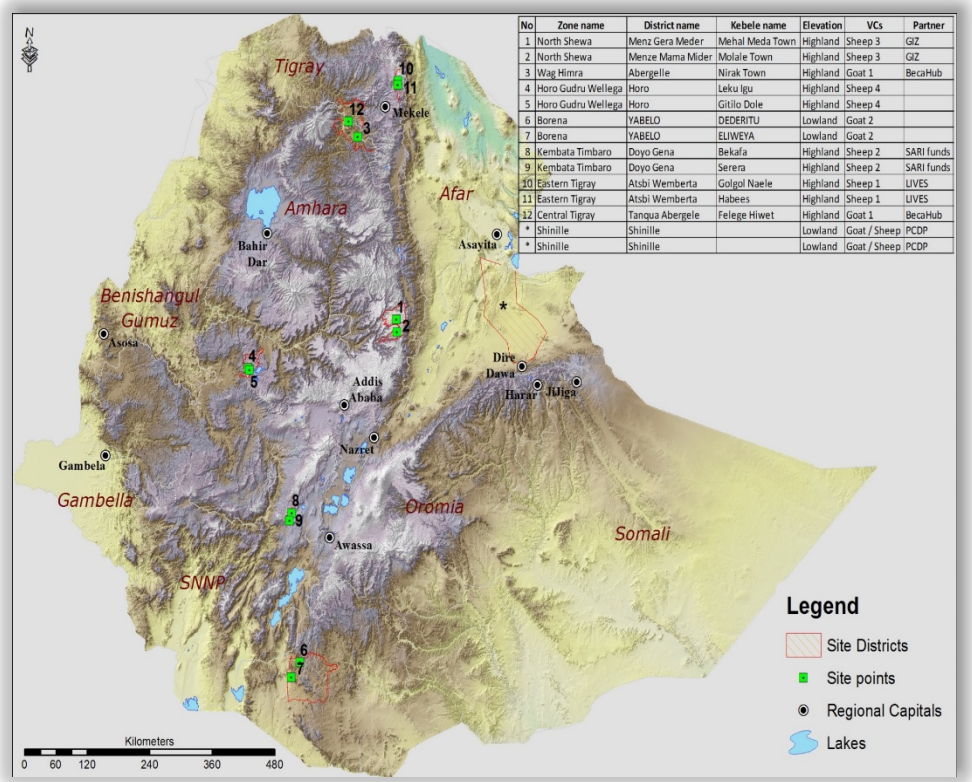
Oestrus synchronization

Using a simple protocol of 2 injections of a prostaglandin analogue (Enzaprost) 11 days apart:

- Increases fertility up to 89% in natural mating and up to 60.8% in IA
- Allows fixed time artificial insemination,
- Saves on the cost: US$ 1.3 vs. US$ 8.5 for the conventional protocol,
- Locally available products to support delivery system.





No	Zone name	District name	Kebele name	Elevation	VCs	Partner
1	North Shewa	Menz Gera Meder	Mehal Meda Town	Highland	Sheep 3	GIZ
2	North Shewa	Menze Mama Mider	Molale Town	Highland	Sheep 3	GIZ
3	Wag Himra	Abergelle	Nirak Town	Highland	Goat 1	BecaHub
4	Horo Gudru Wellega	Horo	Leku Igu	Highland	Sheep 4	
5	Horo Gudru Wellega	Horo	Gitilo Dole	Highland	Sheep 4	
6	Borena	YABELO	DEDERITU	Lowland	Goat 2	
7	Borena	YABELO	ELIWEYA	Lowland	Goat 2	
8	Kembata Timbaro	Doyo Gena	Bekafa	Highland	Sheep 2	SARI funds
9	Kembata Timbaro	Doyo Gena	Serera	Highland	Sheep 2	SARI funds
10	Eastern Tigray	Atsbi Wemberta	Golgol Naele	Highland	Sheep 1	LIVES
11	Eastern Tigray	Atsbi Wemberta	Habees	Highland	Sheep 1	LIVES
12	Central Tigray	Tanqua Abergele	Felege Hiwet	Highland	Goat 1	BecaHub
*	Shinille	Shinille		Lowland	Goat / Sheep	PCDP
*	Shinille	Shinille		Lowland	Goat / Sheep	PCDP

Artificial insemination

Field semen assessment and processing

- Collect, assess and process semen at 35 – 37 ˚C;
- Prepare straws and store at 35 – 37 ˚C;
- Use straws within 20 min of preparation;

- Dilute semen in extenders warmed at 35 – 37 ˚C;
- Use ejaculates with a mass motility > 3 – 3.5; (surging rapid waves) and a concentration > 3.5 10^9 spz/ml;
- Calculate number of straws and volume of extender to add so that every straw with a 0.25 ml contains a minimum of 200 10^6 spz/straw.

