



Food and Agriculture Organization
of the United Nations

Challenges for livestock breeding in developing countries

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Food and Agriculture Organization of the United Nations



IMPLEMENTING THE GLOBAL PLAN OF ACTION FOR ANIMAL GENETIC RESOURCES

Main source of information: The Reports on The State of the World's Animal Genetic Resources



What is animal breeding?



- Animal breeding involves the selective breeding of domestic animals with the intention to improve desirable (and heritable) qualities in the next generation (Kor Oldenbroek and Liesbeth van der Waaij, 2015).



- There is no breeding without a predefined goal
- Keeping animals and reproducing them without selective breeding is NOT animal breeding



Why animal breeding is important

- Together with feeding and husbandry, main pillar of production improvement and adaptation to changing environmental conditions (CC, consumer demands...);
- Most of the genetic improvement is comparatively permanent;
- Means to maintain/increase profit, use input resources more efficiently and improve product quality, food safety and animal health.



Is animal breeding important?



Is animal breeding important?

- Yes, BUT do countries need national breeding programmes?

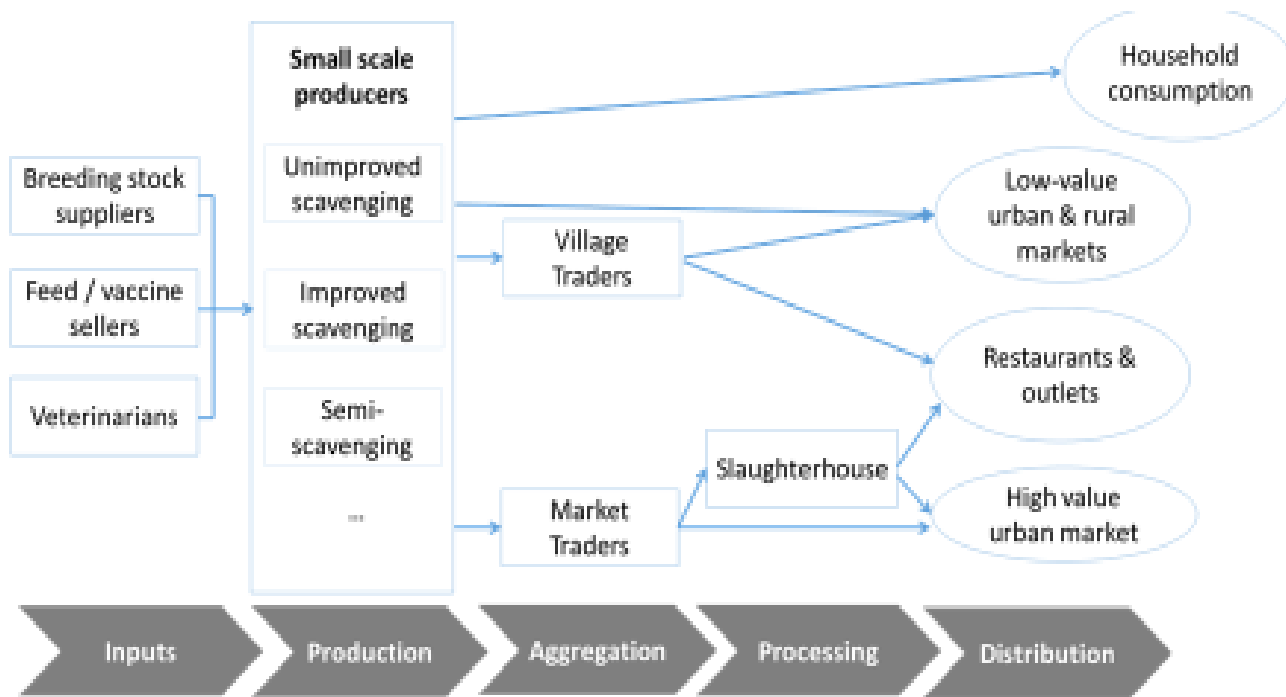


Is animal breeding important?

- Yes, BUT do countries need national breeding programmes?
- Livestock development policy is indispensable before formulating a breeding policy!
- Livestock development objectives (LDOs) must be elaborated first.
- Livestock development strategies to achieve the LDOs typically use 5 components: breeding, feeding, health care, husbandry and marketing.
- The contribution of those will depend on the LDOs and the development opportunities within the specific production systems.



Is animal breeding important?



Chicken egg and meat value chain

Different production systems, different channels, different markets...



What makes breeding programmes successful?



