

*The chicken of the future
Options from breeding and
research*

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Huge increases over the 2005/7 amounts of cereals, dairy and meat will be needed by 2050

From 2bn to 3bn tonnes cereals each year

From 664m to 1bn tonnes dairy each year

From 258m to 460m tonnes meat each year



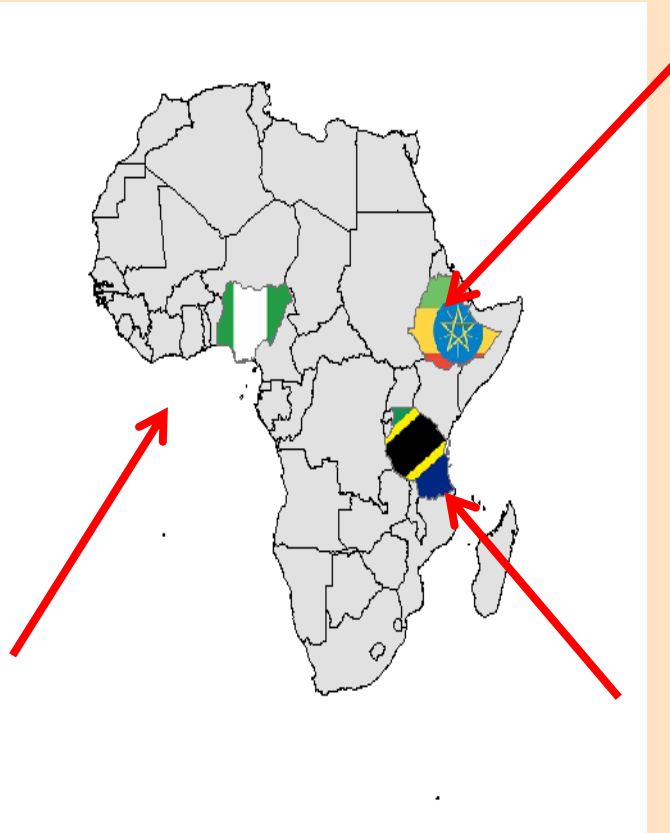
Poultry production is expected to account for **44%** of the 49.1 M Tons increase in global meat production by 2025 and **73%** of this increase in production is expected to occur in developing **countries** (OCDE – FAO 2016)*

*OECD/Food and Agriculture Organization of the United Nations (2015), OECD-FAO Agricultural Outlook 2015, OECD Publishing, Paris.
http://dx.doi.org/10.1787/agr_outlook-2015-en

The chicken of the future

- Dual purpose birds (egg, meat)
- Better in water and feed conversion efficiency
- Adapted to a diversity of production environments
- Improved immune competency
- A diversity of options (producer and consumers preferences and needs)

- Kuroiler
- Koekoek
- Sasso
- Shika Brown
- FUNNAB
- Alpha
- Fulani + XX
ecotypes in
the sites

