



Upscale of sheep and goat community-based breeding: Mid term report

**Midterm Review and Implementation
Support Mission (7-18 February 2022)**

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International Center for Agricultural Research in the Dry Areas

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Components of the project

1. Strengthen existing small ruminant community-based breeding programs (CBBPs)
2. Disseminate improved genotype
3. Establish field solutions for dissemination of improved genetics
4. Establish database and recording system
5. Monitor and evaluation of the breeding program
6. Market linkages



Awareness creation

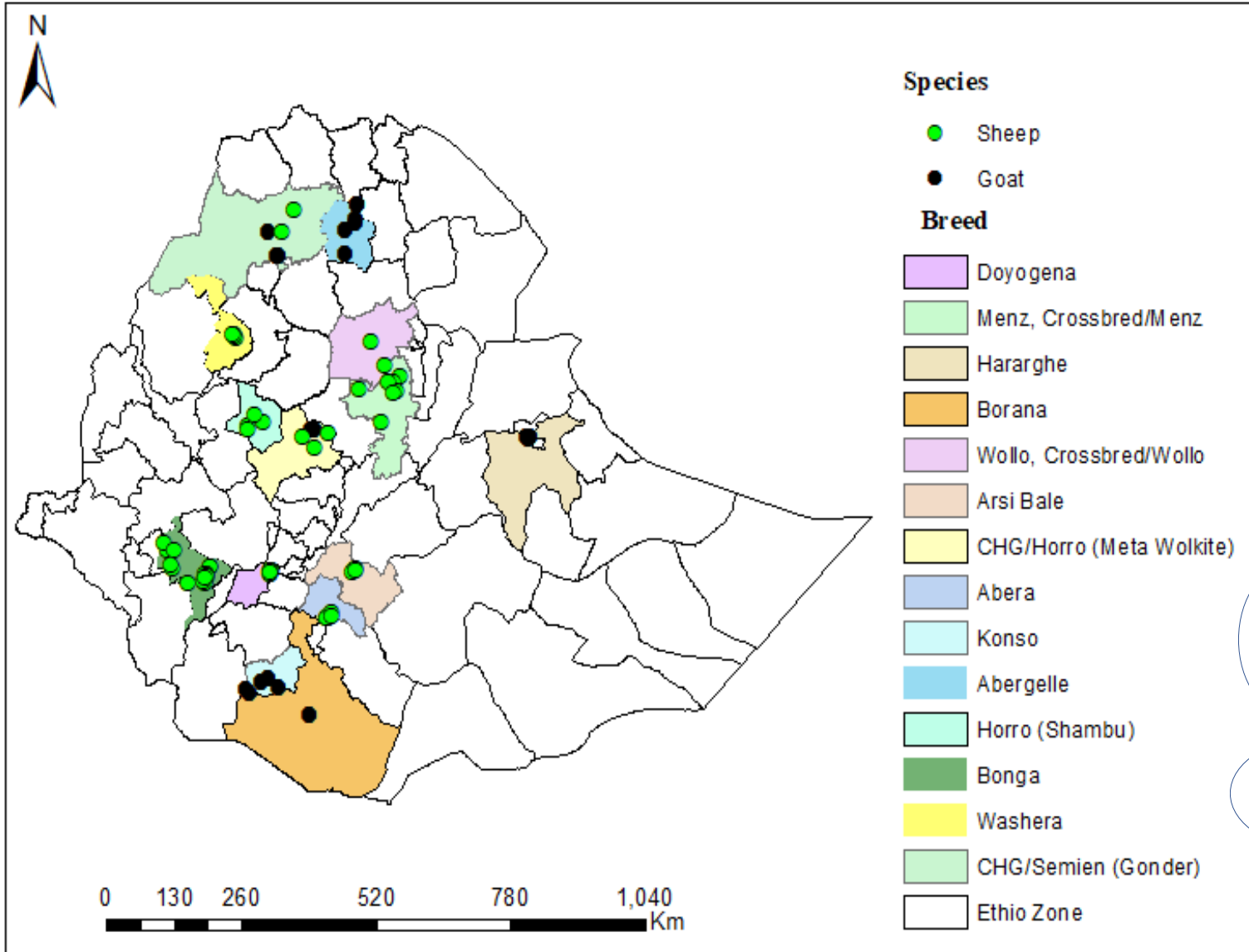
- Consultative meeting was organized with partners, including NARs, extension staff, LFSDP and ICARDA staff, for each region (4 regions).
- This was done in Sekota for Amhara, Adama for Oromia, Hawassa for South and Mekelle for Tigray.
- During the consultation/ planning meetings, detailed work plan and budget, the role of each partner and schedule of activities was discussed and agreed upon. A technical committee to follow on routine activities as well as steering committee tasked with the overall coordination was established.
- When implementing the upscale, farmers and enumerators were also made aware of the objective of the project and expectations from each party.