Cervical insemination

- Inseminate the ewes in the upright position;
- Most ewes should present mucus discharges in the vagina and this is a good sign;
- Do not inseminate ewes with clear signs of vaginal irritation and pus;
- Deposit semen at the entrance of the cervix; do not push the insemination gun deep into the cervix rings (permanent damage of the cervix and sterility);
- Gently down release the ewe after insemination.

Post-insemination management

- Inseminated ewes should remain isolated from community rams;
- Reintroduce rams 10 days after insemination to ensure return estrus and guarantee flock fertility;
- No sharp change in the diet during the 2 weeks after insemination;
- Perform an ultrasound pregnancy diagnosis 30-35 days after insemination;
- Ewes lambing between 150 ± 5 days after the date of insemination will be considered as conceiving to insemination.

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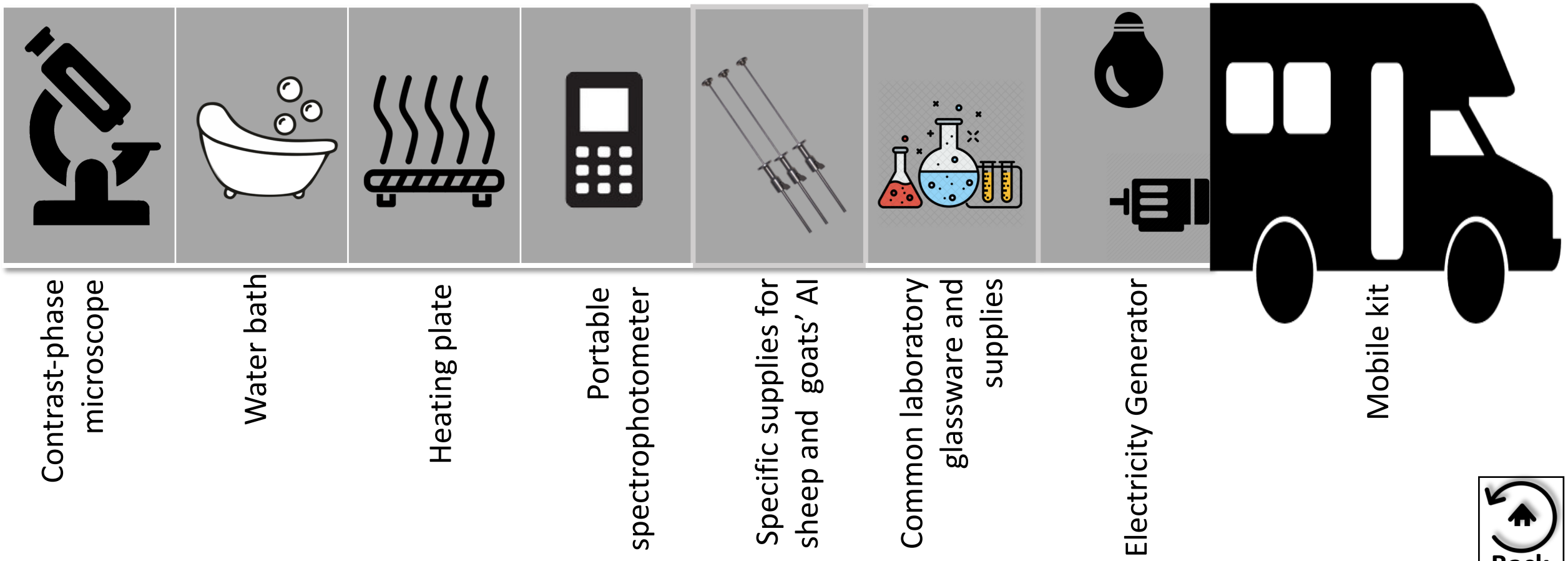
Low-infrastructure artificial insemination laboratory

This is related to the 7 physical structures ICARDA and its partners jointly developed, and these structures are embedded in the national collaborating centers



