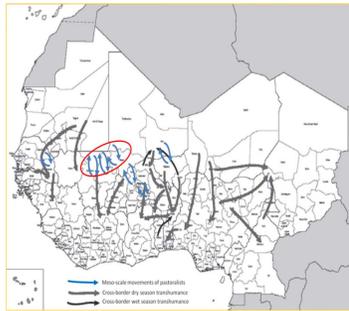


## Introduction

Pastoral and agricultural systems, and pastoral and agricultural livelihoods, are tightly coupled and interdependent in West Africa. However, conflict is on the rise between pastoralists and agriculturalists, particularly in regions where agricultural land is scarce and encroaching on traditional transhumance corridors. We are developing methodologies for mapping the location, status and current utilization of transhumance corridors, and how they relate to changing agricultural land-use. We will carry out extensive field surveys in Mali (along primary transhumance axes in the Nioro-Nara-Dièma-Baoulé-Kita and Inland Delta regions of the administrative Regions of Koulikoro, Segou and Mopti) as the basis for methodological development, and then use remote sensing to scale to other regions of Mali and the wider Sahel.

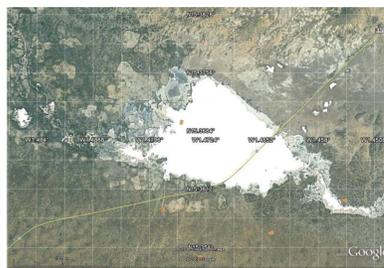
## Transhumance in the Sahel



Map of West Africa showing examples of large scale, wet and dry transhumance patterns (grey and black lines) and more meso-scale movement patterns (blue lines) in West Africa. Red circle shows primary study zone in the Nioro-Nara-Dièma-Baoulé and Delta regions of Mali. Base map updated from Kamuanga et al, 2008; meso scale patterns drawn from Legrosse 1999; Adriensen and Neilsen 2002; Turner 2006; Clanet and Ogilvie 2010; Wane et al. 2010.

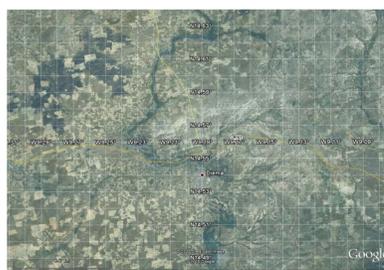
- Traditional movement corridors link the Sahel to more humid regions in the south
- Gradient of increasing forage quality but decreasing water resources S to N
- Pastoralists travel north in the rainy season to graze – out of southern agricultural regions
- Travel back south as water dries out, grazing on crop residue and fertilizing fields
- Complementarity

## Land use and conflict



### Lake Agoufou, Gourma region

Newly perennial and newly settled lake in the Gourma region of Mali. Agoufou was an ephemeral water stop in the past. Notice small agricultural holdings on the shore and in the region.



### Agriculture, Dièma region

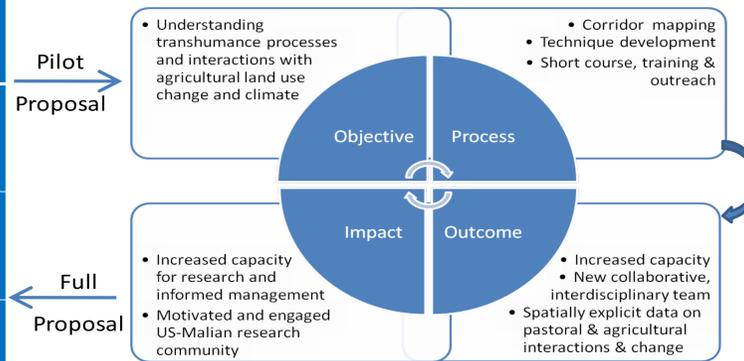
There are at least four traditionally utilized north-south transhumance routes within 80 km of Dièma in central Koulikoro region, each of which have challenges with respect to access to water, forage and agricultural encroachment

- Agricultural expansion is occurring
- Problems arise when cattle and un-harvested crops are in the same place at the same time
- Pastoralists see their ability to graze, access water and move restricted
- Agriculturalists see their crops damaged

## Long-Term Objectives

- Reduce vulnerability of West African extensive livestock systems
- Enhance income sustainability and stability for pastoral communities
- Optimize pastoral-agricultural complementarity
- Avoid conflict through anticipation & mitigation of flash-points

## Pilot Project Objectives, Process, Outcome and Impact



## Key Questions

- Which areas are nearing critical points based on spatial contact and/or limiting resources?
- Can traditional strategies and structures for pastoral-agricultural relations cope/adapt?
- What alternatives can be developed to mitigate conflict?
- Can we integrate agricultural and pastoral development programs in ways that reduce potential for conflict?



Sahel grazing lands



End of the dry season



Grazing on agricultural residue



Young Fulani herder

## Pilot project objectives

- Identify and analyze the distribution of transhumance movement corridors in intensive study areas
- Develop methods to map these corridors over larger areas
- Examine trends in land use, grazing and water resources to identify constraints on corridors
- Identify potential resource based flash points
- Build capacity
- Plan for more expansive future project

## Process

- Herd GPS monitoring in intensive study areas for location, status and current utilization
- Field surveys of: routes, intensity of activities (*transhumant movements, herd counts, agriculture*), community knowledge, attitudes and perceptions
- Corridor detection, mapping and modeling activities
- Integration of new transhumant corridor information with land use trends data sets to identify areas of potential conflict
- Combine survey and geospatial data to analyze resource based conflicts
- Remote sensing and geospatial analysis training at SDSU-GISCE
- Community outreach and dissemination of results

## Outcomes and future directions

The project will prepare the way for a longer term study of pastoral livelihoods in the region as impacted by changing climate, demography, agricultural land-use and socioeconomic conditions. Working with an interdisciplinary team of Malian and US researchers, educators and non-governmental organizations (NGO) we will focus on analysis of current and future constraints on pastoral livelihoods, and agricultural-pastoral conflict avoidance, where transhumance corridors and availability of agricultural land, together with access to water and grazing lands, constitute key resources, and key resource-based flash-points. Results from the pilot and the longer term study will provide invaluable information for natural resource managers, policy and decision makers at local, regional and national levels, and will directly benefit the region via opportunities for preemptive intervention to reduce and avoid conflict between pastoral and agro-pastoral communities.

## NGO Partners

**ADISSAH** (Association pour le Développement Intégré dans la Savane et le Sahel)

**CEPAP** ( Centre d'études pour la Promotion agro-pastorale)

**RICAD** (Recherche d'Initiatives et de Coopération pour un Développement Communautaire et Autonome)

