

Climate change adaptation in relation to livestock and livelihood in West Africa

Augustine Ayantunde, Mario Herrero, Philip Thornton



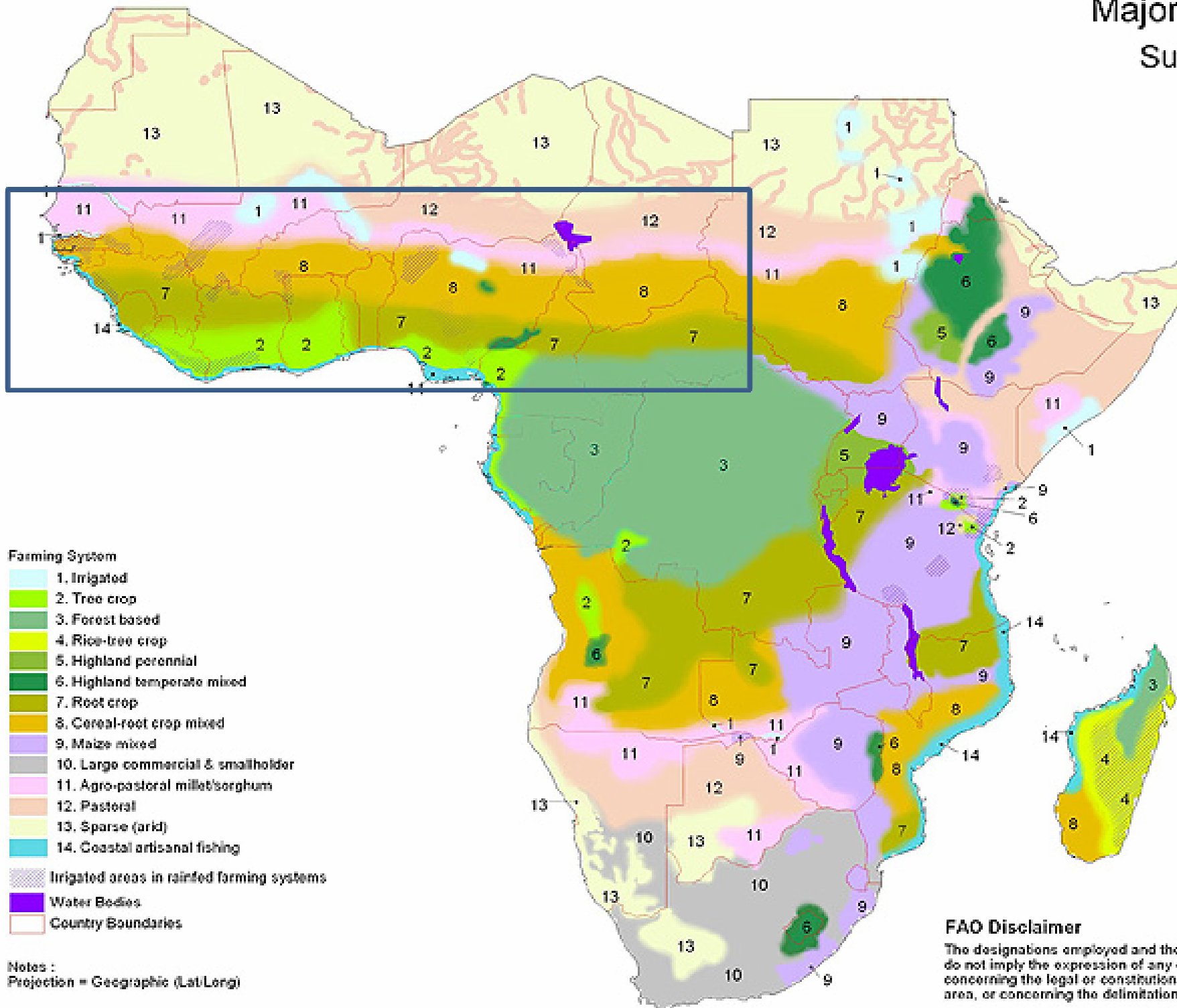
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Outline of the presentation