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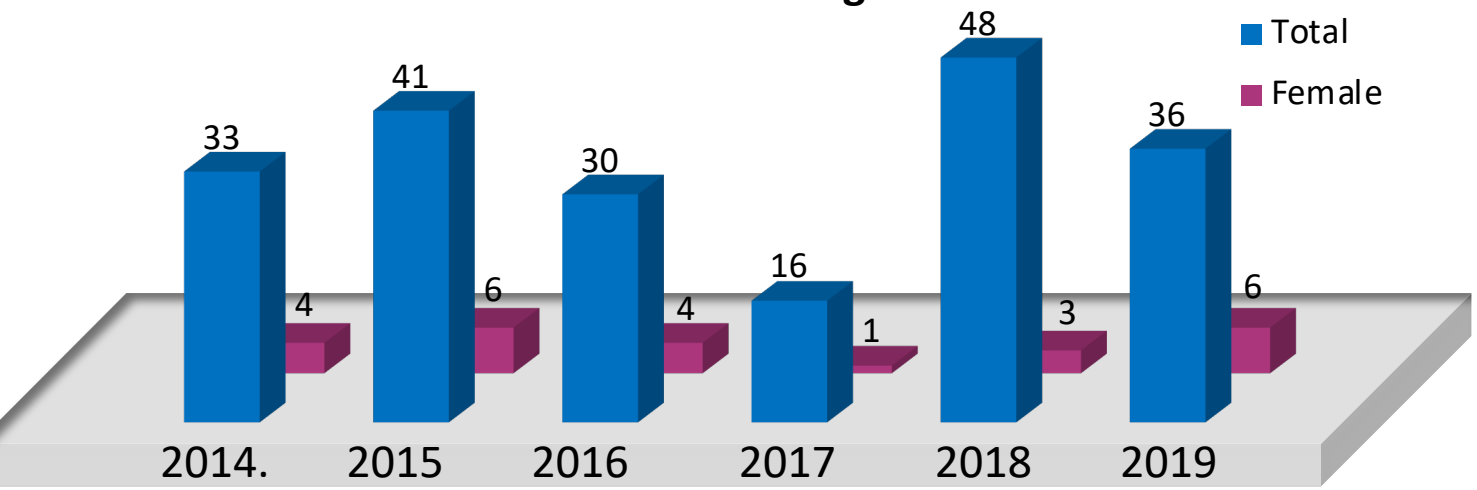
Capacity building

Short-term trainings



Menz + Doyogena

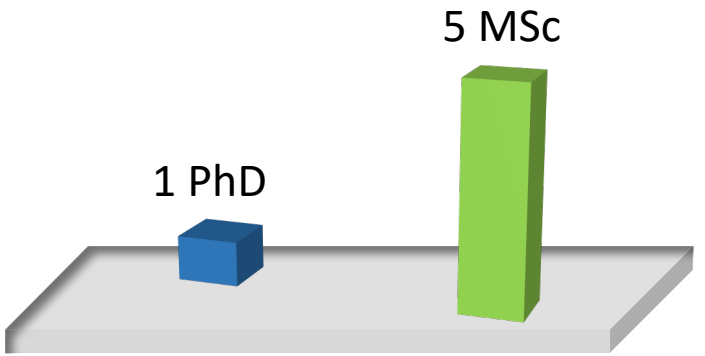
Menz + Doyogena + Bonga

Konso

Konso + Sekota

Konso + Sekota + Abergelle + Kilimanjaro

Degree level trainings



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Partnership

Ethiopian Institute of Agricultural Research (EIAR)

Ministry of Livestock and Fishery

Southern Agricultural Research Institute (SARI)

Tigray Agricultural Research Institute (TARI)

- Oromia Livestock Resources Development Agency
- Regional and district level cooperative office
- Livestock and Fishery Sector Development Project
- National Animal Genetic Improvement Institute (NAGII)
- Amhara Livestock Resources Development and Promotion Agency
- SNNPR Bureau of Livestock and Fishery Resources
- Tigray Agriculture and Rural Development Agency

Amhara Regional Agricultural Research Institute (ARARI)

Oromia Agricultural Research Institute (ORARI)