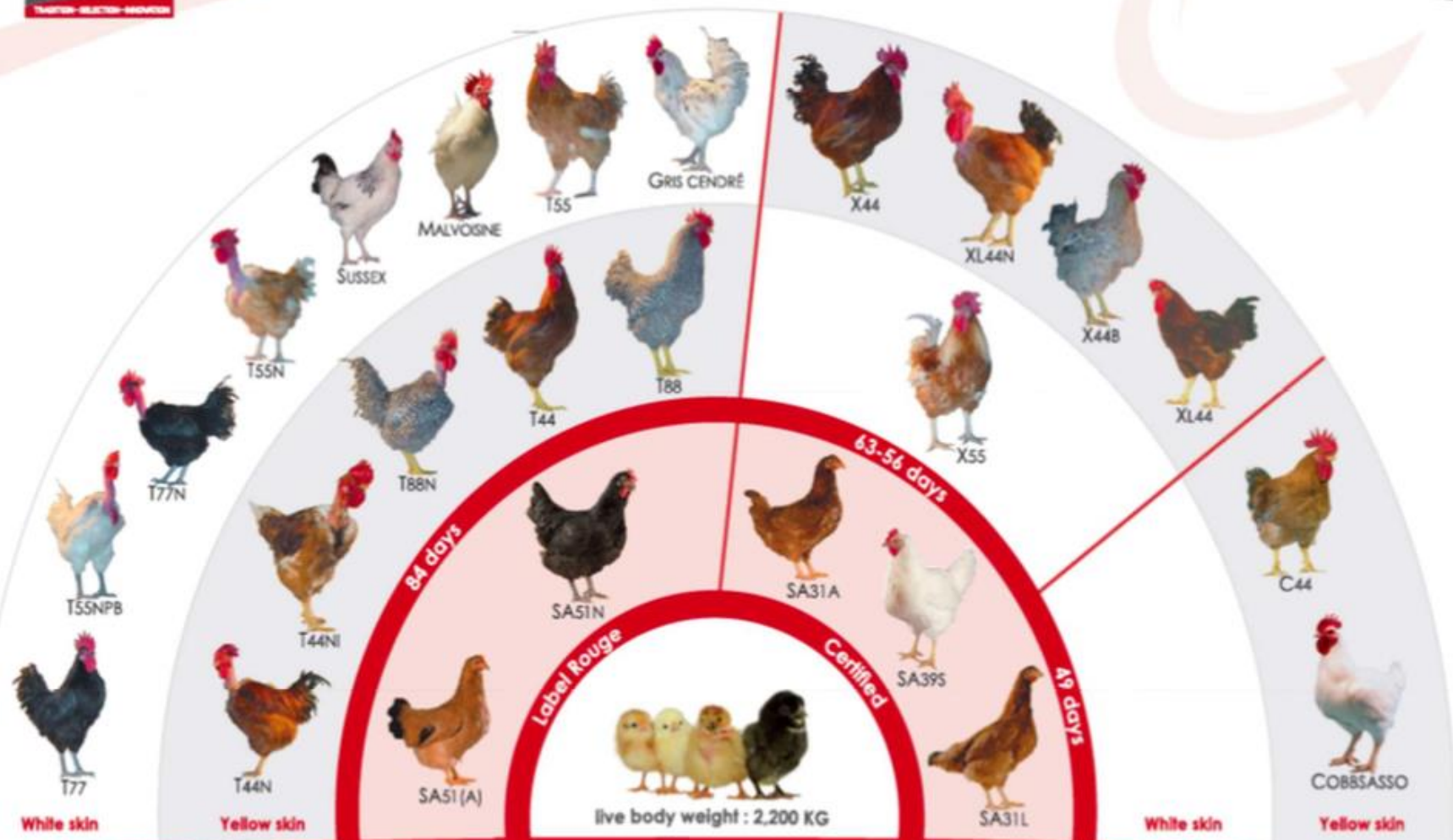


- Kuroiler
- Koekoek
- Sasso
- Fayoumi
- Horro + XX
ecotypes in
the sites

- Kuroiler
- Koekoek
- Sasso
- Fayoumi
- Australorp
- Horasi + XX
ecotypes in
the sites

The breeding options.....

- Local within breeds improvement of the best ACGG strains
- Crossbreeding with the local/indigenous ones
- Off the shelves options.....
 - “Sasso” approach
 - CCP and PCCC approach.....



THE WORLD'S LARGEST CHOICE IN COLORED BREEDERS



Koen Vanmechelen

The most diverse chicken population in the world.....