- Background on livestock production systems in West Africa - features, changes, challenges and opportunities
- Impacts of climate change on livestock & livelihoods – general & specific
- Adaptation strategies at community level
- ILRI work on climate change adaptation
- Conclusion

Major Farming Systems Sub-Saharan Africa Map 1



Highlights of livestock sector in West Africa

- 80 million poor livestock keepers – 47% of West Africa's population (14% of the World total)
- 80% in mixed crop livestock systems
- Production of livestock products increasing slowly (2.5%/annum)
- High imports of livestock products especially milk
- Smallholders produce at least 50% of the regions' domestic livestock products
- Multiple production objectives
- Low external-inputs

Challenges to livestock production in West Africa

- Low productive potential of local breeds
- Seasonal feed scarcity and low quality
- Declining grazing areas and problem of access to water
- Low and declining soil fertility / land degradation
- Climatic change and variability e.g. drought
- Institutional and policy-related constraints
- Diseases – trypanosomosis in sub-humid/humid zones
- Market access

Drivers of change in livestock production systems in West Africa

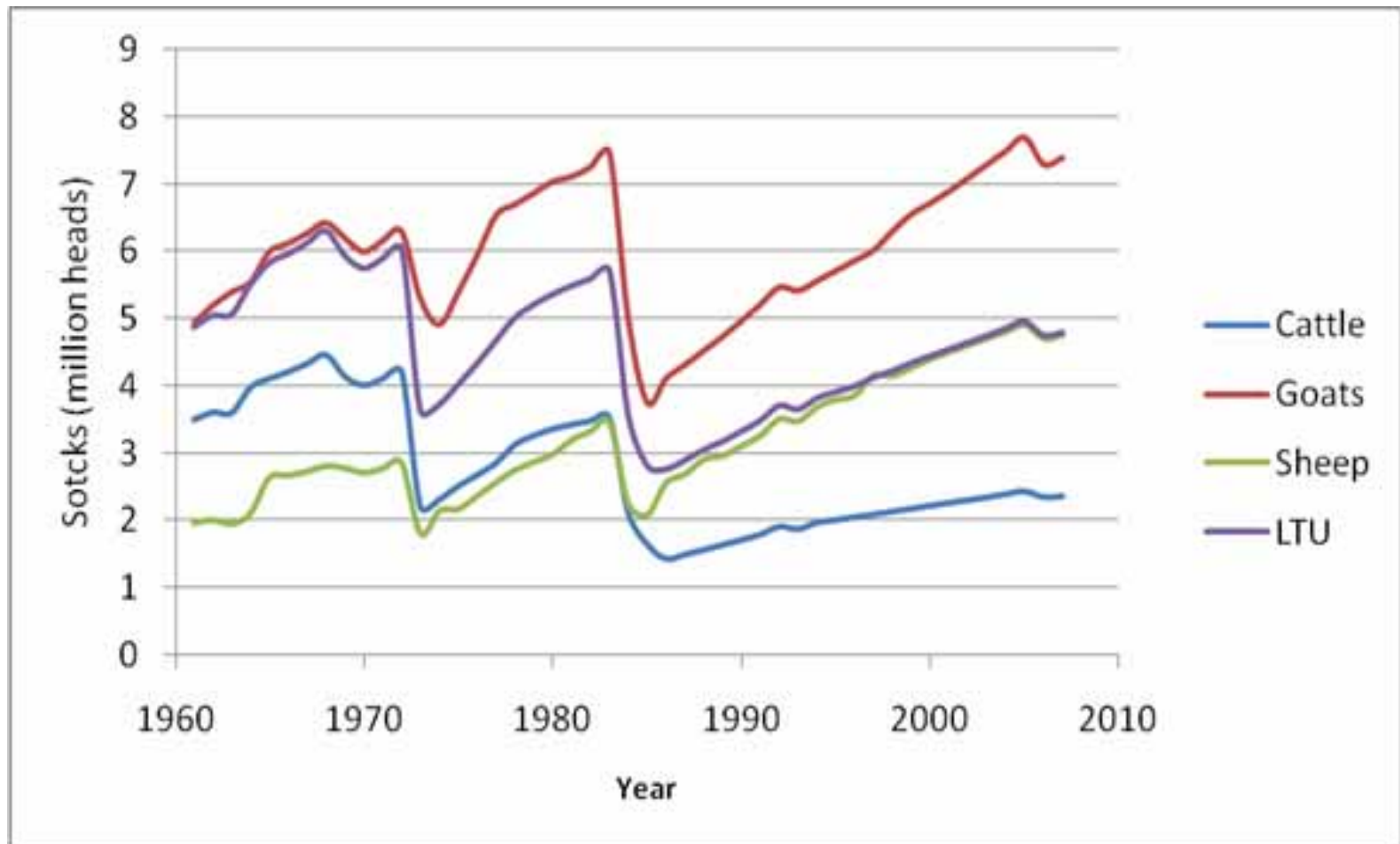
- Rapid population growth
 - Expansion of cultivated land into marginal land
 - Fragmentation of grazing areas (restricted animal mobility)
 - Increase in livestock population
- Economic growth
 - Increase in demand for animal products
 - Shift in livestock ownership pattern
 - Increasing importance of urban agriculture
- Climate change and variability
 - Occupational diversification
 - Sedentarization of pastoralists