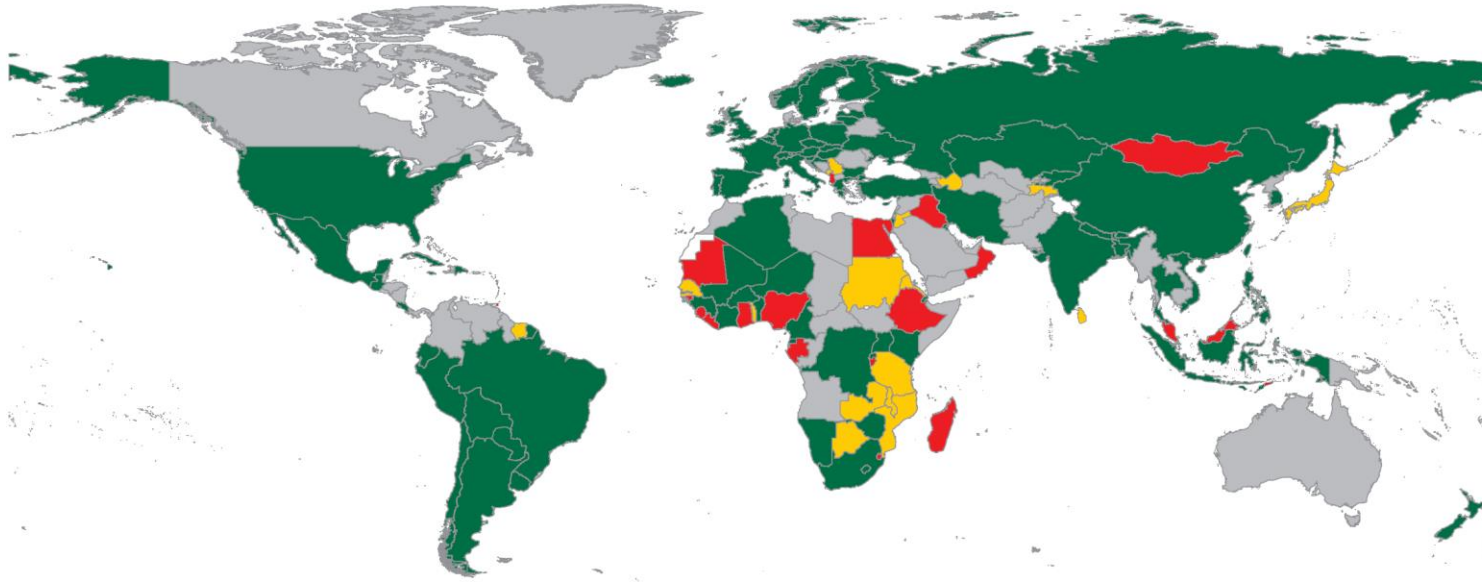
Global situation of animal breeding

- In August 2013, FAO invited its 191 member nations to submit country reports on their management of AnGR;
- A total of 128 reports have been received (30 from OECD; 98 from non-OECD)
- Reports included a section on implementation of livestock breeding programmes and capacity to implement them



Global situation of animal breeding

Involvement of breeders' associations in breeding programmes and elements of breeding programmes



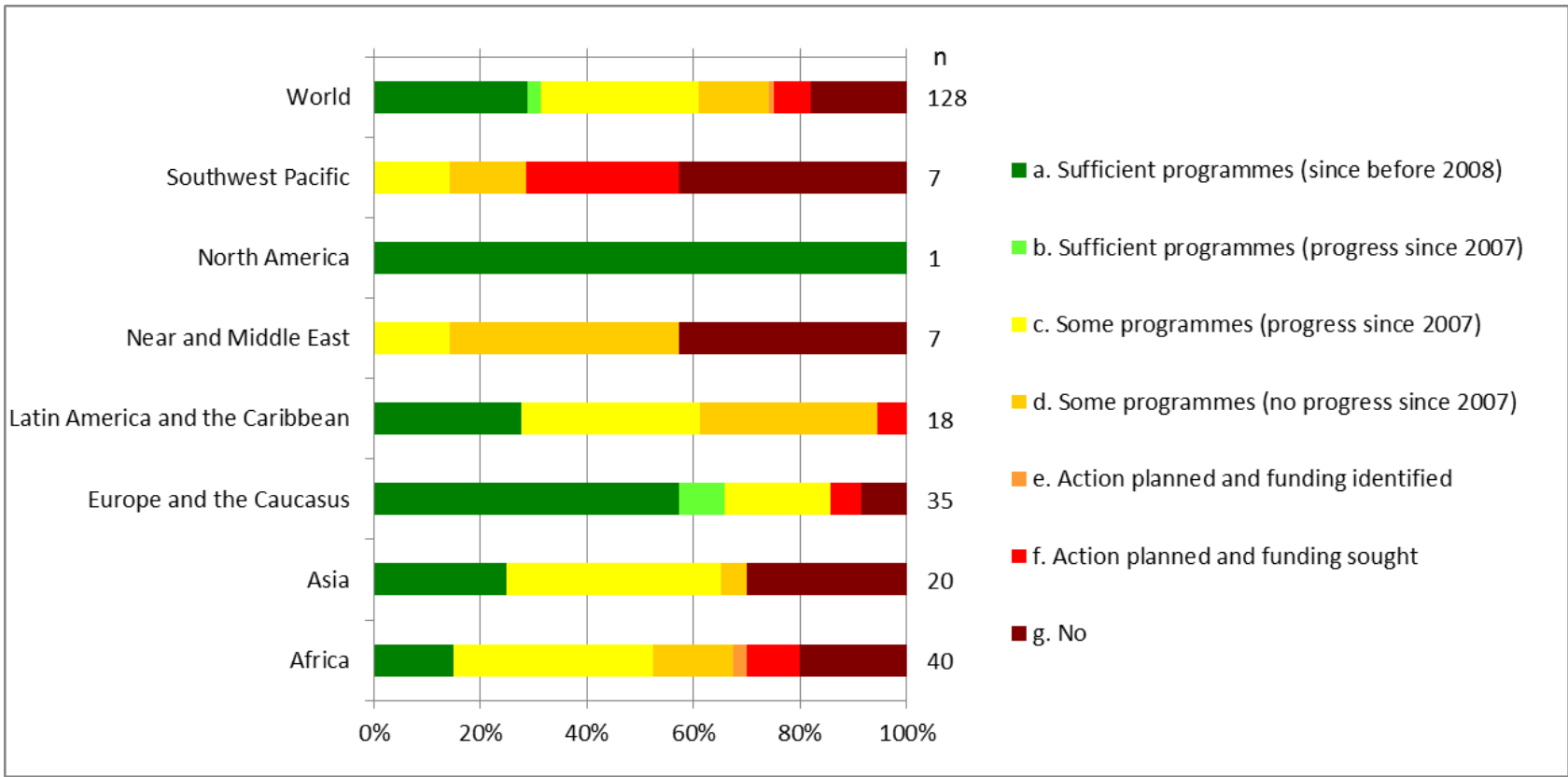
- Countries reporting that breeders' associations operate breeding programmes for at least one species
- Countries reporting that breeders' associations are involved in some element of breeding programmes for at least one species
- Countries reporting no involvement of breeders' associations in breeding programmes
- Countries that did not report

Source: Country reports, 2014.