THE COSMOPOLITAN CHICKEN PROJECT (CCP)
1999 — 2016

CCP



♂ MECHELSE KOEKOEK
Belgium × POULET DE BRESSE ♀
France



♀ MECHELSE BRESSE
CCP × ENGLISH REDCAP ♂
England



♀ JERSEY GIANT
U.S.A. × MECHELSE REDCAP ♂
CCP



♂ MECHELSE GIANT
CCP × DRESDNER ♀
Germany



♀ UILEBAARD
The Netherlands × MECHELSE DRESDNER ♂
CCP



♂ MECHELSE UILEBAARD
CCP × LOUISIANA ♀
Mexico



♀ MECHELSE LOUISIANA
CCP × ไท ♂
Thailand



♂ MECHELSE ไท ♂
CCP × AURACANA ♀
Brazil



♀ DENIZLI HOROZU
Turkey × MECHELSE AURACANA ♂
CCP



♀ MECHELSE DENIZLI
CCP × CUBALAYA ♂
Cuba



♀ ANCONA
Italy × MECHELSE CUBALAYA ♂
CCP



♂ MECHELSE ANCONA
CCP × ОРЛОВСКОЙ ♀
Russia



♂ MECHELSE ОРЛОВСКОЙ
CCP × 乌鸡 ♀
China



♂ MECHELSE 乌鸡
CCP × لَيْسِيومي ♀
Egypt



♀ POULET DE SENEGAL
Senegal × MECHELSE لَيْسِيومي ♂
CCP



♀ MECHELSE SENEGAL
CCP × STYRIAN ♂
Slovenia



♂ SULMTALER
Austria × MECHELSE STYRIAN ♀
CCP



♀ MECHELSE SULMTALER
CCP × AYAM CEMANI ♂
Indonesia



♂ MECHELSE CEMANI
CCP × WYANDOTTE ♀
Detroit



PLANETARY COMMUNITY CHICKEN

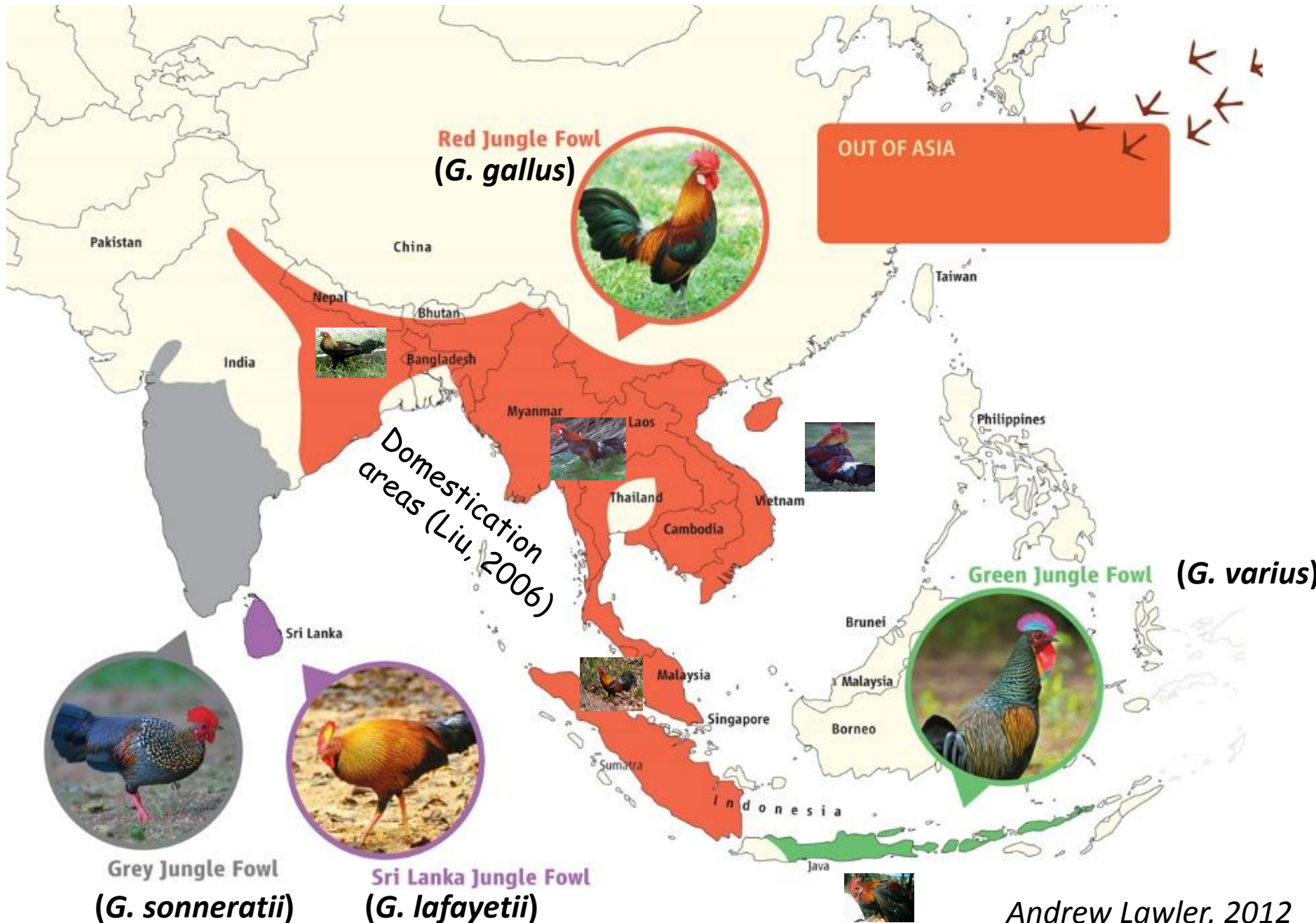
PCC



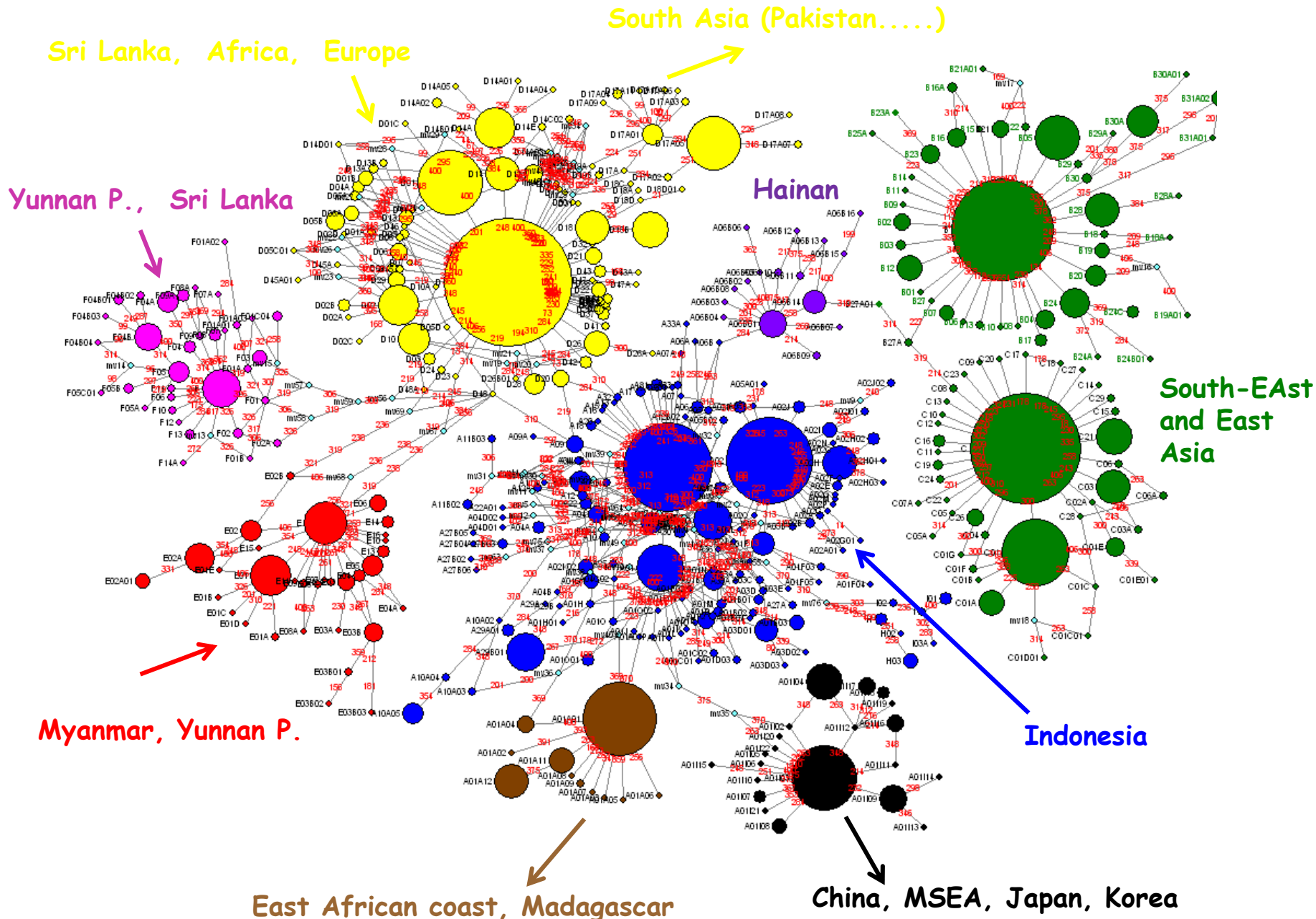
The research support (ILRI – Poultry program)

