

# Platform for African Dairy Genetic Gains (ADGG)

Herd Recording and Farmer Education Using Digital Platforms are Feasible and can be Transformative in Africa

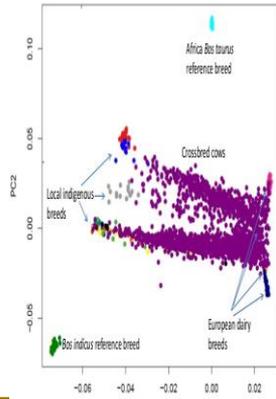
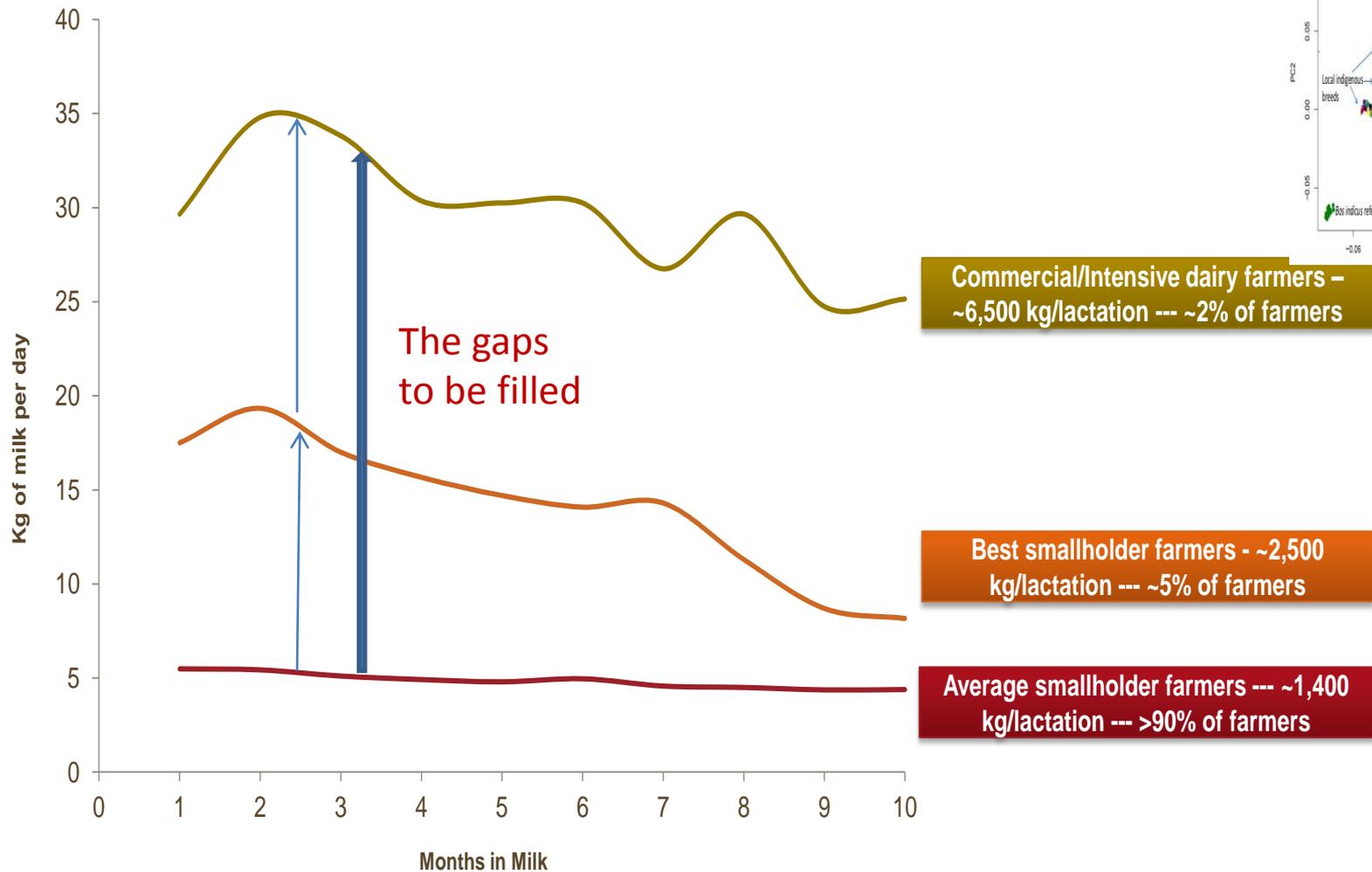
Okeyo A.M., R. Mrode, J. Ojango, J. Gibson, M. Chagunda, Negussie Enyew, E. Kefena, E. Lyatuu, S. Kahumbu and S. Kemp.