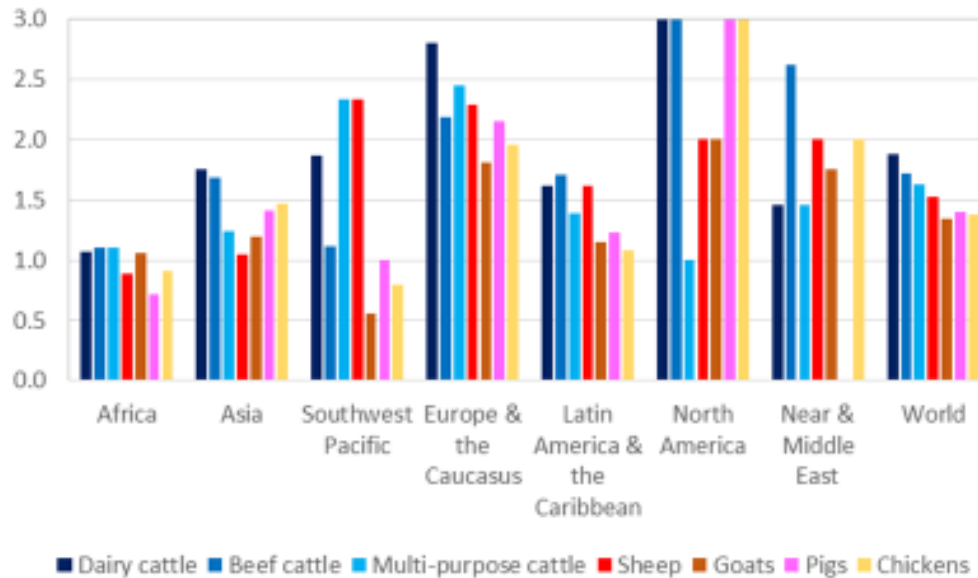
Global situation of animal breeding

Have training and technical support programmes for breeding activities of livestock keepers been established/strengthened in your country?



Global situation of animal breeding

State of research in the field of animal breeding



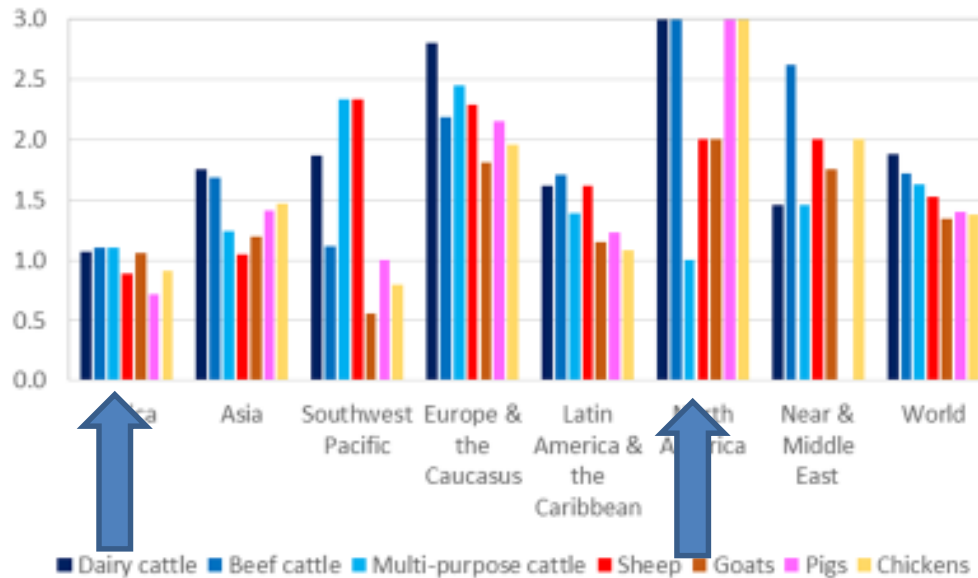
Note: Each country provided a score for the level of provision with respect to each species. The scores were converted into numerical values (none = 0; low = 1; medium = 2; high = 3)

Source: SoW2 Country reports, 2014.