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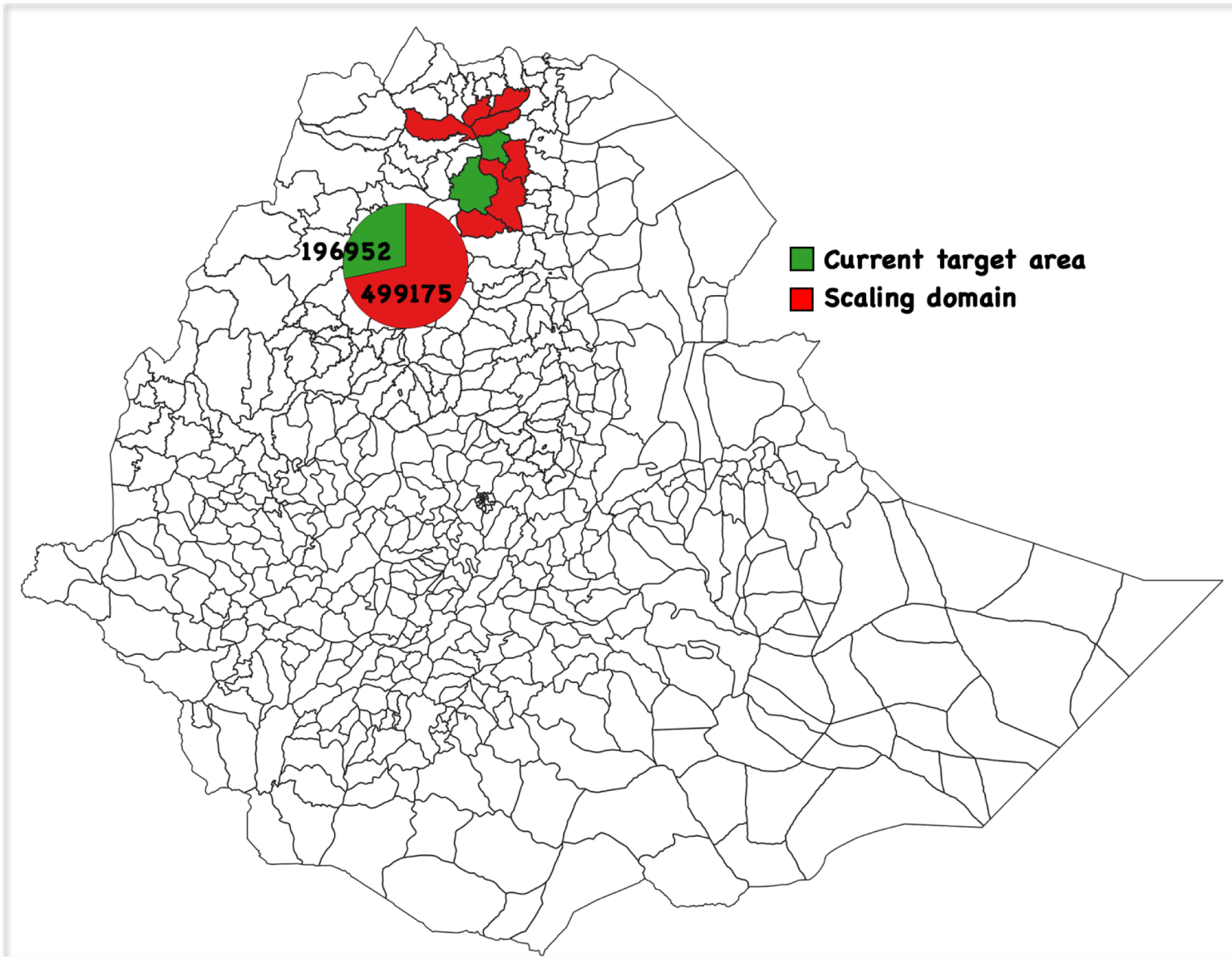
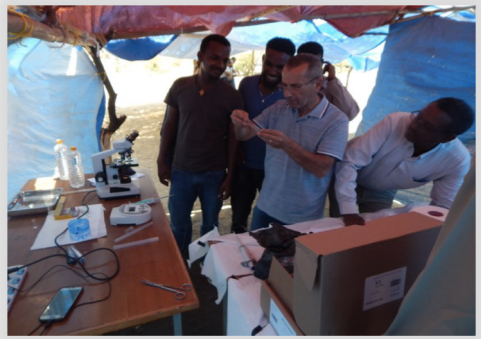
Abergelle