Mid-Term Livestock Genetics Flagship Meeting, ILRI, Nairobi, 5-6 September 2017

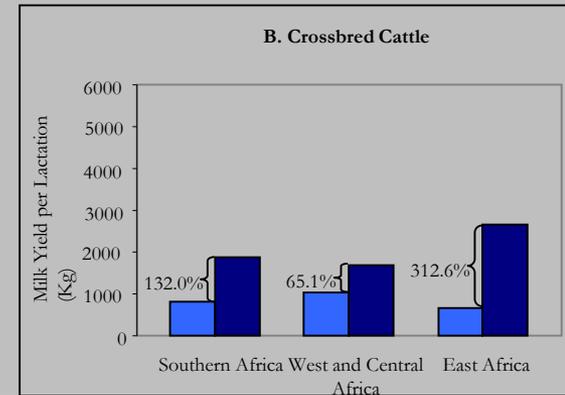
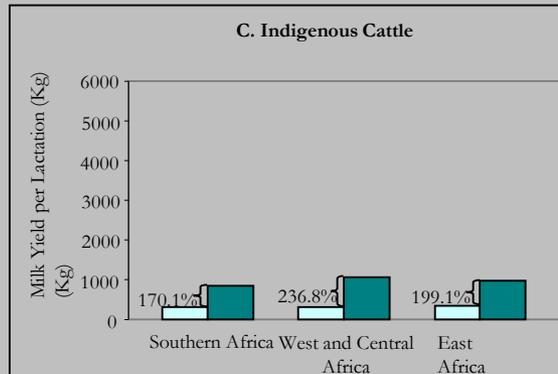
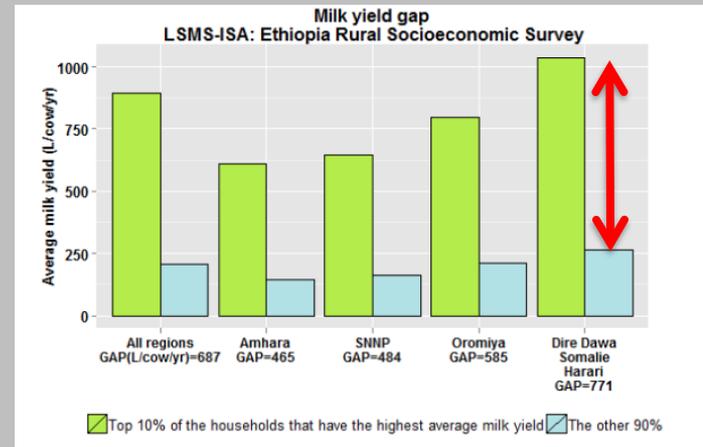
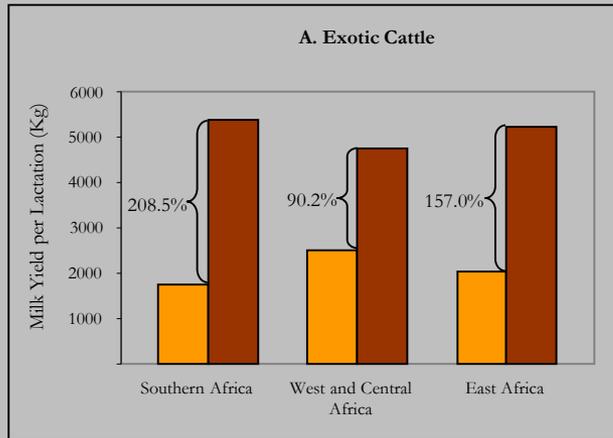