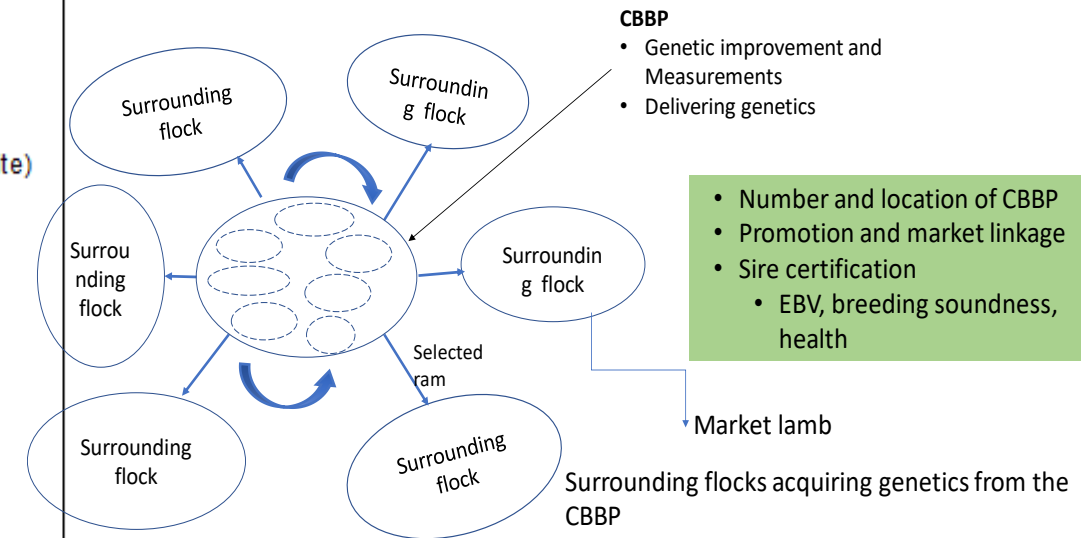
Sheep/goat population and sites

SR species	SR population targeted	Amhara	Oromia	South	Tigray
Sheep	Menz	X			
	Washara	X			
	Bonga			X	
	Doyogena			X	
	Abera			X	
	Horro		X		
	Arsi-bale		X		
	Begait				X
	Atsbi				X
Goat	Abergelle	X			
	Central highland	X			
	Konso			X	
	Central highland (Meta wolkite)		X		
	Harerge highland		X		
	Abergelle				X

Sheep and goat CBBP area coverage



- More than 100 breeding cooperatives established
 - Older/new CBBPs
 - Production sites



Capacity development (TOT and community trainings)

TOT to researchers, LFSDP staff, experts from regions

- Community-based breeding programs
- Framework for scaling of CBBP
- Reproductive biotechnologies (synchronization, AI, ultrasonography, certification of improved sires)
- Market linkages

Training to experts, DAs and enumerators

- Community-based breeding programs and scaling strategies
- Collection of baseline data, animal identification and startup of CBBP
- Reproductive biotechnologies (synchronization, AI, ultrasonography, certification of improved sires)
- Health care, feeding, breeding management and marketing of breeding and meat animals



Trainings.....