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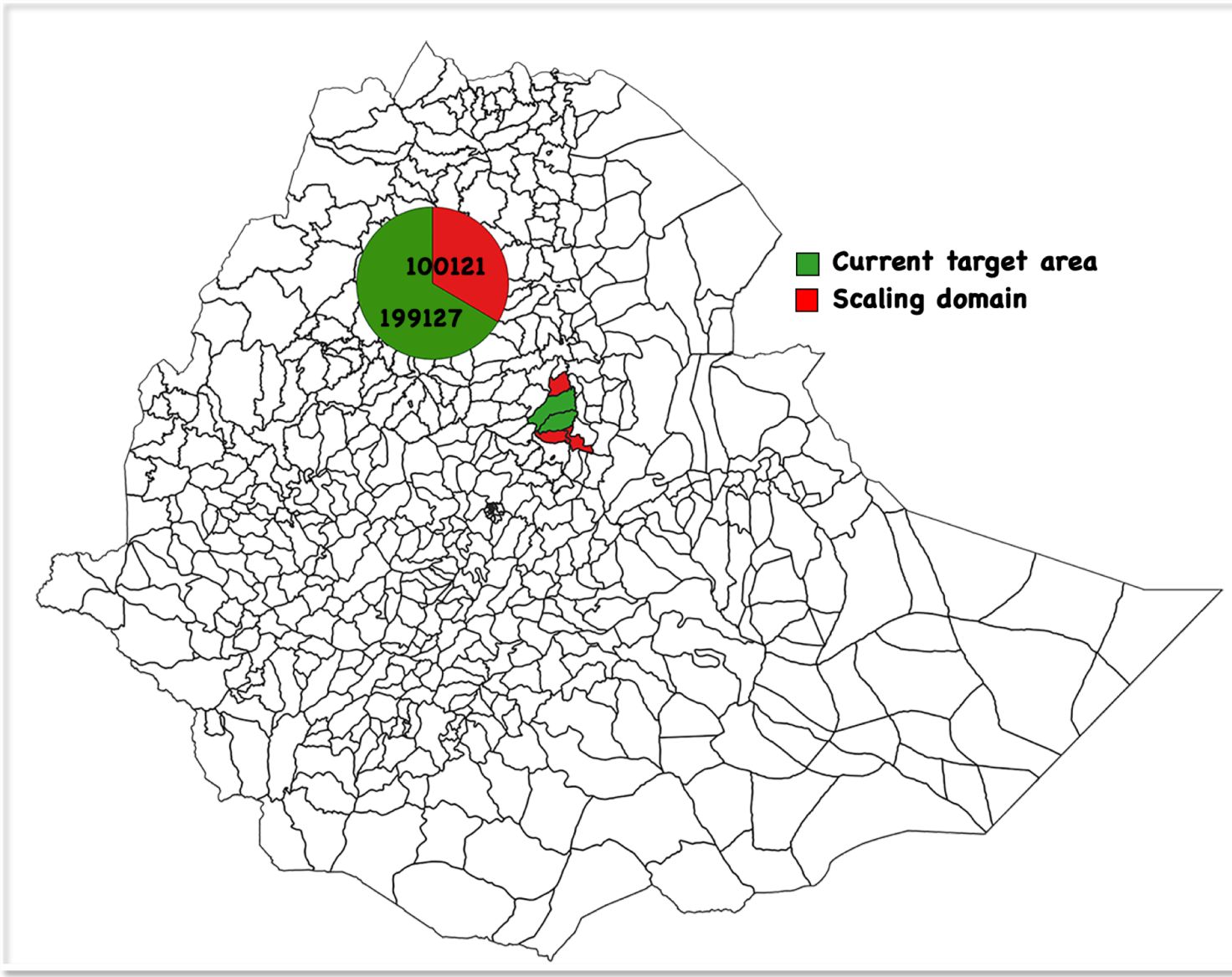
Menz



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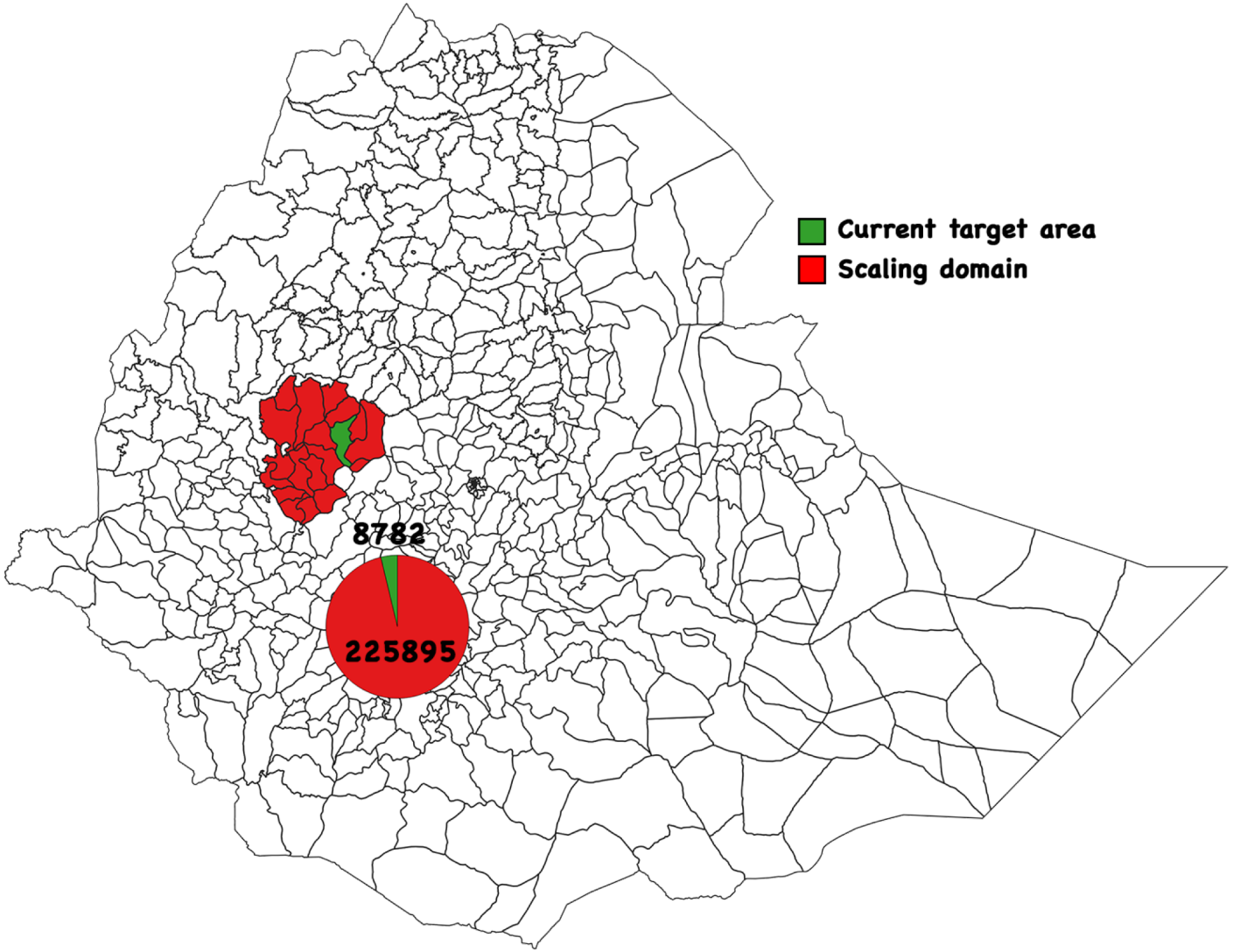