# Some Background

Figure 1: Realized lactation curves of improved (crossbred or higher) dairy cows achieved by different farmer types in Kenya



# Yield gaps cont.



Mwacharo *et al.*, 2009; Mario, 2016

# The problems in the smallholder dairy systems

- Majority of farmers do not have access to information or education and training services that would help them improve herd productivity and system profitability.
- No effective formal performance recording and systemic & sustainable breeding programs, so breed types kept are not necessarily what is desired or desirable!
- Access to input, market services, including AI service that are necessary for sustained productivity gains is inadequate.
- Limited access to the dairy genetics or breed types that best suit the different production systems

# To try and bridge the huge productivity gaps and environmental challenges, transformative approaches are needed

*Fewer, but more productive & profitable cows should be kept!*

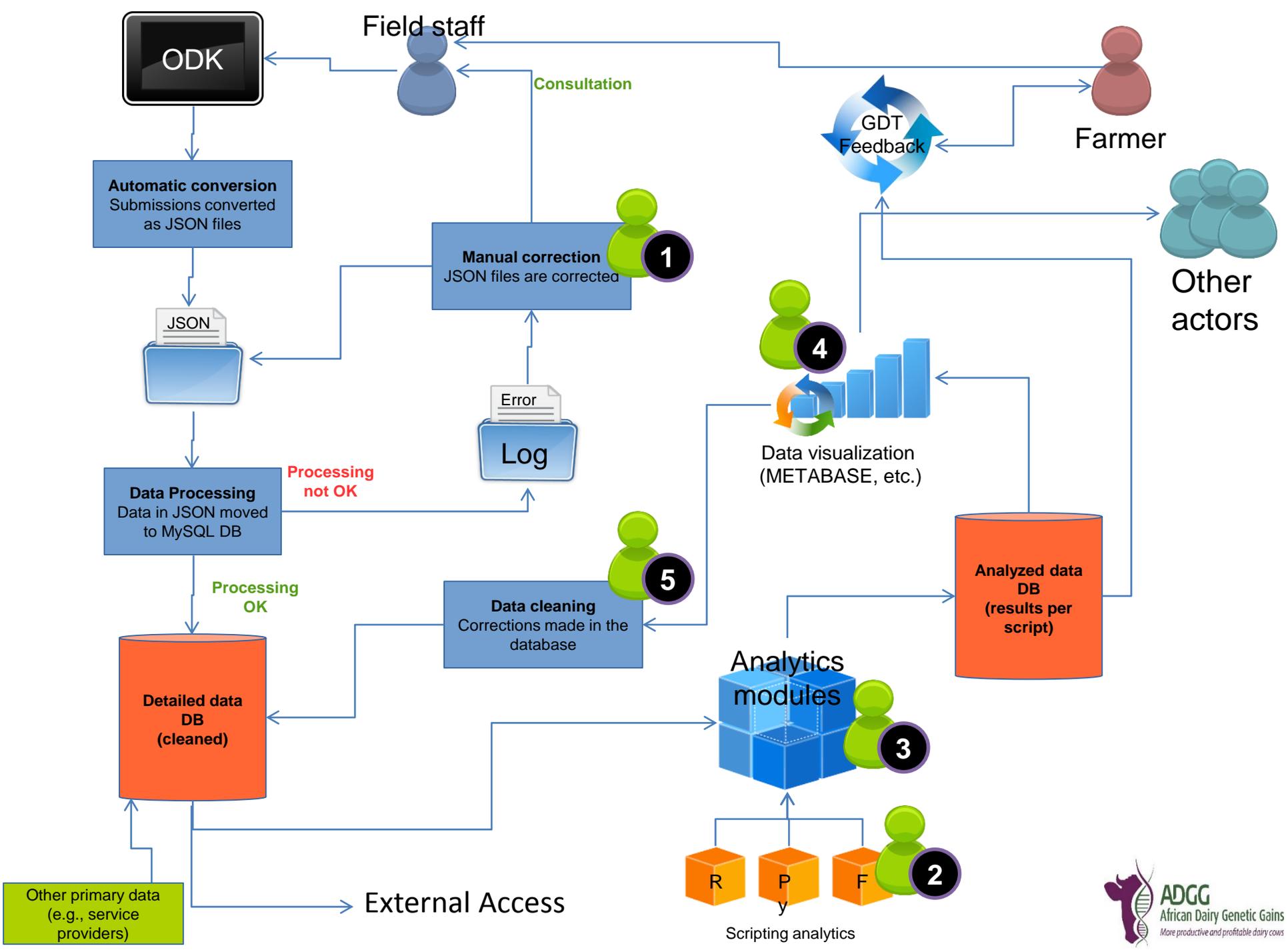
Innovative applications of:

