

## **Working Papers**

### **Working Paper No. 99-02**

#### **Executive Summary Of Mali PLLA Activity**

February 17,1999

#### **Introduction**

Results from a Participatory Landscape Lifescape Appraisal (PLLA) in Mali suggest several potential research topics related to the themes of natural resource management, food security, conflict, and poverty. This executive summary will: 1. Summarize key emergent themes from the participatory appraisal; 2. Identify problems as prioritized by village research participants and 3. Present potential research questions that emerged from the interactive research process.

#### **Mali PLLA Research Objectives**

The objectives for the PLLA conducted in Mali included the following:

1. Seek to understand the Landscape Lifescape Interactions in the study area focusing on:
  - a. Natural Resource Use, Access and Control
  - b. Food Security
  - c. Poverty
  - d. Conflict related to Natural Resource Use
2. Assess natural resource management practices and incentives which motivate those practices under varied circumstances;
3. Identify Conflicts related to natural resource use;
4. Investigate natural resource conflict management strategies in historical, current and future scenarios;
5. Identify decisions made by natural resource decision makers at the communal level in historical, current and future contexts;
6. Prioritize research questions and information needs.

#### **Research Site**

Bamako, Mali (January 25-27,1999)

During a three-day workshop held in Bamako, Mali (January 25-27, 1999), the research site was jointly selected by SANREM project representatives and local partners, which included the Rural Economic Institute (IER), the Institute of the Sahel, CARE-Mali, PGRN (Project for Natural Resource Management), and others. The site selection criteria included: the degree to which the site was representative of Mali and the broader Sahelian region; the presence of a variety of agricultural activities (i.e. cultivation, animal husbandry, fishing, transhumance, etc.); the presence of conflict related to natural resources; year-round accessibility; receptivity and willingness to participate from rural partners; and availability of secondary data related to the site. Following an analysis of

each site in reference to the selection criteria, the Djenne Circle in the Mopti Region Delta was selected. The commune (or lowest governmental administrative unit within the rubric of decentralization) chosen was Madiama. Within the Madiama Commune, two representative villages were identified: Madiama and Tombonkan. After preliminary research in the area, it was determined that an additional village in the area was also implicated in natural resource management and conflict issues in the same landscape. The third village incorporated in the research was Nerekoro. The principle conflict identified in the Madiama Commune was between sedentary farmers (Madiama) and herders (both sedentary and pastoral, primarily from Nerekoro).

Madiama and Tombonkan are both composed primarily of sedentary agriculturists dominated by the Maraka or Sonnike ethnic groups. Animal husbandry is practiced at all three sites. Nerekoro in contrast, is a sedentary village, but is composed primarily of Peuhl herders and Remaibe farmers. (Remaibe live in association with Peuhls and are culturally very similar to Peuhls. Historically however, the Remaibe were Peuhl slaves.) The larger PLLA team divided up into three smaller groups in order to work in each of the three villages. Intensive participatory rural appraisals (PRAs) were conducted over a six day period followed by two days of follow-up questions and a village wide meeting in which the research results were shared with village participants and their research priorities were solicited.

### **Principal Themes by Research Objective**

The key themes that emerged from each of the three villages will be presented by research objective.

#### **MADIAMA (Sedentary Farming Village)**

1. Seek to understand the Landscape Lifescape Interactions in the study area focusing on:  
*a. Natural Resource Use*

Most of the available land within Madiama's village limits is used for agricultural production.

Fallow is not practiced.

There is inadequate arable land (Extensive agriculture is practiced using animal traction.)

All available land is under cultivation regardless of soil fertility.

The size of grazing land has diminished due to increased field sizes.

#### *b. Natural Resource Access and Control*

Madiama farmers determine access and control issues regarding natural resource management in their territory.

#### *c. Food Security*

During a poor rainfall year, 80% of the village population is food insecure. They employ strategies to meet their food needs including selling small ruminants and engaging in various small commercial activities. (20% of the population is food secure regardless of rainfall and harvest.)

#### *d. Poverty*

Based on a village self-assessment, 20% of the population is rich; 60% is intermediate and 20% is poor. 80% of the village, or the rich and middle classes, have animal traction equipment.

Village infrastructures are well developed including: a new school, a village health center, birthing center, pharmacy, pumps and a grain mill.

Revenue sources are quite diversified. (Watermelon is a significant cash crop in the area.)

2. Assess natural resource management practices and factors that influence those practices:

*a. State of Resources and NRM Practices*

Very poor soil fertility.

Fallow not practiced, the same parcel is cultivated year after year without crop rotation. Intercropping is practiced (most notably with cowpeas and cereals such as millet or sorghum).

Organic fertilizer (manure) is used to as great an extent as possible in dryland farming, Chemical fertilizers are used in irrigated rice plots.

Animal traction is used in 80% of dryland farming. The remaining 20% is cultivated using hand-held hoes.

Fields are borrowed from neighboring villages for cultivation (particularly Kessedougou, Doudourani, and Teguegne)

*b. Influencing Factors*

Factors which influence agricultural production decisions and natural resource management strategies include: soil type, anticipated rainfall (based on the duration and intensity of the cold season), family size, farming equipment, market prices for cash crops and social factors (e. g. bride price, funerals, etc.).

3: Identify Natural Resources

Conflicts between farmers and herders and the most frequent and contentious in relation to all natural resources in the area including: fields, pasture, water (seasonal wetland/pond), and trees.

