The Philippine Carabao Center -Animal Genetic Resources (AnGR's) Cryobanking Initiative

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Philippine Carabao Center's Mission :

To conserve, propagate, and promote the water buffalo

: important source of milk and meat

: towards better nutrition

: higher levels of income, and

: improved general well-being of the rural farming families…

The Philippine Carabao Center:

- started as an UNDP/FAO-assisted project "*Strengthening of the Philippine Carabao Research and Development Center*" coordinated by PCARRD from 1982 to 1992
- by virtue of RA 7307, otherwise known as the Philippine Carabao Act of 1992 and PCC became operational in 1993 as an attached agency of the Department of Agriculture
- an Integrated Mgt. System-certified government agency: 2012

  (QMS: 19001:2008), (EMS:14001:2004) , (OSH: 18001:2007)
- **lead agency in Livestock Biotechnology in the Department of Agriculture**

LIVESTOCK AND POULTRY AGRICULTURE ENSURES GLOBAL FOOD SECURITY

Population growth

2014World Population

Asia : 4.2 B
Africa : 1 B
Europe: 740 M
North America : 546 M
South America : 396 M
Oceania : 37M
Antarctica : 4,490

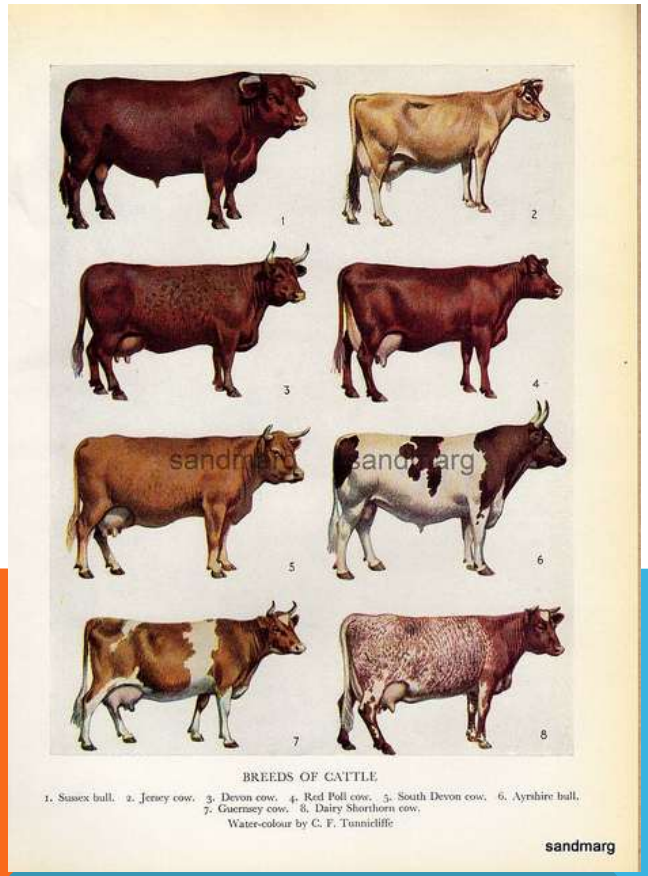
Total 7.1 Billion

Increased demand for food

Pressure to increase livestock and poultry production efficiencies

Increased in selection intensity of selected breeds

Contractions in livestock genetic diversity



Intensified agricultural development

Habitat fragmentation : habitat loss

species-poor managed ecosystems

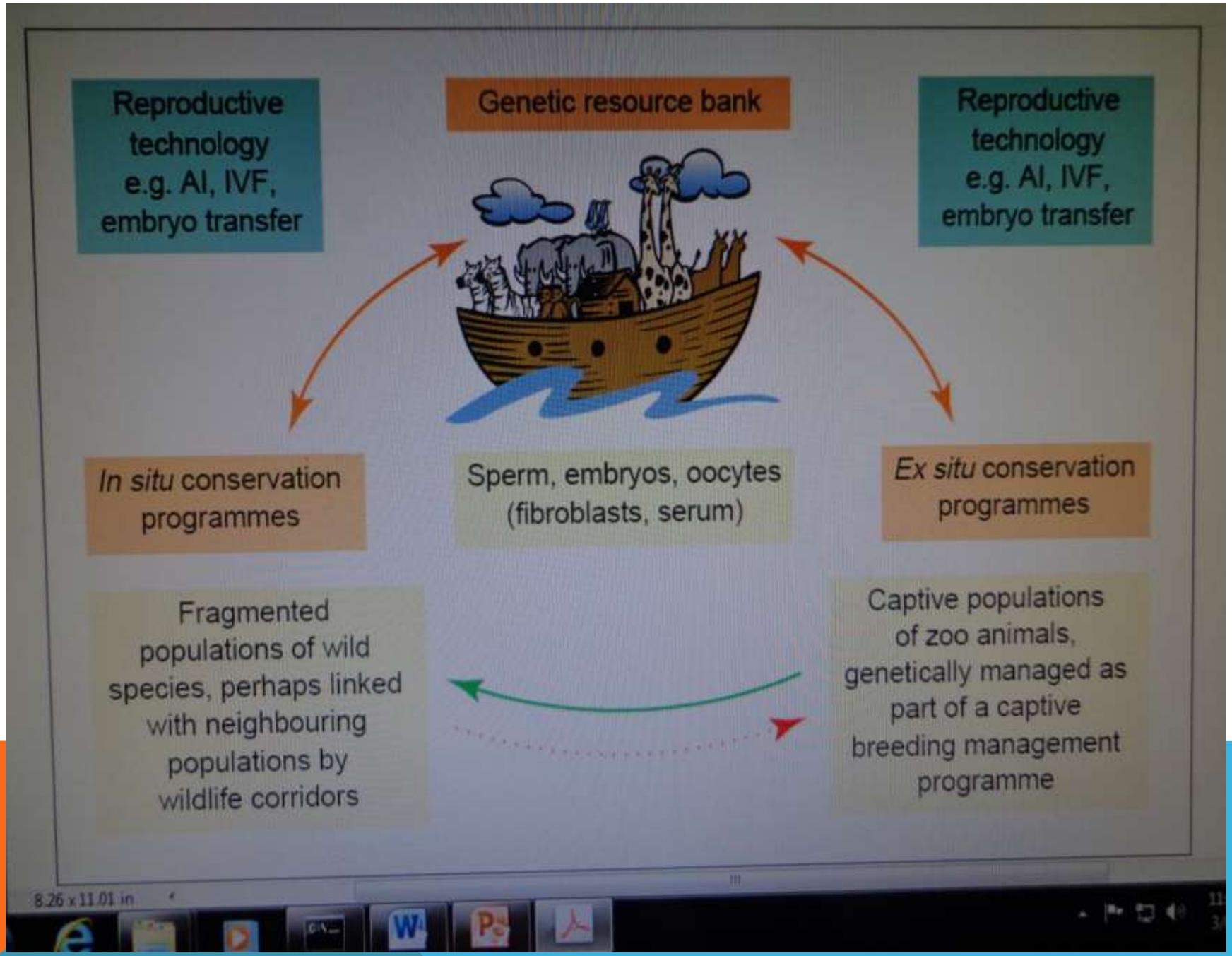