Global situation of animal breeding

State of research in the field of animal breeding

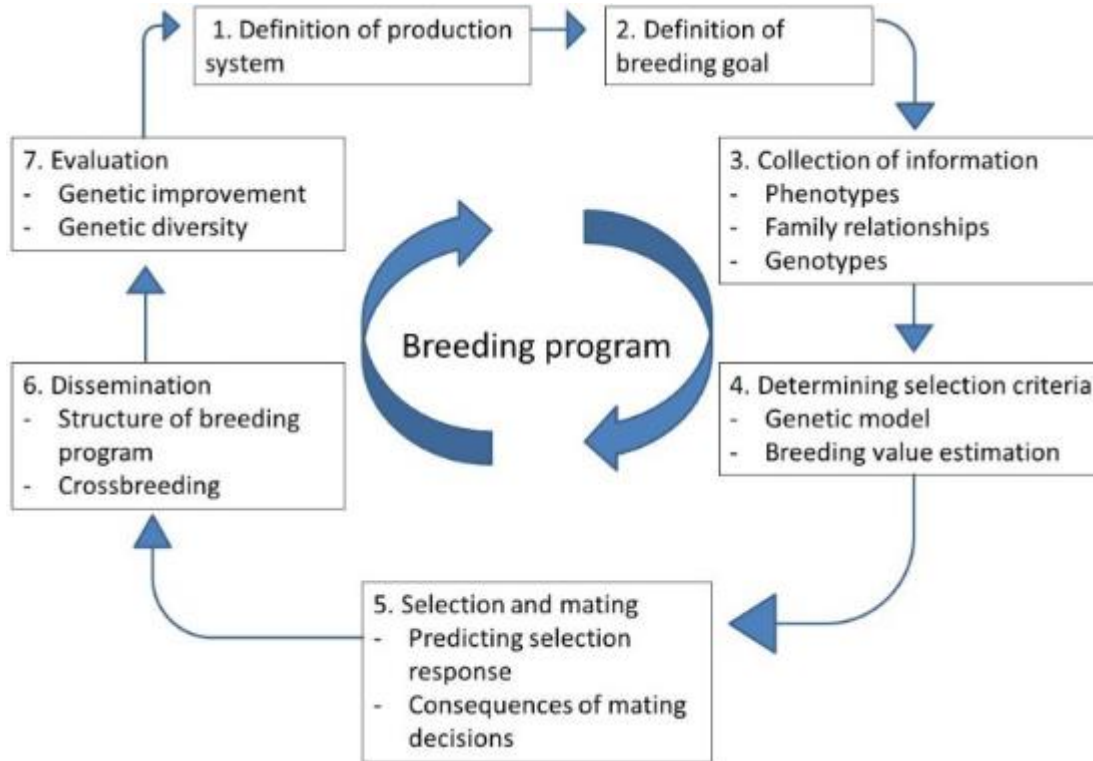


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Elements of a breeding programme?

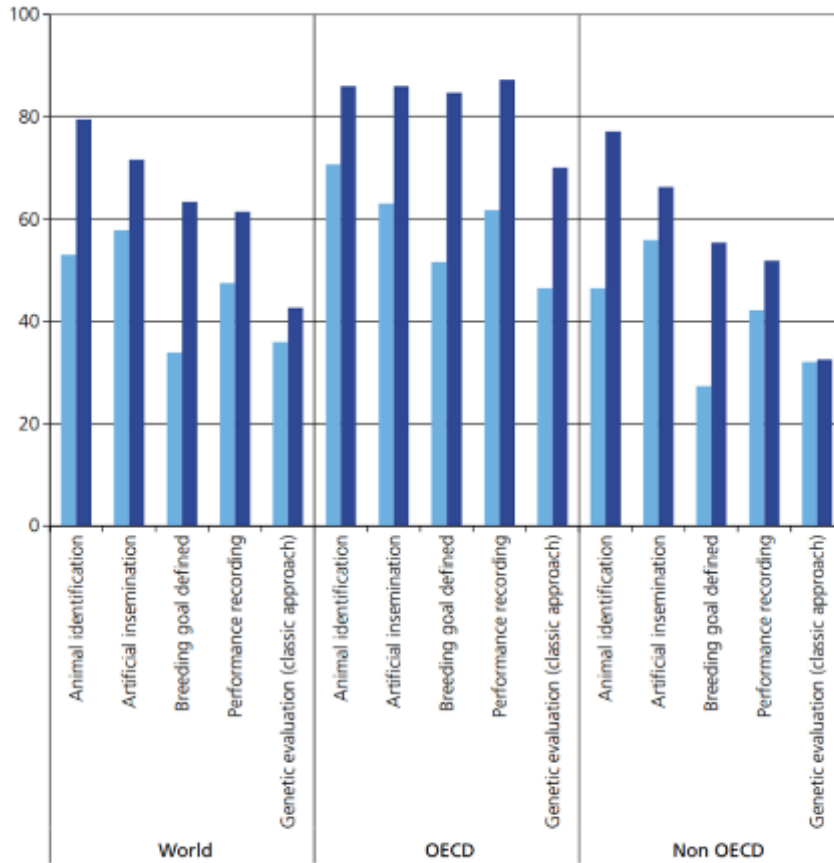


Source: Kor Oldenbroek and Liesbeth van der Waaij, 2015



Global situation of animal breeding

Percentage of cattle breeds (national breed populations)



Implementation of elements of breeding programmes in cattle (2005 and 2014)