- Understanding of poultry genetic diversity at genomes level
- Understanding of poultry adaptive traits in relation to the environment
- Understanding of the host – microbiome interactions
- Ex – situ conservation and genome editing

Geographical distribution of the wild junglefowls



Domestic chicken mtDNA D-loop diversity



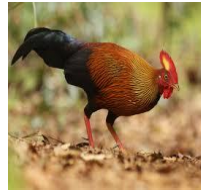


Junglefowl sp introgression in domestic chicken Insight from whole genome sequences

R. Lawal UoN PhD thesis ongoing...



◆ Green



◆ Ceylon



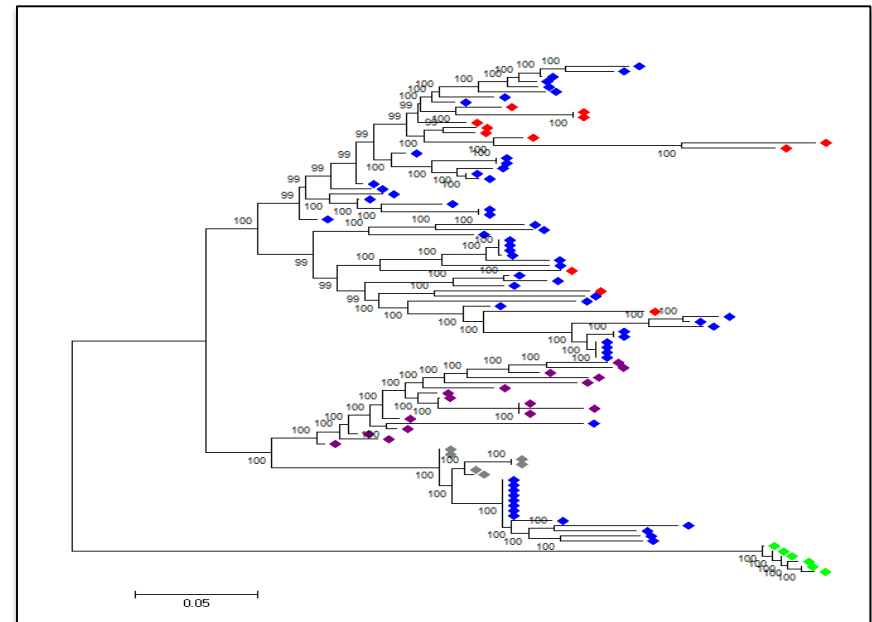
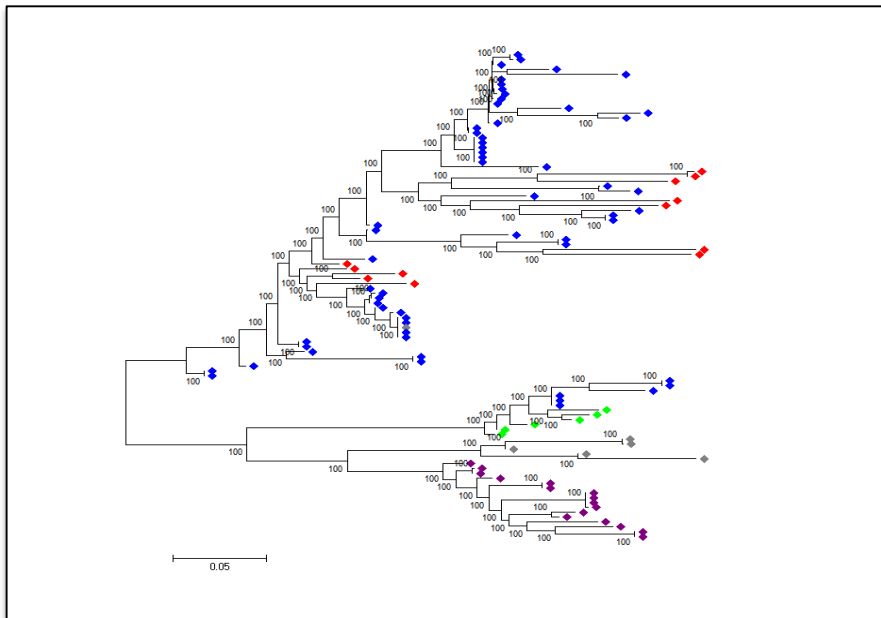
◆ Grey