Farmers

- Awareness creation to farmers on what CBBP is, the importance of the CBBP upscale, operational framework and expectations from the different partners
- Animal management and principles of cooperative
- Selection, management and communal use of breeding sires
- Health care, feeding, breeding management and marketing of breeding and meat animals

Strengthening of existing CBBPs

- CBBPs in Amhara: Menz (5), Abergelle (5), Maksegnit (2)
- Oromia: Horro (2), Meta wolkite (2)
- South: Konso (5), Doyogena (8), Bonga (15)
- Sidama: Abera (6)
- Tigray: **Abergelle** (2), were strengthened
- Through provision of required materials (ear tags, marker applicator, weighing scales)
- Trainings to researchers, enumerators and farmers.

Consequently, these CBBPs were able to produce improved sires which were distributed to the production sites.



Procurement of operational materials

- For effective implementation of the project, items needed were procured and are being distributed when needed.
- Ear tags, ear tag markers, applicators, weighing scales, veterinary supplies and drugs were procured from the local markets and are being used.
- Lab items, consumables and synchronization hormones were imported.
- Two mobile laboratories are being established in Injibara and Haromaya Universities



Field implementation of upscaling

- Team of researchers and extension staff were engaged in identification of participant households based on criteria provided, collection of baseline data, animal identification, and startup of CBBP.
- Total of 1159 breeding sires were purchased and transferred from CBBP to production sites
- Total of 5976 households targeted
- Routine data recording is going on and there are new births from the distributed sires.
- Synchronization and AI in Abergelle, Sekota, Menz, Doyogena, Bonga and Konso





Region	Site	Species targeted	Households targeted	Number of sires disseminated	Partners
Amhara	8	Both sheep and goats	2336	363	LFSDP, LA, Debre Berhan and Gonder research Centers, Injibara University, ICARDA
Oromia	4	Sheep and goat	1792	380	LFSDP, LA, Adami Tulu, Bako and Holeta research centers, Haromaya University, ICARDA
Sidama	Abera	Sheep	305	74	LFSDP, LA, Hawassa research, ICARDA
South	2	Sheep and Goat	927	194	LFSDP, LA, Arbaminch and Areka research centers, ICARDA
South west	Bonga	Sheep	502	73	LFSDP, LA, Bonga research, ICARDA
Tigray	2	Sheep and goat	114	75	LFSDP, LA, Abergelle and Humera research centers, ICARDA
Total			5976	1159	

The Reproductive Platform to Deliver Genetic Gain in Sheep and Goats

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 ( + )