Key questions on climate change adaptation relating to livestock

- What type of livestock management is suited to changing climate and where?
- Which animals (species & breed) should be kept in which areas and what are the trade-offs?
- Which animal diseases should we focus on?
- How can we add value to existing livestock-based adaptation strategies?

Specific impacts of climate change on livestock production – what we know

- Decline in livestock productivity
- Decline in forage resources
- Problem of access to water
- Restricted livestock mobility
- Conflict over natural resource use
- Fluctuations in livestock market prices
- Animal diseases (emerging and re-emerging)
- Species and breed of livestock that can be kept e.g. shift in livestock species from cattle to small ruminants in Sahelian countries as a result of droughts



Livestock demographic trend in Niger (source : FAO stats)

Features of adaptation to climate change at community level

- Large variety of adaptation strategies, context-specific and dynamic
- Adaptation strategies are often integral part of current livelihood systems
- Often a mixture of available livelihood options (crop, livestock, off-farm activities etc)
- Benefits are highly localised
- Focus on short-term adaptation (reactive)
- Depends mainly on indigenous knowledge and social safety nets
- Often inadequate in event of severe climatic shocks e.g. prolonged droughts

Climate change and adaptation – partnership indispensable

- A large global community is working on climate change issues across sectors and disciplines:
 - Inventories of greenhouse gases (EPA, IPCC, RIVM)
 - Climate prediction and modelling (universities/research centres)
 - Adaptation options (FAO, NGOs, CGIAR centres, universities, industry, private sector)
- Livestock issues in developing countries are not well articulated or well studied

ILRI's work on climate change adaptation

- ❖ Framework for climate change adaptation work:
 - Analytical and diagnostic studies
 - Identifying hotspots of climate change and vulnerability
 - Vulnerability assessment to identify intervention options
 - Climate change scenarios and assessing *ex-ante* adaptive responses and impacts on livestock communities and ecosystems
 - Test feasibility of promising adaptation options, support design and formulation of adaptation strategy
 - Assess feasibility of index based livestock insurance (IBLI) for large populations facing covariate risks linked to climate change
 - Identify institutional arrangement to deliver livestock insurance product to the poor, particularly women
 - Build capacity of research and non-research actors

ILRI's work on climate change adaptation

- Support implementation of adaptation projects
 - Pilot testing of adaptation interventions eg. IBLI
 - Results based monitoring and evaluation, focusing on what works, what does not work, and why, lessons learned and issues for scaling up

ILRI study on mapping vulnerability to climate change

Data at different scales: country, province, 18 km²

Physical capital

- Market access (ILRI)

Natural capital

- Crop suitability (FAO, GLC2000)
- Soil degradation (GLASOD)
- Water availability (FAO Water Atlas)

Social capital

- Human poverty index (HDR)
- Governance (World Bank)

Financial capital

- Agriculture as % of GDP (World Bank)
- Imports vs Exports (World Bank)

