Pig genetic resources, livelihoods, progress & prospects

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A brief digression to address the intro

- Prof Dannie Brink
  - Restrictions
    - Knowledge and information – we are restricted by what we know
      - That includes everybody – researchers, policy makers, value chain actors
    - Resources – we are restricted by what we have
      - That includes…
  - The conundrum of moving from subsistence agriculture to commercial agriculture through developmental agriculture
    - The recognition that subsistence & commercial oriented farmers are not the same 'species' irrespective of landholding (that's my version)

PRODUCTION SYSTEMS

Pig production systems

- The usual dichotomy (is it continuum?)
  - Resource – limited smallholder subsistence systems
  - Intensive highly – resourced market – oriented systems
  - In Africa the resource – limited smallholder subsistence systems have proven to be more resilient and sustainable compared to commercial set-ups
  - Counterintuitive but:
    - Lower fixed costs and inputs compared to intensive production
    - Access to kitchen waste that can be used to supplement a few scavenging pigs
    - Pigs having other functions in traditional systems that make their production worthwhile
  - Note that the same factors that make the systems **resilient** are also the major weaknesses
    - They provide strong buffering effects in either direction

Pig ownership patterns

- Mainly women and children
  - Kinship networks that lead to spread of ownership within gender
  - Easy to keep and will not overburden or compete with the 'reproductive economy'
  - Can be left to free range with minimum supplementation from household waste
  - Easy to keep and free range are good but:
    - Easy to keep usually translates in into low investment of time, inputs and other resources
    - Poor biosecurity and vulnerability to disease
    - Lack of market orientation
    - Lack of product quality assurance

Smallholder competitiveness

- Why the smallholder?
  - They are the custodians of most of the genetic diversity and hence the adaptive capacity
- Competitiveness low because of the various constraints
  - Feeds and feeding
  - Biosecurity
    - Diseases & parasites
    - Food safety & quality assurance systems
    - Highly wasteful – high piglet mortalities
  - Housing
  - Markets and market intelligence
  - Few pigs per household (to match numbers to resources) hence low marketable surplus
  - Policy gaps
  - Genetics
  - Lack of farmer organisation

What do smallholders get?

- Benefits
  - Employment
  - Household income
  - Insurance
  - Contribution to food security and dietary diversity
  - Socio – cultural roles (unfortunately there are also strong taboos associated with pigs in Southern Africa

Attributes

- There are well documented attributes of pig genetic resources in Southern Africa
  - Can be exploited by both smallholders and large scale growers – differently
  - Behavioural and adaptive traits
    - Disease and parasite tolerance
    - Foraging ability
    - Herdability
    - Mothering ability
    - '…survive in harsh low-input environments and thrive under heavy disease, parasite and nutrition challenges'
    - Suitability for cultural roles

Consequently

- Traditional breeders and farmers have different breeding objectives
  - Traits of economic importance (well of immediate value anyway) vs adaptive traits
    - Aesthetic (clour and patterning)
    - Behavioural aspects (temperament, mothering ability, foraging behaviour, herdability and any other aspects that minimise labour on livestock)
    - Adaptability and the ability to survive on minimum care
  - There is also the issue of different production objectives
    - Why do smallholders keep the livestock they keep & why those breeds?

TOWARDS SUSTAINABLE USE

A recap of where the problems are

Value chain actors	Constraints
Inputs and services	Expensive feeds, No quality assurance systems, Lack of support services, Policy weaknesses
Production	High disease burden, Poor quality feeds, Lack of technical expertise, Low capacity etc
Collection & bulking	Largely non-existent, High transaction costs, Poor handling during transport
Slaughter	Largely at farm or roadside, Lack of certification
Processing	Non - existent
Retail	Very little to non - existent
Consumption	Stigmatisation of local genetic resources obviously also linked to lack of certification

Breed improvement

- Traditional and new tools
  - Indigenous knowledge systems and farmer objectives
  - Nucleus breeding schemes
  - Sire rotation and loan schemes
  - Assisted reproduction technologies
  - Genomics
    - We need t begin mapping these traits to particular loci to:
      - Better understand them and the way they have evolved
      - Manipulate them especially when we want to introgress them to other genetic resources
      - Making decisions about repopulation in the event of disasters (match the animal to the environment)

Addressing production issues

- There is need for access to:
  - Good quality & cost – effective inputs
    - Feeds, breeds, veterinary support
  - Extension services
    - Training & information
    - Role of ICT
  - Markets
- Need to re-orient farmer objectives
  - By adding the market component

Developing markets

- Investing in infrastructure and institutions
  - Market access is both a cause and a consequence of development
- Farmer organisation
  - Collective action enables farmers to access markets while reducing transaction costs of purchasing inputs, market information and new technologies
- Policy interventions
  - Support the conservation, utilisation and improvement & market presence of the neglected breeds
- Development of products and markets
  - Niche markets, culinary advocacy & branding
  - Contract farming
  - Cooperatives to enable bulking & exploitation of economies of scale

Conservation strategies

- Development of markets is closely linked to *in situ* conservation strategies – why?
  - Directly benefits the farmers and can allow shift from subsistence to commercial production or at least achieve a stage of developmental agriculture
  - Allows the genetic resources to adapt to the environment
- Backup – *ex situ in vitro* & *in vivo* conservation
  - Conservation herds
  - Cryoconservation
- Highlight
  - Africa lagging behind on SDG indicators 2.5.1 & 2.5.2 which are Tier 1 or core statistics

CONCLUSIONS & OTHER MUSINGS

Conclusions

- Characterisation, inventorying and use of pig genetic resources in Southern Africa are still incomplete
  - Information available is fragmentary and not coordinated
- Pig production is constrained by lack of resources
  - However, smallholder free-range systems seem to be more resilient and sustainable despite the lower inputs and biosecurity measures
  - Unfortunately this buffering effect works both ways
- Most pigs are owned by women which makes them an important stakeholder in any policy interventions

Conclusions

- Development of markets (complemented by well-planned *ex situ* conservation strategies) is the easiest route towards in situ conservation of pig genetic resources
  - Still meet the farmers' needs & production objectives
- There is need for breed improvement without loss of genetic diversity
  - Incorporate IKS and farmer objectives
  - Smallholders have much more multifaceted breeding objectives that include aesthetic, behavioural, suitability for religious or cultural roles and adaptive traits
- There is a need for a coordinate regional policy framework that is backed by adequate resources

THANK YOU