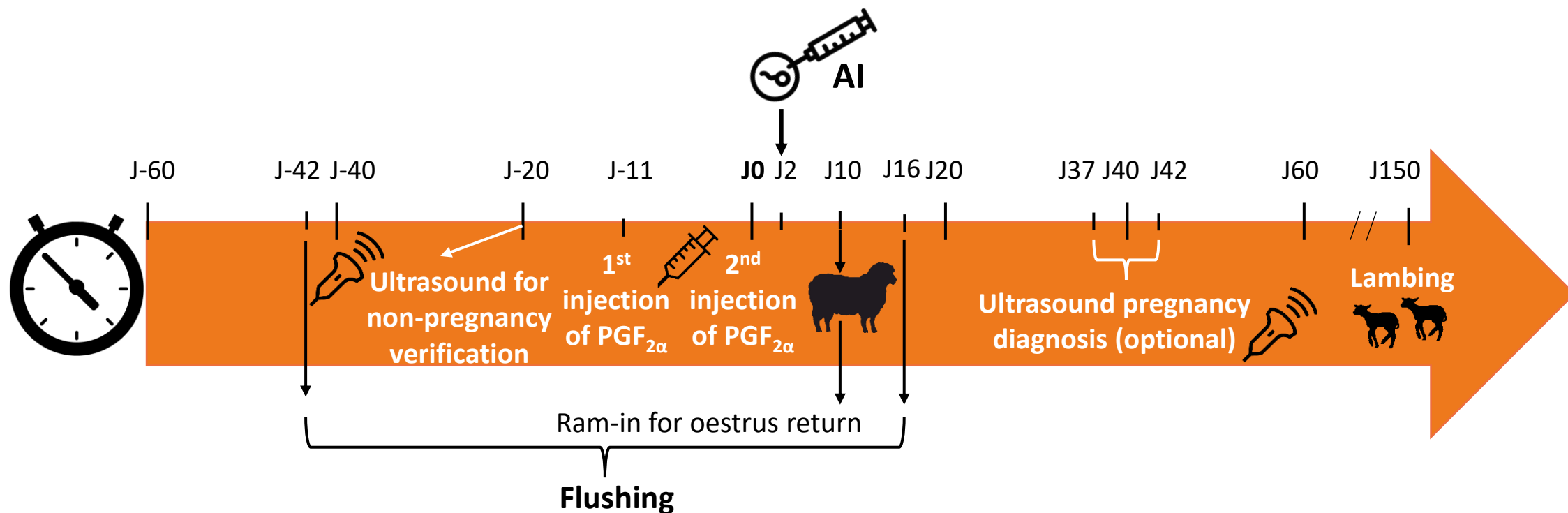
icarda.org # of members

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

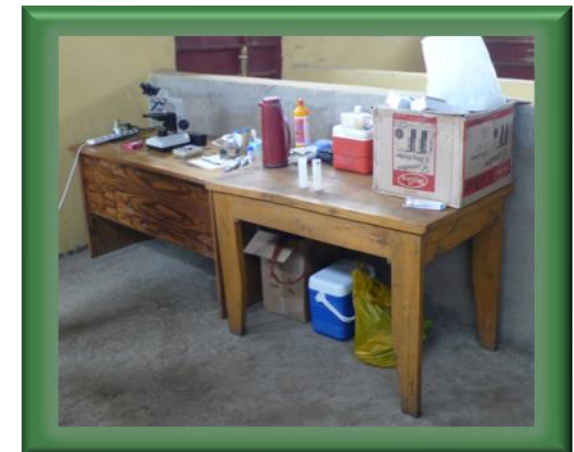
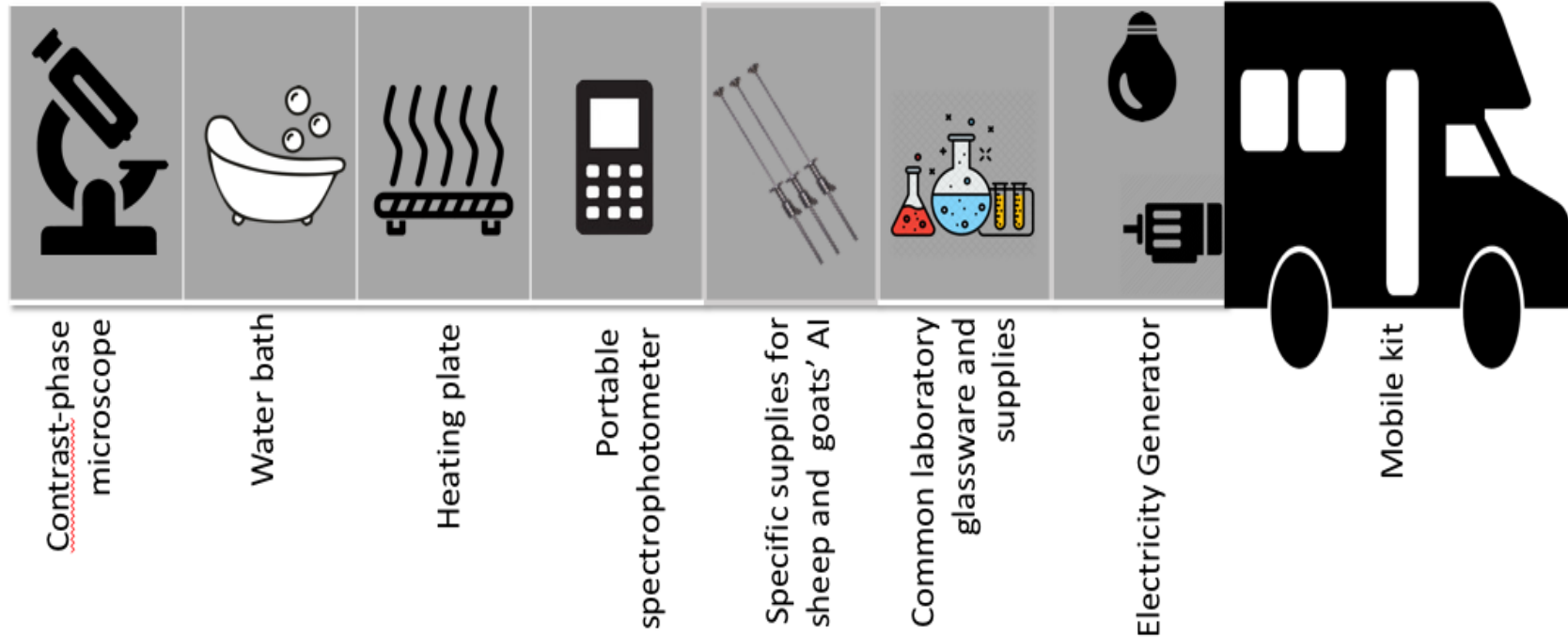
Validating innovative, simple, affordable and accessible artificial insemination