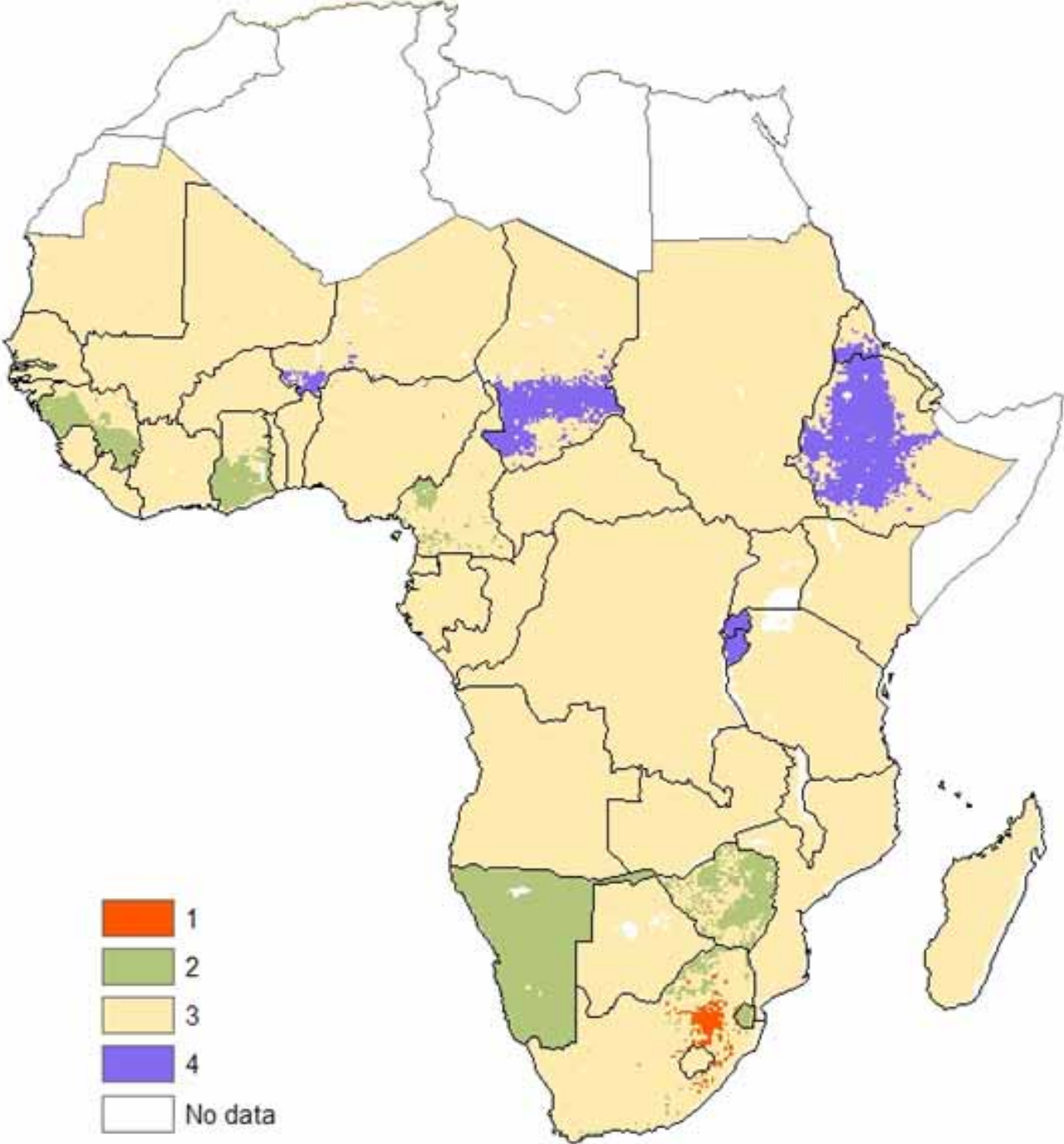
Human capital

- Stunting (FAO, CIESIN)
- Infant mortality (CIESIN)
- Wasting (CIESIN)
- Public health expenditure (HDR)
- Malaria risk (MARA)
- HIV/AIDS prevalence (HDR)

14 Indicators used

Quartiles of the overall vulnerability indicator

Mapped at systems level within each country. Quartile 1, "less vulnerable"; quartile 4, "more vulnerable"