- Information & communication technologies
- Genomic technologies
- Reproductive technologies (*AI as bundled private service*)
- Smart Public-Private Partnerships

# ADGG Objectives

1. To establish National Dairy Performance Recording Centers (**DPRCs**) for herd and cow data collection, synthesis, genetic evaluation and timely farmer-feedbacks (*7 Sites in ET & TZ ;100,000 herds by year 3*).
2. To develop & pilot an ICT platform (**FFIP**) to capture herd, cow level & other related data & link it to **DPRCs** & feeds back key related herd/cow summaries, dairy extension & market information etc. (*Feedbacks that objectively inform farmer decisions*).
3. To develop low density genomic chip for breed composition determination & related bull certification systems for crossbred bulls (*at least 20 young certified bulls drafted for semen production/natural service per country*)

# The approach



# Partnership with PAID, Govt & Private Agencies

- Shared data capture, Analytics and Feedback Platform with PAID & Other private AI service provider e.g. ABEA
- The NAIC, other Bull studs and semen producers, TANLITS; & ETLITS (Bull certification & livestock identification)
- The NAIC-ATA; TALIRI-EGA- partnerships to share platform for farmer education and feedbacks (*same farmers being targeted*)
- Partnership with genomic Technology companies to developing and delivering the assay (genomic chip)
- Piloting of the value for testing natural mating bulls, **heifers** and cows among large scale farms

# Outputs and Outcomes

- DPRC-NAIC-LUKE & ETLITS? Databases integrated and more animals performance recorded
- More than 25,600 farmers & 41,630 cows registered on the DPRC platforms are linked to iCow platform & are directly receiving dairy education materials.
- Data analyzed and summaries feedback to farmers **directly** and via PRAs & AITs (*Which of your cows is generating profit for your?*) **so** farmers are making more informed decisions.
- Genomic chip being developed to certify young bulls & heifers (breed composition/parentage ascertainment)



# Achievements & \*Planned by end 2017

By	Number of herds registered	Number of animals & records
NAIC-LUKE/TALIRI/TANLIT/NAIC (before+manual)	650 (ET); 200 (TZ)	>6,000 (ET); <1000 (TZ) (>108,000 records)
ADGG & PAID (now)	25,622 (ET&TZ)	41,631 (ET &TZ)
*Number to be genotyped		5,000

\* **Includes:** All NAIC bulls, all bull dams, all active village crossbred bulls, selected crossbred cows and bulls in large scale farms

# Challenges

- Digital literacy slowed progress
- High staff turn-over for the system developers & programmers and inadequate server capacities
- Limited internet coverage & connectivity
- Unsupportive internal and partners policies (PPP frameworks exist, but their operationalization is ???)
- Many and often conflicting demands by scientists on what to record-complicating the data forms

# Opportunities

- Integration of DPRCs: multi-species recording & multi-disciplinary (e.g. animal health) recording/investigations can be leveraged on these platforms
- Robust protocols developed for genetic evaluation of bulls & cows and local experts trained on these
- Teams of GEBV ranked young bulls/heifers (*top-ranked bulls to be drafted into national/regional AI stations*)
- Relevant/customized farmer education materials developed and being e-delivered.
- More than 40 Local Scientists trained to manage the DPRCs and 350+ AI Techs/PRAAs to deliver farmer education and AI services.
- Potential for developing synthetic tropically adapted dairy cattle breeds thro inter-country collaborations (>220,000 crossbred heifers by year 5)



FARMERS



BILL & MELINDA  
GATES foundation

NARES & Regional  
Governments