Using a synchronization protocol of 2 injections of prostaglandin 11 days apart:

- Increases fertility up to 89% in natural mating,
- Allows fixed time artificial insemination with a conception rate of 61% in  and > 65% in ,
- Saves on the cost: US\$ 1.3 vs. US\$ 8.5 for the conventional protocol,
- Locally available products to support delivery system.

Co-investment in low-cost, low-infrastructure AI, mobile labs



Certification of all pre-selected yearling rams and bucks in Menz, Bonga, Doyogena and Abergelle

Ram Pre-Breeding Examination: On-farm Data Collection Form (Doyogena CBPP)

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There should be a tick, measurement, comment, or 'NE' (not-examined) in each white box.

Date of birth/Age (months)				
BCS (out of 5)				
If normal, then write N. If abnormal then describe e.g small, enlarged, soft, hard, lumpy, swollen...	Teeth			
	Feet			
	Rest of body			
	Brisket			
	Prepuce			
	Penis			
	Scrotum			
	Testicles size	L	R	
Epididymis head	L	R		
Epididymis tail	L	R		
Scrotal circumference (cm)				
Semen collection method	1st collection		2nd collection	
	AV	EEJ	AV	EEJ
Volume (ml)				
Gross density				
0 (clear) -5 (double creamy)				
Gross motility/ wave motion (0-5)				
Mating ability				

Vaccination	Date
Brucellosis	
Sheep pox	
Peste des Petits Ruminants	
Foot and mouth disease	
Enterotoxaemia	

	500371
	AGE
	Estimated breeding value

Ram Pre-Breeding Examination Certificate (Doyogena CBBP)

Date of Examination: _____

1. Physical examination

Body condition score (1-5)	NAD	Abnormal
Eyes, nose and mouth		
Conformation and limb soundness		
Feet		
External genitalia		
Scrotal circumference		cm
Overall results: SATISFACTORY* / UNSATISFACTORY*		

NAD = No Abnormality detected, *delete as required

Tick as appropriate

2. Semen examination

Collection method	AV*	EEJ **
Appearance/density	/5	
Gross motility	/5	
Overall results: SATISFACTORY* / UNSATISFACTORY*		

*AV: Artificial vagina; ** EEJ: Electro-ejaculator

3. Assessment of mating ability and libido

This ram has been observed exhibiting normal service behavior and mating ability	
This ram has not been observed exhibiting normal service behavior and mating ability	

Tick as appropriate

4. Classification

SUITABLE FOR BREEDING	based on meeting the requirements of section 1 only
SUITABLE FOR BREEDING	based on meeting the requirements of section 1 and 2 only
SUITABLE FOR BREEDING	based on meeting the requirements of section 1, 2 and 3
UNSUITABLE FOR BREEDING	