◆ Red



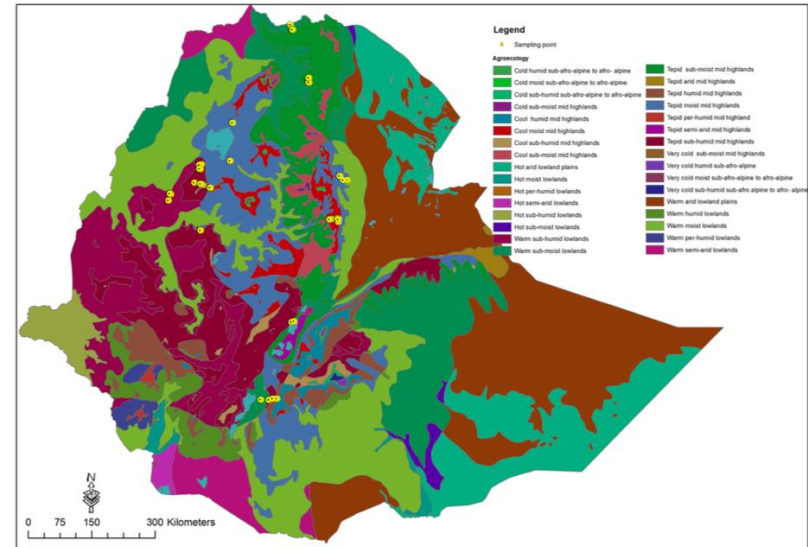
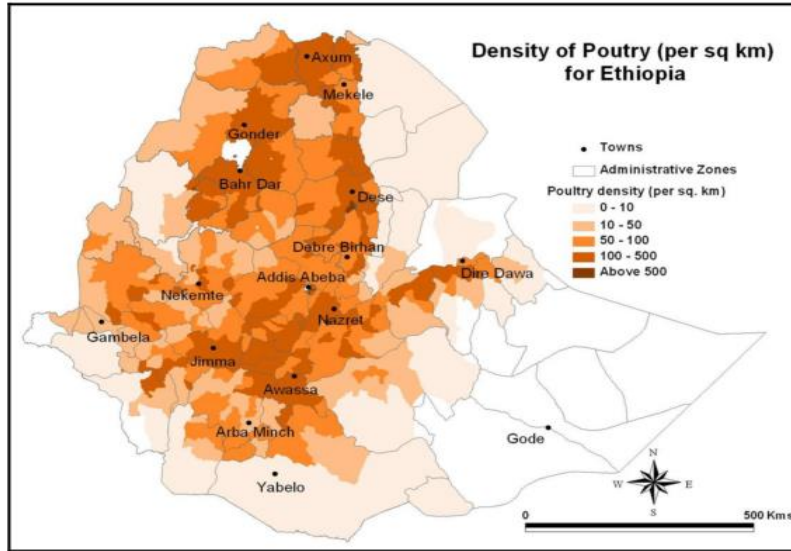
◆ Domestic