Industrialization,
greenhouse emissions
Increased urbanization,

Displacement of wildlife,
restricted range spaces
to find mates;
inbreeding depression

FAO- Global Plan of Action Animal Genetic Resources (AnGR's)

Conservation, Utilization, and Development of AnGR's

National AnGR's Cryobank Repositories


Reproductive technology e.g. AI, IVF, embryo transfer
Genetic resource bank
Reproductive technology e.g. AI, IVF, embryo transfer
In situ conservation programmes
Sperm, embryos, oocytes (fibroblasts, serum)
Ex situ conservation programmes
Fragmented populations of wild species, perhaps linked with neighbouring populations by wildlife corridors
Captive populations of zoo animals, genetically managed as part of a captive breeding management programme

Cryobanking initiatives worldwide …..

Prevent imminent loss of farm animal genetic biodiversity

Global Conservation strategies for heritage breeds, traditional breeds, disease resistant breeds and animals well adapted to climate changes

PRACTICAL APPROACHES:

- Natural habitat conservation (in situ-in vivo approach)
- Captive breeding programs (ex situ in vivo approach, zoo)
- In vitro cryo-conservation strategies (cryopreservation approach)

PCC-Cryobank Facility

Philippine Carabao Center –AnGR Cryobank Facility

Establish and Implement an Animal Genetic Resources (AnGR's) Cryoconservation program in the country

Molecular characterization cryo-conserved AnGR's (genotyping, genetic screening)

Establish a National Databank for Cryopreserved Animal Genetic Resource Material (genebank and DNA Library)