Name of District-Head Animal Production Office	
Date	
Certificate No	

Signature and stamp

Doyogena



MINISTRY OF AGRICULTURE



SARI 2000

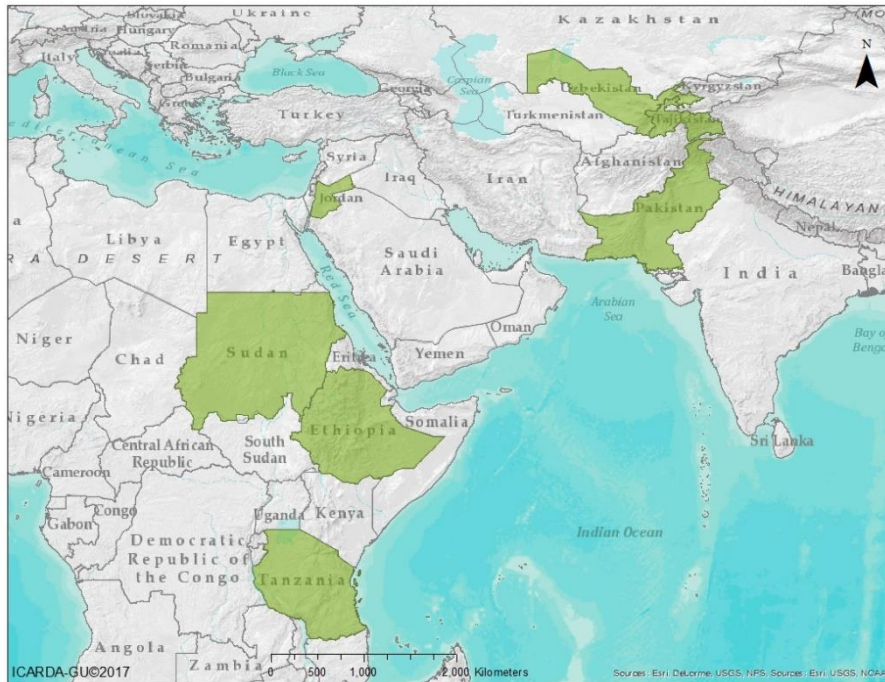
Showing the road to business opportunity and youth employment



Mobile ultrasound pregnancy unit in the Badia - Jordan



The goat obstetric and genecology clinic in Kordofan - Sudan



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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 Service