Synthesis of hot-spots

MRA, mixed rainfed arid-semiarid systems

LGA, rangeland arid-semiarid systems

	Highest vulnerability quartile (4)	Second-highest vulnerability quartile (3)
Possibly severe LGP loss (>20% to 2050)	<ul style="list-style-type: none"> • Some MRA systems in Sahel • Mixed rainfed and highland perennial systems in Great Lakes region of E Africa • LGA systems in parts of E Africa 	<ul style="list-style-type: none"> • MRA, LGA systems in large parts of Sahel • Livestock systems and some mixed systems in parts of E and southern Africa • Coastal systems in E and parts of southern Africa
Possibly moderate LGP loss (5-20% to 2050)	<ul style="list-style-type: none"> • Mixed systems in parts of E Africa 	<ul style="list-style-type: none"> • Coastal systems of parts of W Africa • Tree crop systems in parts of W Africa • Forest-based systems in central Africa • Root-based and root-mixed systems in south central Africa

Use such information as one input to evaluating trade-offs (e.g., numbers of poor versus density of poor) in relation to specific development criteria

Adaptation strategies of agro-pastoral communities

- Local perception on droughts in Niger (ILRI, 2008)

Site	Trend	Vulnerability	Vulnerable groups	Comments
- Fakara	Increased	High	Children and elderly people, and those without livestock	Incidence has increased in the last decade
- Gabi	More frequent	High	Children and elderly people, poor households, and those without livestock	Abrupt cessation of rains and insufficient rainfall occurs nearly once in every 4 years since 1998
- Zermou	Very frequent	High	All households but those without livestock are more vulnerable	Incidence has increased significantly in the last two decades

Adaptation strategies of agro-pastoral communities in response to droughts in Niger (ILRI, 2008)

❖ **Crop-based households**

- Plant drought resistant crops & cultivars
- Use short cycle crop species & cultivars
- Plant in widely dispersed fields
- Pursue intricate re-seeding calendars
- Send more family members on migration
- Collect and eat wild plants and animals