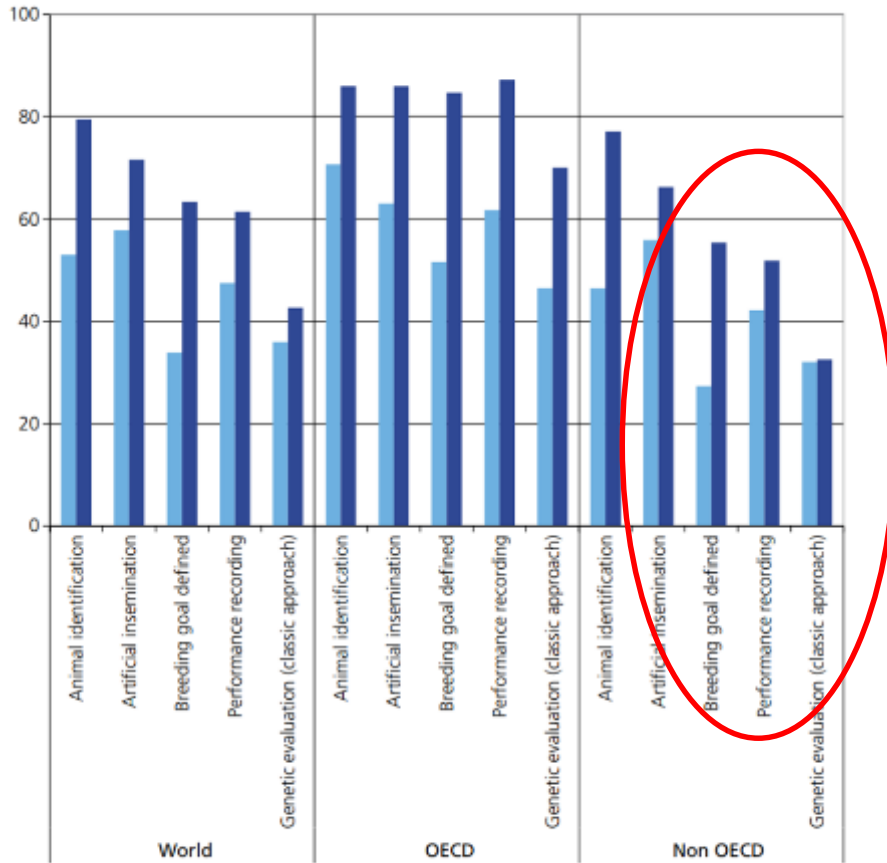
Note: The figure is based on information reported by the 35 countries (9 OECD and 26 non-OECD) that provided the relevant information in both State of the World (SoW-AnGR) reporting processes. The figures represent the percentage of cattle breeds (national breed populations) in which the tools are used. Note that they may be used only in part of the population within these breeds.

Source: SoW1 and SoW2 Country reports, 2007-2014.



Global situation of animal breeding

Percentage of cattle breeds (national breed populations)



Implementation of elements of breeding programmes in cattle (2005 and 2014)



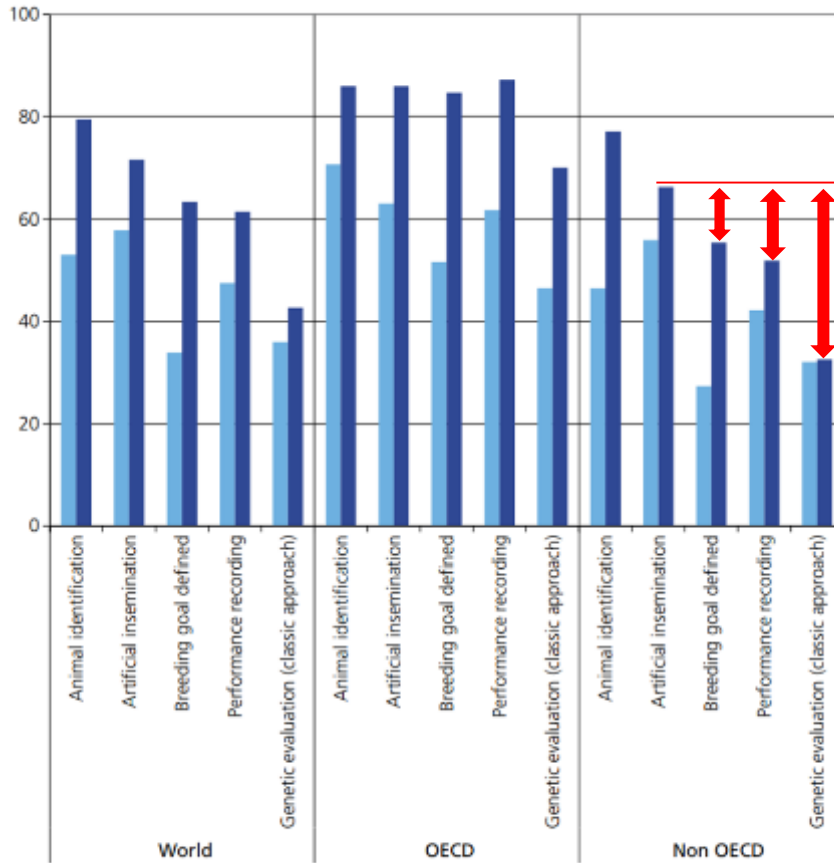
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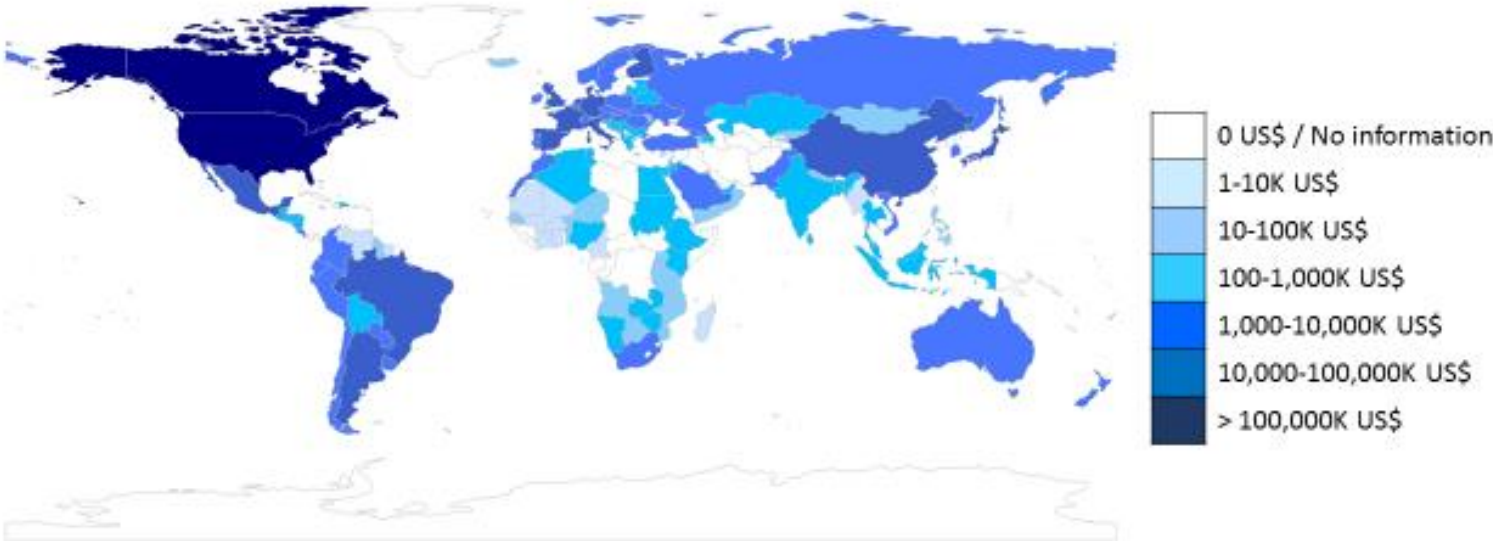
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Global situation of animal breeding

