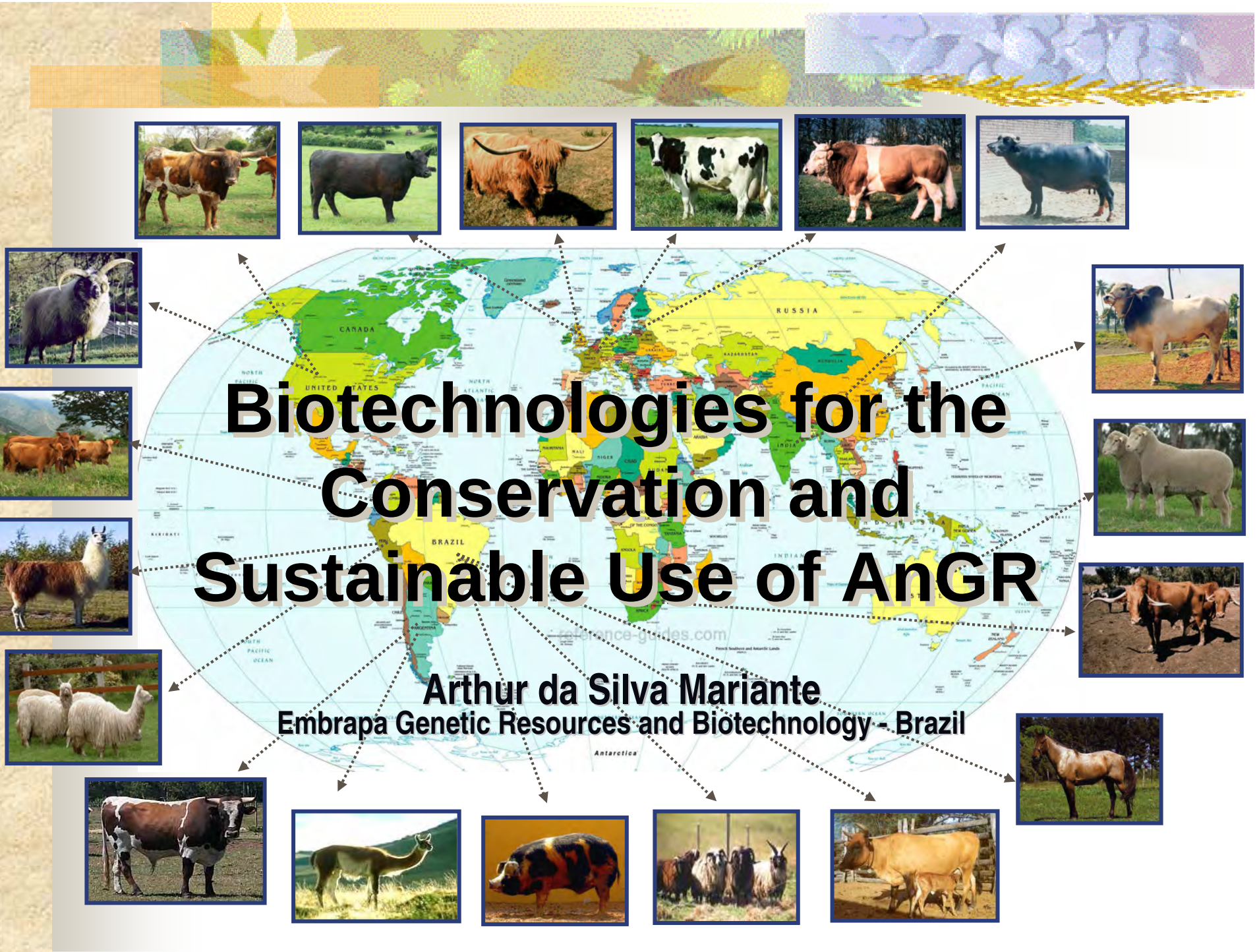
Biotechnologies for the Conservation and Sustainable Use of AnGR
Arthur da Silva Mariante
Embrapa Genetic Resources and Biotechnology - Brazil

Introduction

- The diversity of AnGR is essential to satisfy basic human needs for food and livelihood security.
- AnGR contribute to human needs by providing:
  - Meat
  - Milk and dairy products
  - Eggs
  - Fibers
  - Manure for fertilizer and fuel
  - Draught power

Introduction

- Even though their enormous contribution to reducing hunger and poverty, AnGR are underconserved and underutilized
- Most countries are highly interdependent, with respect to AnGR
- Indiscriminate crossbreeding replaced a great amount of local breeds taking them to the verge of extinction
- Today, most production systems worldwide depend on livestock originally domesticated in other regions.

Number of Local and Transboundary Breeds at Global Level, and Conservation Activities

Species	Local Breeds	Transb. Breeds	In Vivo	In Vitro
Cattle	897	93	324	225
Sheep	995	134	261	111
Goats	512	47	109	44
Pigs	541	25	120	140
Chickens	1,077	55	194	87
Horses	570	63	149	33

Biotechnologies for Conservation

- The two main areas of biotechnology for the conservation of AnGR are:
  - Reproductive Biotechnologies
  - Molecular Markers
- Both are important, but by far the reproductive biotechnologies are the most widely used

Biotechnologies for Conservation

- **Reproductive technologies**:
  - Artificial Insemination
  - Embryo Transfer
  - Cryopreservation (Gene Banks)
  - Oestrus Synchronization
  - In Vitro Fertilization
  - Sperm and Embryo Sexing
  - Cloning (?)
- **Molecular Markers**
  - Genetic Characterization

Established Gene Banks

- Cryopreservation has broadened the use of AI allowing the storage of genetic material for later use
- To preserve their local breeds, many developing countries already established Gene Banks:
  - Argentina, Brazil, Colombia, Cuba (Mexico)
  - Botswana, Tunisia
  - China, India, South Korea

Regional Gene Banks

- In 1989, FAO launched a process to establish RGBs, but health problems would difficult the movement of germplasm
- This would be a solution for small countries where the access to LN2 is difficult
- A partnership between researchers on conservation and on Animal Health would accelerate the solution o this problem

Molecular Markers

- MM are a very important tool for conservation programs
- ISAG defined MM for the different species of livestock
- Eleven countries of LAC, 8 in Asia and 4 in Africa reported the use of MM for genetic characterization.
- DNA chips developed in recent years allow to genotype tens of thousands of SNPs.
- This is an example of an international cooperation, in which developed countries would genotype the local breeds for the developing countries

Conclusions

- Even though Artificial Insemination is known since the 30's, some developing countries still do not have the necessary infrastructure and capability
- Capacity building is extremely important, but people that would really do the field work is the one that should be trained
- Financial resources should be mobilized to develop projects to genotype local breeds
- South-South cooperation should be stimulated
- In the future, creation of Regional Gene Banks


Thank you!