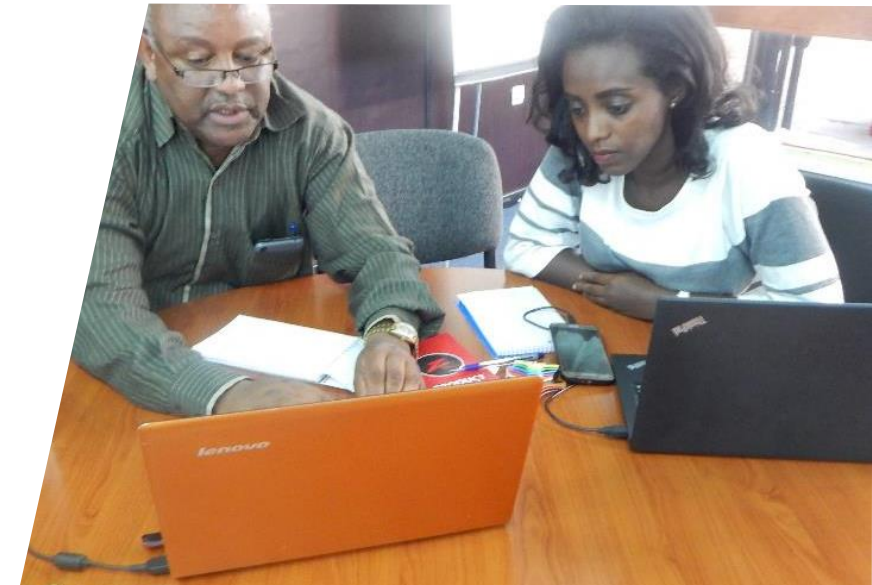
Calculation of the age of the fetuses

Check on repeat breeders

Screening for litter size

Establishment of database and recording system

- ICARDA, Ethiopia's NARS partnered with AbacusBio, and developed a cloud-based genetic database platform called Dtreo
- DTREO
 - Is flexible and easy to use, that allows users to capture and save data offline, data is uploaded to the database once an internet connection has been established
 - Dtreo helps to avail more accurate estimated breeding values (EBVs)
 - Helps to provide quick feedback to communities
 - Provide EBVs with higher accuracy
 - Dtreo can also build reports, provide analysis and create graphics
 - 67,000 plus records of lambing/kidding.
 - 125,500 plus live weight records at different ages
 - 23,000 plus milk records
 - Data recording in CBBP and production sites



Market linkage establishment

The focus

- Sale of breeding and meat animal
- The upscale operation has created lucrative market for breeding sires as large number of animals are being purchased and disseminated from CBBP sites through LFSDP, livestock agencies of the regions and some NGO's
- This is encouraging and breeding cooperatives are benefiting from this.



Link with slaughterhouse

- Several attempts were made
- Almost all failed with sheep because of good price in local market
- Need to think about increase production, culled animals from breeding, no color preference
- We moved to goats
- Our work with Allana
- 97 Konso goats purchased, slaughtered and exported to Dubai
- Feed back: good quality, no meat darkening
- The result is communicated to all actors involved in the process to realize the test slaughter at Alana export abattoir.
- The experience from Konso market linkage shall be used to establish similar initiatives in all sites.





Establishment of breeders cooperatives

- Breeders cooperatives have been found to be effective institutions for implementation and overall running of CBBPs.
- The actual establishment of the cooperatives is done by the cooperative's bureau of each district, through awarding a legal license.
- The formally registered cooperatives have by-laws and a formal organizational structure.
- Three groups of committees manage the cooperatives: a main committee with a chair, a procurement committee, and a control committee.
- Formally registered cooperatives have access to free auditing services from district cooperative promotion offices and financial record-keeping training and support.
- So far, nine breeders cooperatives have been legally established and many are in the process.
- These cooperatives, although established as breeding cooperatives, could be used as entry point for other interventions too.

- Lambs/kids has been produced
 - From the first round sire dissemination a total of 542 (217 in Kore and 325 in Abay Chomen) were born in Oromia
 - 1492 lamb/kid reported in 4 sites in Amhara region(Washera sheep, Central Highland goat, Abergelle goat and Semien sheep)
- CBBP is being part of the extension work
 - Extension experts and DAs in many sites were responsible for routine monitoring of data collection, sire management and use
- Capacity development
 - Several trainings in data collection, management, analysis, reproduction technology
 - Reproduction technology facilities
- Good market has been created for the nucleus CBBPs
- Producer cooperatives benefited by accessing improved rams
 - Revert negative selection
 - Sire shortage solved and thereby lamb/kid production increased
 - Better lamb/kid growth expected
 - Market link established -

Farmer's perception and our field observation



- Farmers are aware of the importance and benefit of using selected rams
- Some farmers told us many lambs has been produced and told us that they are very happy as they got good lambs having similar colour and performance with the sire they are using
- Farmers told us that all lambs born from the sire we are using look fast growing even when the dams are not good
- They practiced sire sharing among themselves
- All mature males other than the disseminated rams were castrated or isolated from the flock
- Many of them engaged in sheep fattening
- Many farmers do record as per the format given to them.
- We observed that only disseminated ram serving in all flocks

- CBBP can be attractive option for sheep and goat improvement in low input systems
- You need support from committed staff (research and extension) to fully get its benefit
- Genetic improvement effort should be part of an overall livestock development agenda across the whole value chain
- Market linkage is critical to fully exploit the reward from CBBP
- Fairly cheap innovation compared to other strategies
- Listen to communities, don't subscribe

Challenges

- COVID
- Confusion related to funds
- High turnover and reshuffling of DAs considered as main challenge for the continuous follow-up.
- Enumerators??? We are trying to link with Research and Universities for sustainability

Thank you!!!