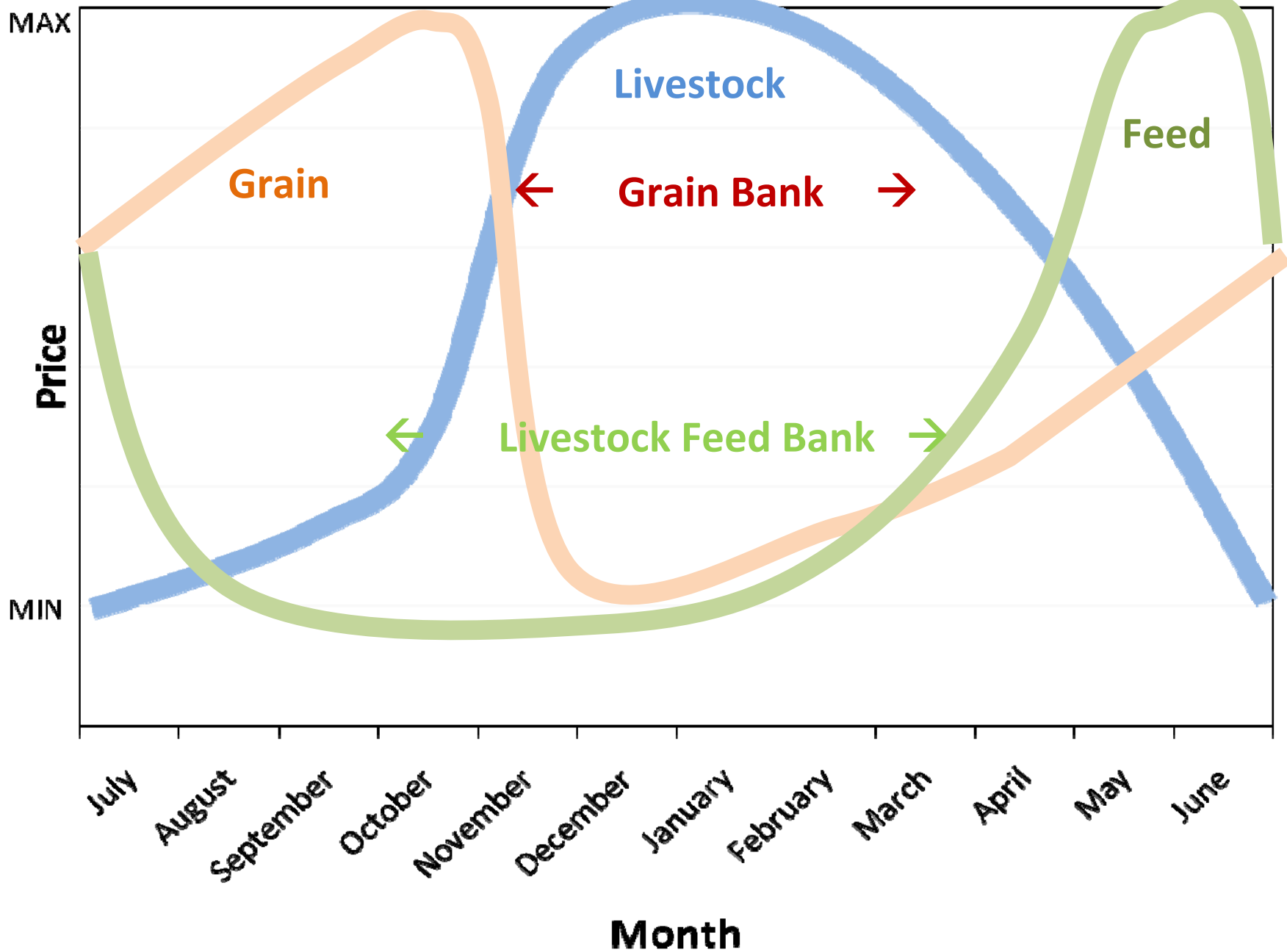
❖ **Livestock-based households**

- Sell animals to buy cereals
- Invest in multiple livestock species
- Entrust animals to other herders to maximize herd dispersal
- Moving animals to maximize access to pastures
- Send more family members on migration
- Assistance from family/close relations

Community actions and external assistance for future preparedness (ILRI, 2008)

Site	Community action	External assistance
Fakara	<ul style="list-style-type: none"> - Expansion of cultivated land - Application of fertilizers - Adoption of improved crop varieties and those tolerant to drought - Reclamation of degraded land - Off season farming especially vegetable production. - Migration 	<ul style="list-style-type: none"> - Agricultural inputs such as fertilizer, seed, pesticide - Establishment of input shops and grain bank - Provision of wells for off season farming
Gabi	<ul style="list-style-type: none"> - Expansion of cultivated land - Sending more family members on migration 	<ul style="list-style-type: none"> - Agricultural inputs- fertilizers, improved seeds - Feed supplements and veterinary drugs - Establishment of cereals bank - Protection of rangelands from being cultivated - Better access to credit - Training in income generating activities
Zermou	<ul style="list-style-type: none"> - Expansion of cultivated land - Sending more family members on migration - Off season farming 	<ul style="list-style-type: none"> - Distribution of improved cattle breeds by the government or NGOs - Agricultural inputs – fertilizers, seeds - Establishment of inputs shops

Adaptation strategies of agro-pastoral communities in response to droughts in Niger (ILRI, 2008)



Animal Diseases and Climate Change

- Major global changes in the distribution of vector-borne diseases to new “warmer” habitats (blue tongue of sheep in Europe, “highland” malaria in Africa)
- Climate is an important but not the only driver of change in disease distribution (population, intensification of systems)

Tsetse Distribution and Climate Change



Model predictions for to changes in tsetse distribution to 2030 from current distributions for morsitans (left), fusca (centre) and palpalis (right) tsetse groups as a result of changes in length of growing period

- No change: Absent
- Presence to Absence
- Absence to Presence
- No change: Present

Conclusion

- Livestock represent the major stores of wealth that are mobilized in response to climatic shocks e.g. shocks
- Adaptation strategies in response to climate change at community level involves a mixture of livelihood options.
- Activities needed to enhance adaptive capacity of rural communities are essentially the same as those required for sustainable development.
- Adaptation strategies are often location-specific and recommendation domains of limited scale
- Adaptation to climate change need to be considered in the context of other significant drivers of change

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