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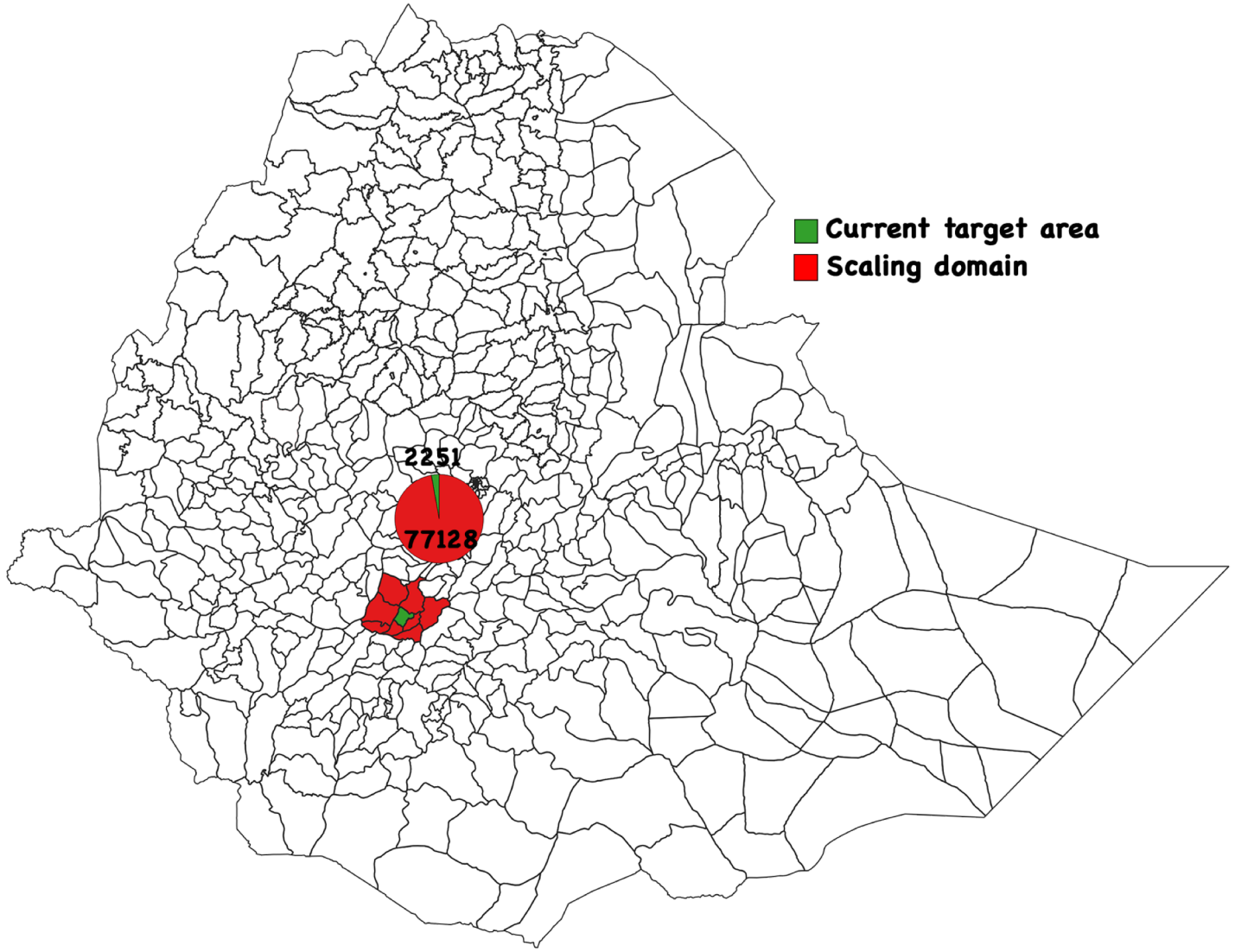
Doyogena