Candidate regions for autosomal introgression in domestic chicken

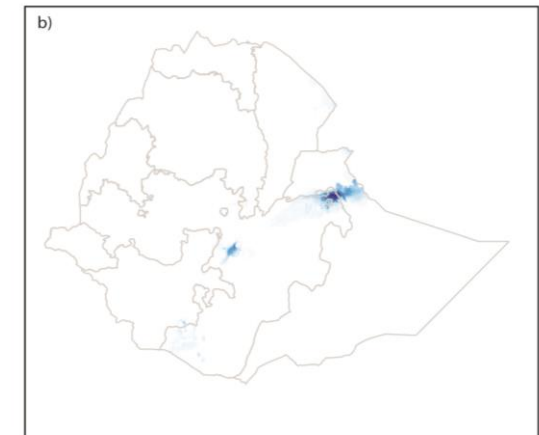
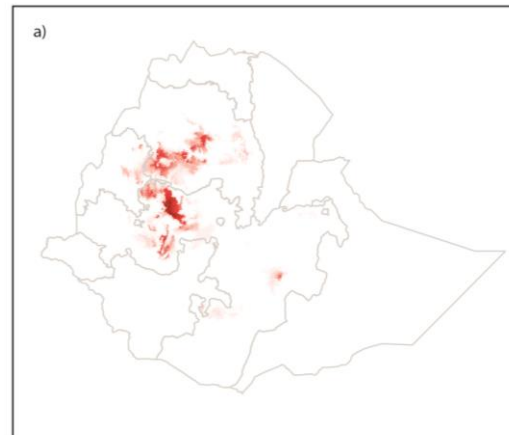
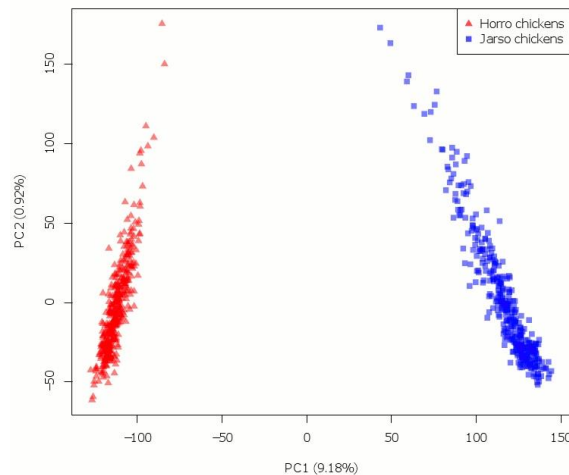
grey (n = 41), Ceylon (n = 12), green (n = 7)...

Shaping of diversity genetic drift - natural selection....