World trade of bovine semen (import and exports aggregated)



Source: UN-Comtrade (averaged 2013-2017)

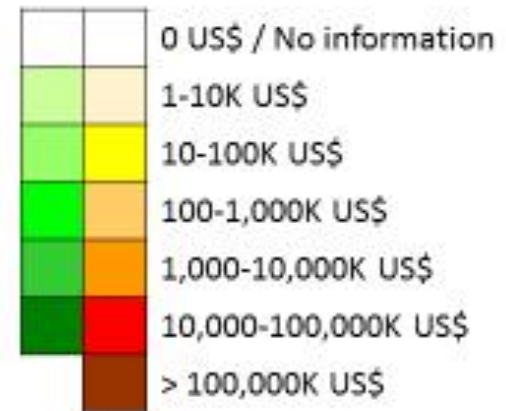
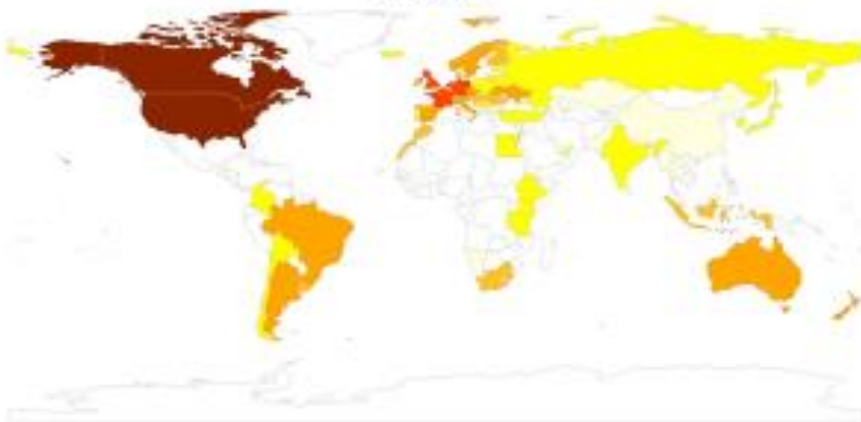


World trade of bovine semen (import and exports)