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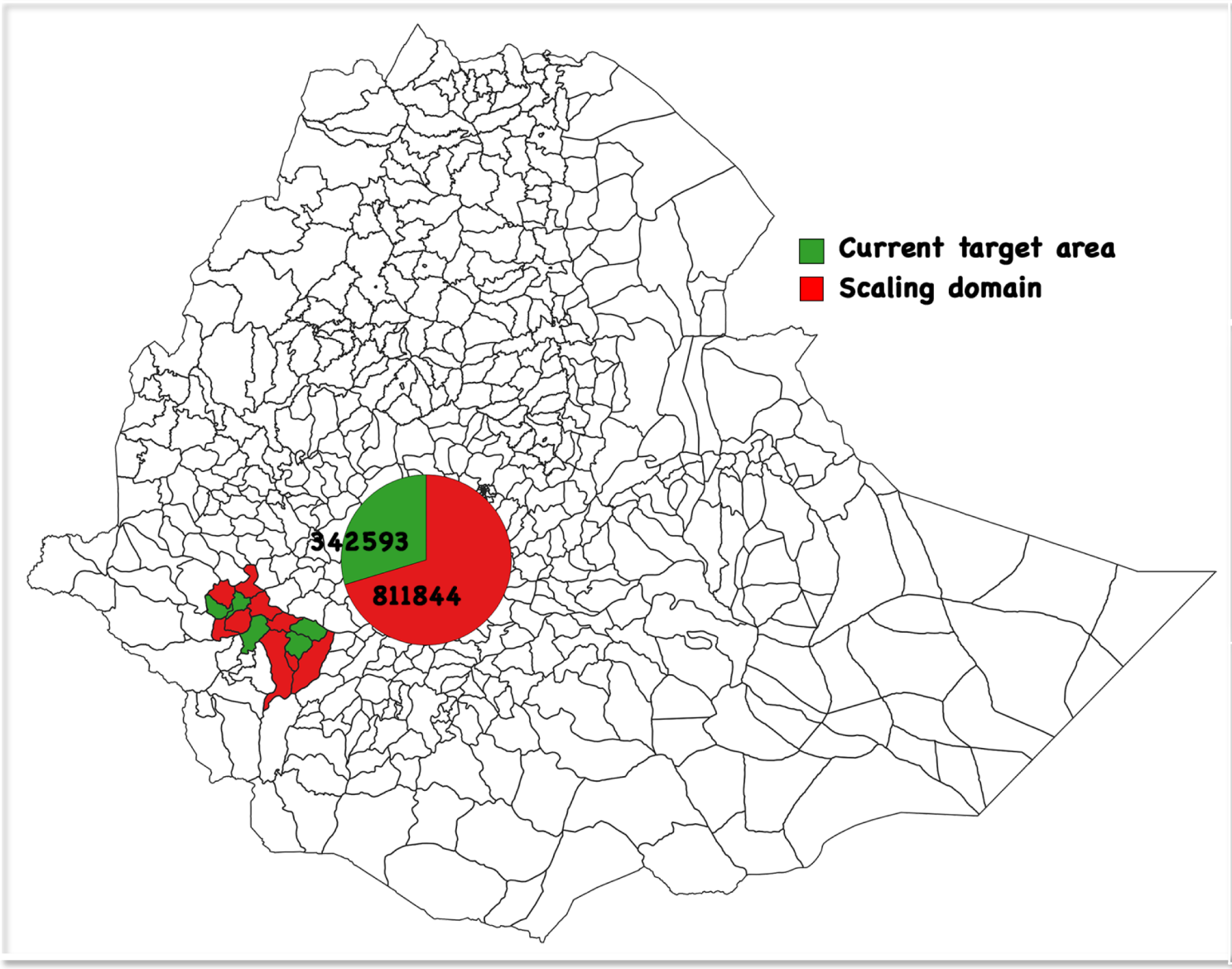
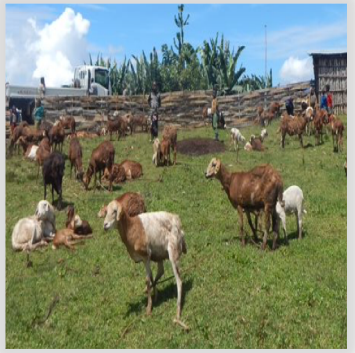
Bonga