Enhance linkages/collaboration with animal conservation groups

1. Philippine Native Animal Development,
2. Livestock Breeders Association,
3. Wildlife Conservation Groups

Collaborative research partnership with:

1. Animal Geneticists,
2. Reproductive Physiologists,
3. Life Science Researchers

for the common goal of

"***preserving animal genetic biodiversity***"

CRYOBANKING

Capitalizes on Cryopreservation technologies such as:

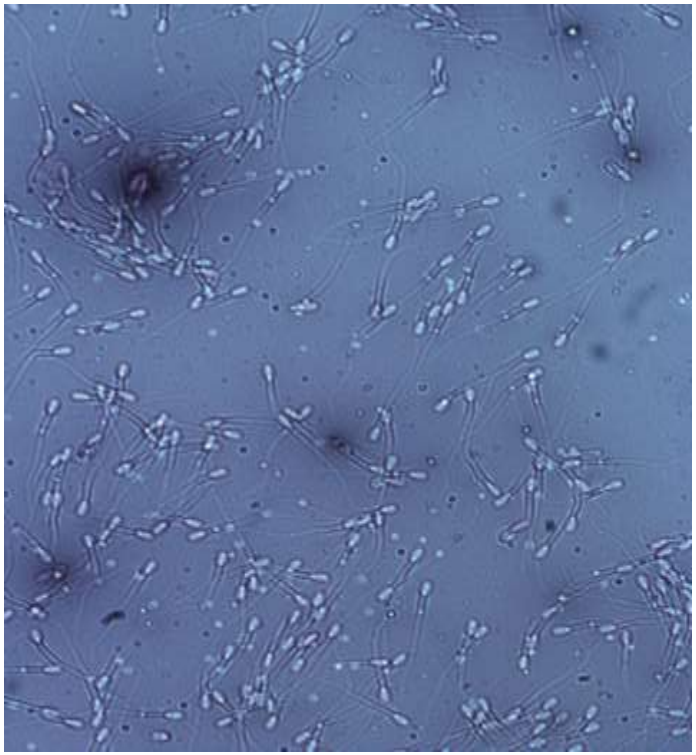
- conventional slow freezing techniques
- vitrification technology for egg cells and embryos
- Liquid nitrogen storage

Sources of cryopreserved germplasm:

Male gametes (water buffalo, cattle and goats)

1. **PCC water buffalo semen production centers**
   a. **PCC-CLSU Ranch (Bull farm)**
   b. **PCC- UPLB (Bull farm)**

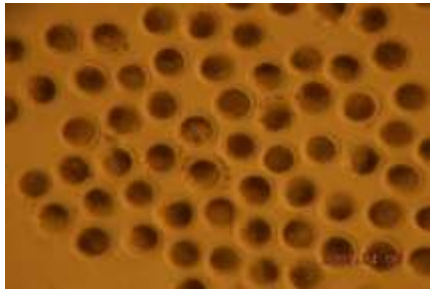
2. **Bureau of Animal Industry**
   a. **Nueva Ecija Stock farm (Luzon)**
   b. **National Animal Breeding Center (Mindanao)**



B. Egg cell and/or Embryo preservation

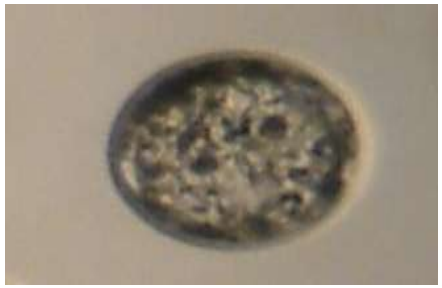
Oocyte Cryopreservation for Egg cell banking

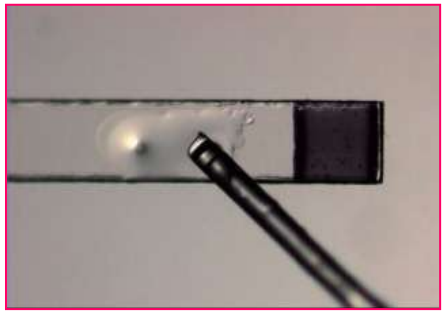
Immature eggs



Matured eggs

Oocyte/ Embryo Vitrification in cryotop





PCC- Cryo-conservation Targets

Pedigree and performance tested animals

Indigenous/native species of animals

Bukidnon Farmer with her Native Cow

Bukidnon Native Cattle

Philippine native carabao with a calf

Philippine native pigs (PNAD)

