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# Agricultural Biodiversity and Adaptation

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## Agricultural Biodiversity

- Crop and Livestock Genetic Resources for Food and Agriculture (GRFA)
  - Diversity of traits and characteristics found within and across crop varieties, crop wild relatives, domesticated livestock breeds, and wild breeds.



# Importance of Genetic Resources for Food and Ag (GRFA)

- Essential part of evolutionary processes that generate and sustain the capacity of crops and livestock to adapt to changes.
- Provide traits and characteristics relating to taste, productivity, nutrition, and the ability to withstand extreme conditions.
- For farmers in rural areas:
  - Insurance and risk management options
  - Cultural Services



## Trends Toward Loss and Degradation of GRFA

- 12 plant species provide 75% of the world's food
- 75% of plant GRFA has been lost since the early 1900s
- 62 livestock breeds went extinct between 2001 and 2007, a further 20% of currently existing breeds are at risk of extinction.

(FAO1996, 2007)



# Climate Change and GRFA

- Exacerbating the existing threats to GRFA through the initiation of a diverse range of stressors.
- Implications for GRFA, farmers, and governments:
  - Decreased meat and milk productivity in livestock
  - Decreased yields in crops
  - Increased vulnerability to pests, diseases, and extreme events
  - Shifting geographic ranges of GRFA



# Conservation and Use of GRFA

- Ex-situ and In-situ Conservation
- How do farmers use conserved GRFA for adaptation to current and future climate change? What initiatives are helping to facilitate that use, and how?



# Utilizing GRFA for Adaptation

- Focused on Smallholders
  - Community Seed Banks
  - **Seeds for Needs**
  - Participatory Plant Breeding
  - Evolutionary Plant Breeding
  - **Champion Livestock Farmers**
  - Improved Utilization of Animal GFRA
- Technological Advances/ Tools
  - **Genetic Modification**
  - **Genomics**



## Remaining Challenges

- Data collection, monitoring, and integration with climate predictions.
- Economic considerations
- Governance challenges
- Understanding GRFA and broader ecosystems



**Eskerrik asko!!**  
**Gracias!!**  
**Thank you!!**