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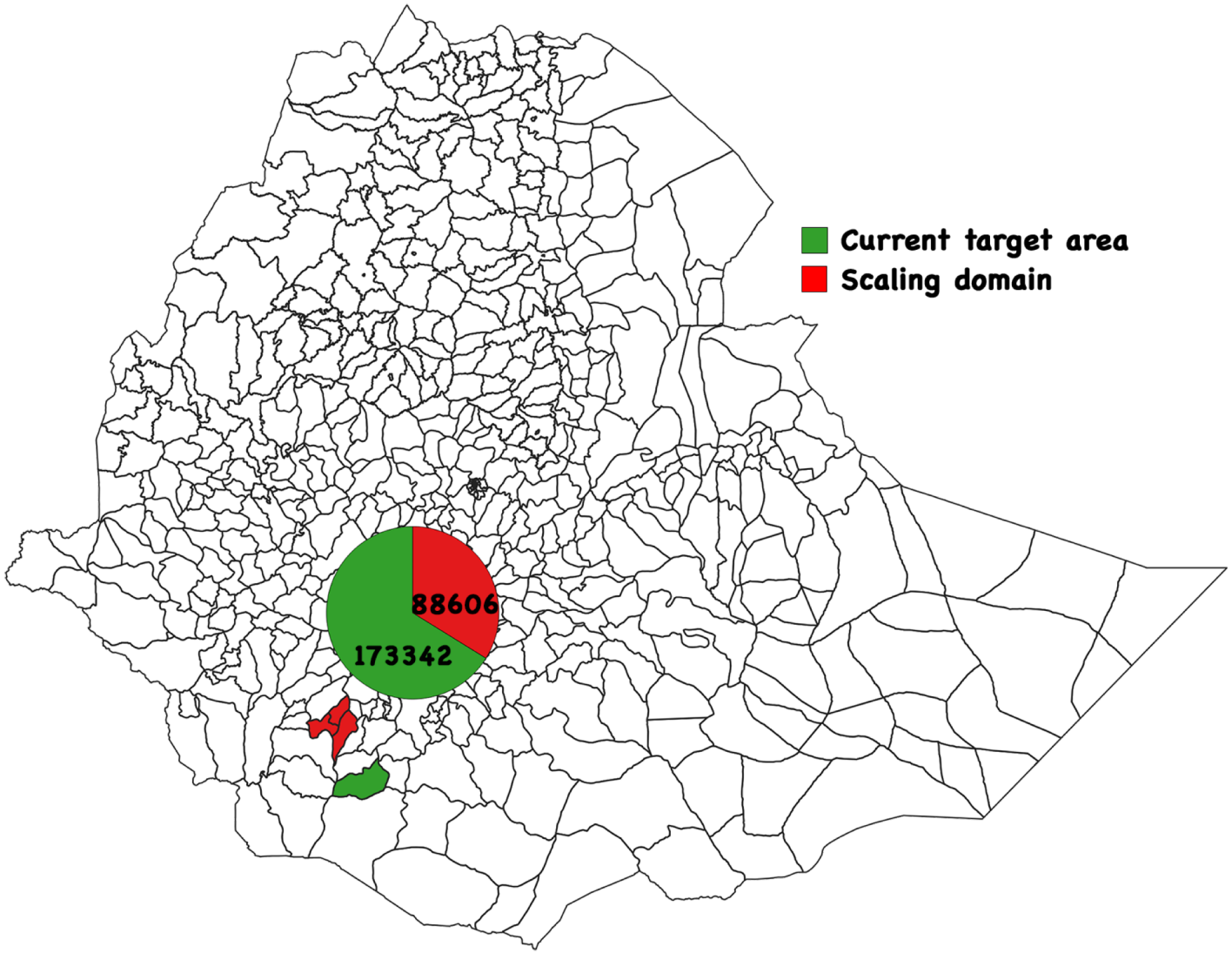
Konso



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