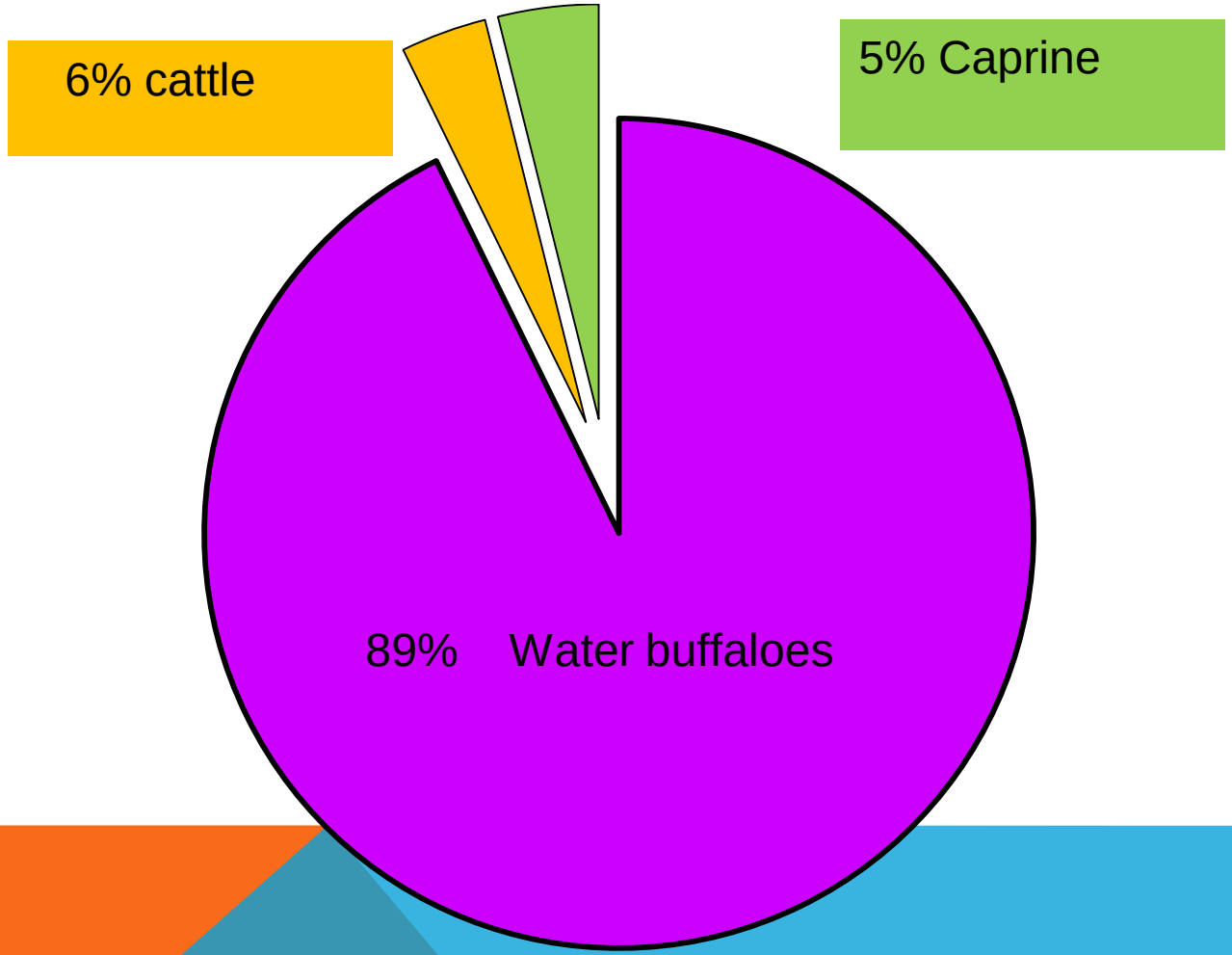
Endemic wildlife species

Population status as of 2012
327 heads

Philippine Tamaraw
Bubalus bubalis mindorensis
IUCN- critically endangered
300 kg in weight,
4 feet tall,
Distinct V-shaped horn
Four national laws protect it from poaching – Commonwealth Act 73 plus Republic Acts 1086, 7586 and 9147.

Cryotanks for the cryostorage of AnGR's

What we have right now at the Cryobank



Thank you for kind attention

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