Imports



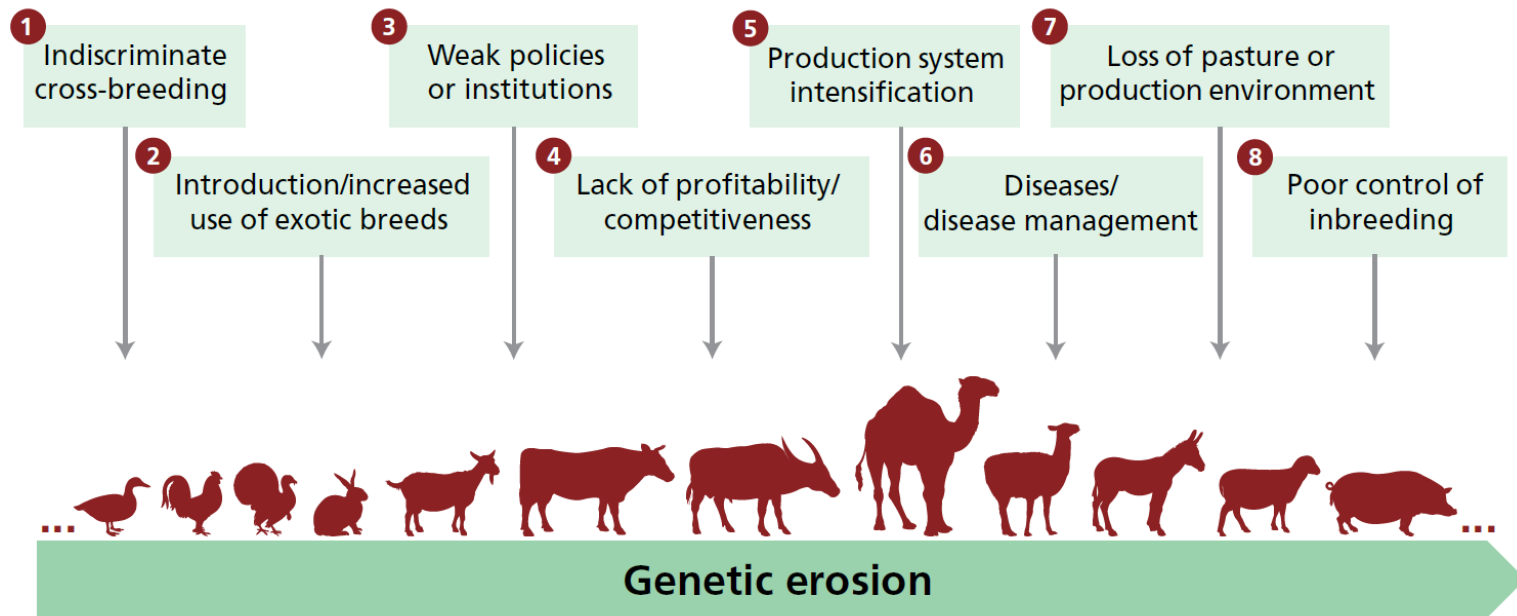
Exports



Source: UN-Comtrade (averaged 2013-2017)



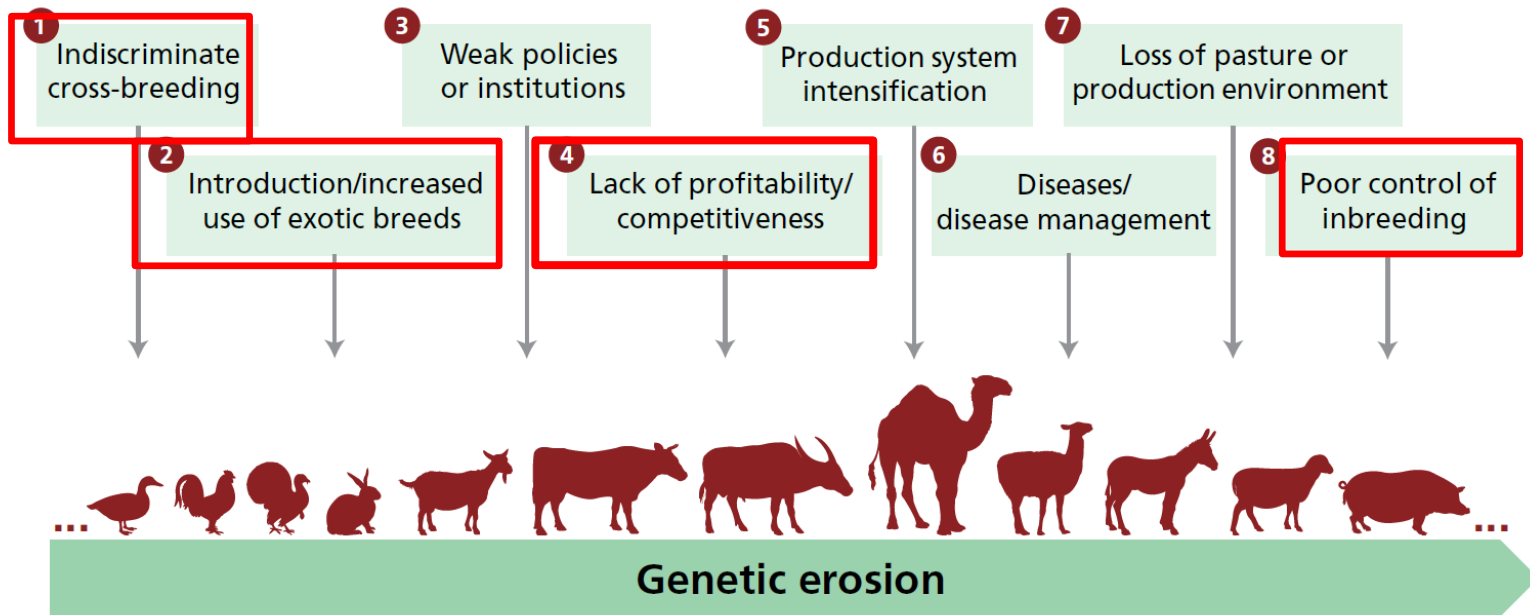
8 main threats to the diversity of AnGR



Source: FAO (2014)