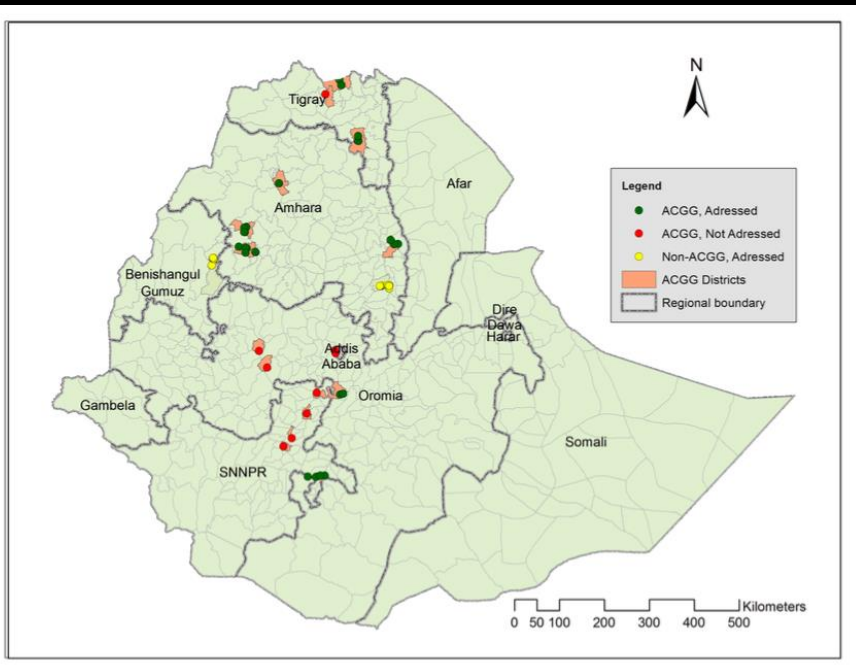


Source: Drawn based on CSA (2007) data

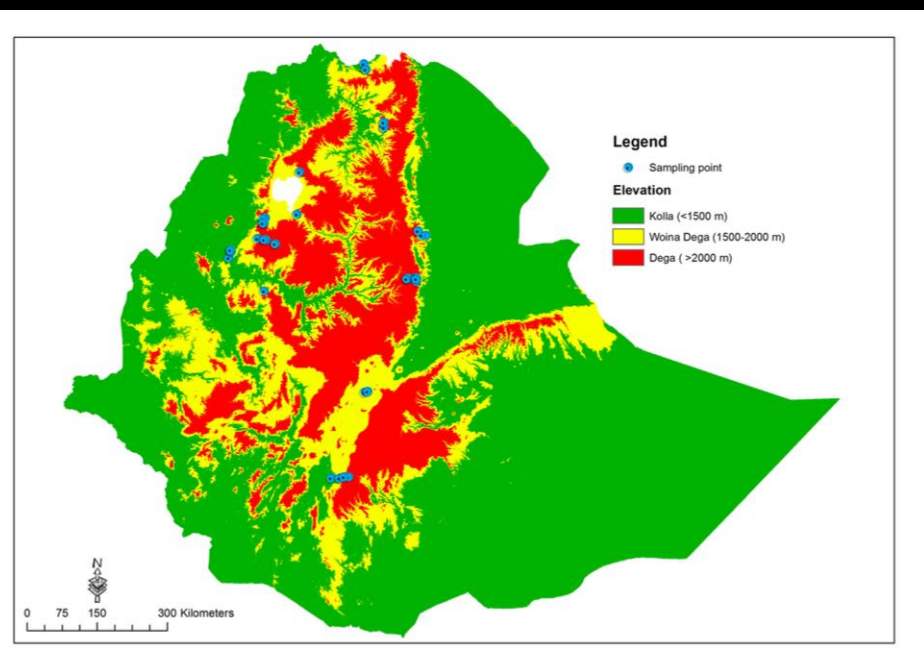
700 K SNPs chip (*Desta PhD thesis*)



Potential distributions for Horro and Jarso chicken following agro-ecological parameters



Sampling sites



Altitudinal zones



*Blood, liver, caecum
content
Sept 2016*

*n = 227, 14 districts
23 kebeles*

A woman with a purple headscarf and a blue dress is crouching on the ground, holding a small object in her hands. She is surrounded by several chickens of various breeds, including white, brown, and speckled. The background shows a rustic wooden fence and lush green foliage.

Thanks you

Photo credit: Judith Betttridge