Managing rangelands in arid and semi-arid areas: Options for raising productivity under a changing climate





AgriConsult Namibia, agriconsult@iway.na

**Axel Rothauge** 



#### Namibia's dualistic agricultural economy

< 5% of GDP



20% from subsistence-"oriented" communal sector 650 mm 80% from profit-, export-oriented commercial sector 70% from livestock ranching and pastoralism > 50% of Namibians earn a living from agriculture

#### Agro-pastoral communal sector:

55% of people (2.5 million, <1 - 3 - 80 people/km<sup>2</sup>) 300,000 smallholder farmers work 41% of the land 60% of cattle, 75% of goats, 25% of sheep veterinary cordon fence prohibits livestock exports "no" market, poor infrastructure, low production herd maximation: only 4.4% - 8.1% - 16.5% turnover multiple-use livestock produces only 1.7 kg beef/ha insecure land tenure: not bankable, not credit-worthy hardly involved in decision-making

<u>Commercial livestock and game ranching:</u> 6,000 farmers work 44% of the land individual land ownership = credit-worthy capital and knowledge intensive excellent farming and marketing infrastructure influence farming decisions, e.g. Nat Rld Mgt P & S export niche: quality (organic) meat, pelts, trophies production oriented: 20-25% turnover, > 8 kg beef/ha

#### **Dilemma of Namibia's northern agro-pastoralists:**

Factors pushing production: technical advice farmer training mentoring farmer organization market development

Causing problems such as: livestock over-population rangeland degradation desertification rural poverty

Factors *pulling* production: bankable tenure lift/move veterinary cordon (e.g. commodity-based marketing with traceability and HCCP analysis – MCA study 2014) diversify export markets influence planning, decision-making

Too few "pull" factors,

markets & prices

especially limited



# Climate change adaptation/mitigation by Namibia's northern agro-pastoralists:



Dry-land cultivated pastures of indigenous, perennial climax grasses



Vertical expansion of livestock production
 Integrate grass leys into crop rotation to improve soil fertility and stability
 Shift grazing pressure to cultivated pasture to rehabilitate native range
 Create drought fodder bank of hay
 Grass-based feedlots



## Climate change adaptation/mitigation by Namibia's communal farmers:



Stud-breed genetics of indigenous livestock: water-wise, heat- & parasite-tolerant



Counter desertification of arid regions (by rural electrification)
 Sustainable rangeland management (NRMP&S) and rangeland rehabilitation
 Conservation tillage of crop fields
 Better land use zoning: farming and conservancy areas
 Re-forestation with valuable indigenous tree species
 Alternative livelihoods to agro-pastoralism: industrialization, service industries



## Climate change adaptation/mitigation by Namibia's commercial ranchers:



Apply resources to farm <u>sustainably and holistically</u> on 44% of land area!
 Re-vitalize grazing land: control encroacher bush, add value to extracted wood, actively strengthen perennial grass sward (NRMP&S)



- > Farm more ecologically-adapted animals: goats, karakul sheep, game
- Adapt zoo-sanitary measures to promote game ranching (e.g. buffalo)
  Add value to livestock products

Regional, experiential climate-smart training of farmers' associations (SACAU?)



Mineral deficiencies of cattle and goat in the Northern Communal Areas: Baseline Survey of Animal Nutrition

Se-

-: P, Cu, Mn, Zn, I

As+



# Need for energy, protein supplementation depends on rangeland condition:





Need for mineral supplementation depends on soil fertility: most fertile, loamy soils ilkaline soils leached soils STD: low (<5%) BVD: high (>70%) Parasites: very high (95%)



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Regional, experiential climate-smart training of farmers' associations (SACAU?)
 Improve productivity of workers: living conditions, training
 Generally mobilize farmers to participate in planning & decision-making (SACAU?)