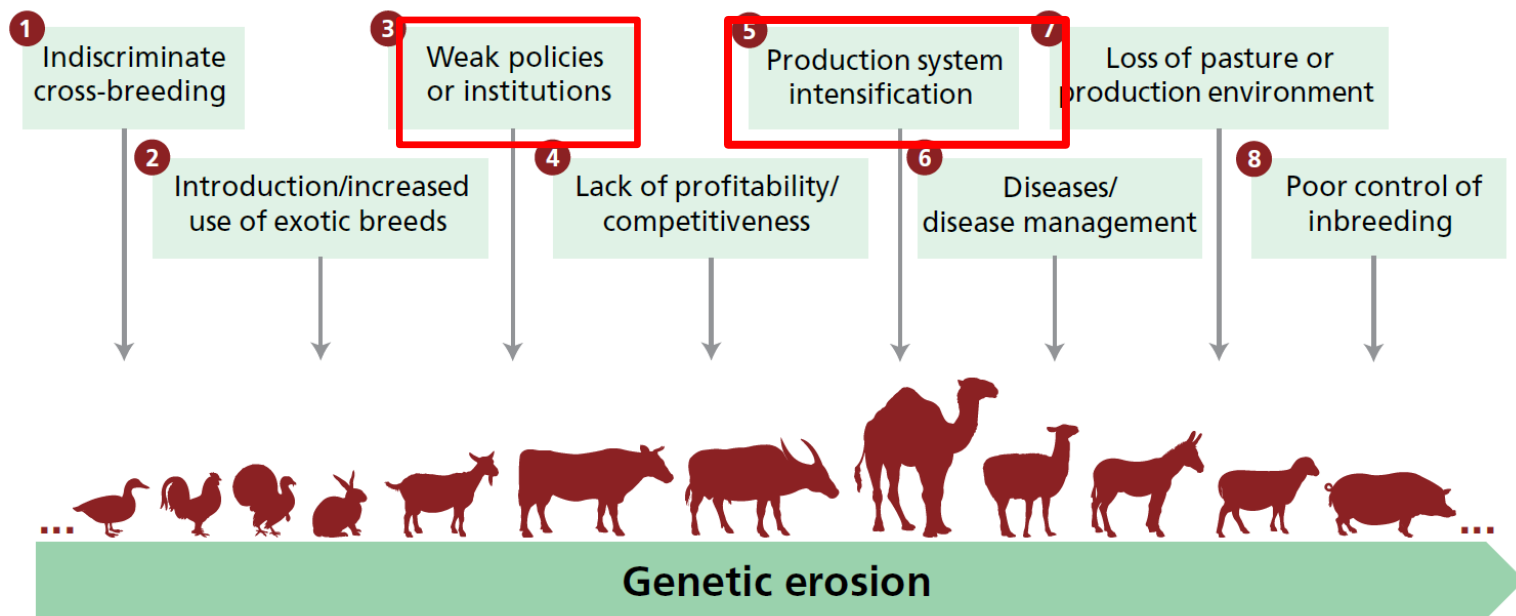
Main threats to locally adapted breeds related to a **lack of breeding activities/strategies**



Source: FAO (2014)



Main threats to locally adapted breeds having direct implications on breeding activities/strategies



Source: FAO (2014)



Conclusions and priorities

- Majority of developing countries report to have some elements of breeding programmes in place, BUT reported level of implementation suggest that these are no organized breeding programmes.
- The involvement of stakeholders in organization and implementation varies greatly between regions (governments are main players in Africa, Asia Near and Middle East – breeders' associations and private companies in developed countries)



Conclusions and priorities

- Livestock-keeper organisations frequently remain poorly developed, as do education and training in the field of livestock breeding.
- Many developing countries have put policies in place aiming at improving the state of livestock breeding, BUT in many developing countries focusing on the introduction of exotic breeds for cross-breeding.
- While increasing the availability of exotic genetic material may be relatively straightforward, ensuring appropriate use is challenging.



Conclusions and priorities

- Countries recognize the need to take advantage of their locally adapted breeds (CC, ongoing need for breeds suitable for small-scale producers and in low-input production systems).
- Only small number of developing countries report successful establishment of community based breeding programmes.
- Animal identification is area with most progress probably because of its multiple roles with regard to livestock development.



Conclusions and priorities

- Countries often have to deal with a diverse range of production systems making identification of specific priorities at national and production-system level complex.



Lessons learnt: What makes a breeding programme successful

<http://www.fao.org/docrep/012/i1103e/i1103e00.htm>



Lessons learnt – exotic breeds

- Introduction of highly selected breeds is only effective with levels of inputs similar to those provided in the countries of origin.



- Reproduction rates among introduced breeds and their crosses are often poor.
- Their survival rates and longevity are often poor.



Lessons learnt – breeding goals

- Identifying the best genetics (providing most benefits for the livestock keeper communities) must take differences among production systems into account (differences within country but also between developed and developing countries).
- Full consideration must be given to the uses to which livestock-keepers put their animals (multiple-purpose versus specialized breeds)
- Breeding goals and strategies must reflect these uses. Developed countries' breeding goals might be unsuitable.
- Countries 'strategies may need to focus on already well adapted breeds and on livestock keepers 'goals.



Lessons learnt – holistic approaches

- Life-cycle efficiency is key – locally adapted breed might be better than exotic ones especially when considering multifunctionality.
- Development strategies failed because associated extension and communications focused on technical issues and only men, neglecting the wider production system and women's role.



- Avoid repeating past mistakes, consider all aspects in the local context !



How to avoid failures? What needs to be done?

- Strengthen technical and operational capacities to evaluate range of AnGR, production systems and strategies and options for their development



- Before adopting policies, assessment of long-term implications is needed, including at the value chain level
- Livestock keepers have to be involved adequately in the early planning and development of breeding programmes



How to avoid failures? What needs to be done?

- Genetic improvement programmes need to be documented allowing a clear understanding of objectives and responsibilities.
- Short term projects are not sufficient for implementation of successful breeding programmes – long term, evolving strategies involving public and private sectors can be highly successful.
- Animal identification, pedigree and performance recording need to be expanded to take advantage of traditional approaches to breeding (let alone genomic selection). DATA, DATA, DATA....(innovative approaches of data management?)





Thank you for your attention



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