Damage in Madiama farm fields caused by Nerekoro animal herds was the primary source of conflict identified.

Passage routes for animals (either from neighboring villages or further away) have diminished due to increased extensive agriculture (due both to declining soil fertility and the availability of animal traction). Competition for a seasonal wetland/pond is intense between Madiama and Nerekoro.

(Bambara term for the wetland: *Sileko*; Peuhl terni: *Feyawe*)

There are some conflicts between farmers within Madiama due to land tenure. They are settled amiably.

4. Identify Conflict Management Strategies

*a. Historic*

Historically, NRM conflicts were managed by the village chief and his counselors

*b. Current*

Currently, most NRM conflicts are resolved at the village level by the chief and his counselors. However, if the conflict is not settled at this level, it will continue to the Chef

d'arrondissement level (current pre-commune context), then the Justice Ministry at the Circle level (Djenne) or the regional authorities in Mopti.

*c. Ideal Scenario*

The Madiama village leaders currently see no areas for improvement in the conflict management strategies (despite a long-simmering conflict with the residents of nearby Nerekoro).

5. Identify Decisions made by Commune-level Authorities

*a. Historical and Current*

In historical and current contests, supra-village decision-making hasn't influenced natural resource management practices in Madiama.

*b. Future/Ideal*

Currently, the Madiama residents have heard of the term decentralization, but claim to be unaware of any of the details about it.

**NEREKORO (Sedentary Herder/Farmer Village)**

1. Seek to understand the Land Issue Lefscape Interactions in the study area focusing on:

*a. Natural Resource Use*

The majority of land within Nerekoro's village limits is used for agricultural production (i.e. cultivated fields).

The size of pasture areas has decreased both within and outside of Nerekoro.

*b. Natural Resource Access and Control*

The Nerekoro residents determine access and control issues in their immediate village territory. However, outside of Nerekoro during nomadic pastoral periods, sedentary farmers have greater access and control than transhumant herders.

*c. Food Security*

Food Insecurity is a common problem in Nerekoro. Strategies employed to respond to this problem include selling cattle, reducing the number of meals consumed per day, and increased consumption of wild foods.

*d. Poverty*

Village self-analysis indicates high levels of poverty (80% of Peuhls and 95% of Rernaibe).

However, the indices used to establish wealth ranking may have been based on ideal circumstances and not relative to current realities.

Infrastructures in Nerekoro are weak or non-existent. They rely on the school and health center in Madiama for education and health services.

The primary revenue source in Nerekoro is animal sales.

2. Assess natural resource management practices and factors. which influence those practices

*a. State of Resources and NRM Practices*

Fallow is practiced, generally for three-year long periods

Soil fertility is low

Organic fertilizer (manure) is used in fields (to the extent it is available)

Zai (anti-erosion, moisture retaining rock structures) are employed in farm fields.

Pastures are not managed, rather herders move their animals in order to maximize the health of the herd and not the state of the pasture.

*b. Influencing Factors*

Factors that influence production strategies and NRM practices include: maximum use of available space and maximal herd size.

3. Identify Natural Resource Conflicts

The primary natural resource related conflicts identified by the Nerekoro were between farmers (outside of Nerekoro proper) and Nerekoro herders. The reasons for these conflicts include the following: increased areas under cultivation, reduced pasture areas, reduced animal passage routes, damage caused in fields by cattle, and competition for the seasonal wetland/pond (*SilekolFeyawel*).

4. Identify Conflict Management Strategies

a. Historical

Historically, NRM conflicts were managed by the Village Chief and his counselors. If a conflict could not be resolved at that level, it was taken to the Chef de Canton. Following independence, unresolved conflicts were taken to the Chef d'Arrondissement.

*b. Current*

Currently, NRM conflicts are managed by a variety of structures including: the Village Chief and Counselors, the Chef d'Arrondissement and the Justice Ministry at the Circle and Regional levels.

A variety of practices are employed to mitigate conflict. They include: taxes for grazing, rights, herder cooperatives, establishment of a pastoral calendar regarding herd movement, and animal corrals during the rainy season.

*c. Ideal*

Scenarios regarding more ideal natural resource conflicts include inter-village conflict management structures, adherence to the government-determined pastoral calendar and a more just tax system.

5. Identify decisions made by communal level decision-makers

a. *Historical*

Historical decision-makers include the Village Chief within the village, tax systems for grazing rights in the bourgou, and free access to forest products and water.

*b. Current*

Current supra-village level decisions include: establishment of the pastoral calendar by the Malian government, wood cutting permits issued by the government, and tax systems established by other authorities (i.e. river crossing fees by the government, bourgou grazing rights by residential villages and field damage fees levied by implicated villages).

*c. Ideal*

Ideal NRM commune level decision-making would include: recognition of Nerekoro land tenure rights, Nerekoro-authorized natural resource use in their territory and the creation of a fair tax system relative to animal passage and potential damage caused by herds in fields.

TOMBONKAN (Sedentary Agricultural Community)

1. Seek to understand the Landscape Lifescape Interactions in the study area focusing on:

*a. Natural Resource Use*

Agricultural fields predominate the land use, while pasture area has been reduced.

Tombonkan is experiencing severe land degradation.

Insufficient permanent wetlands, presence of 7 wells.

No forest, poor wildlife population.

Land is farmed without the possibility of extension.

*b. Natural Resource Access and Control*

The founding ethnic group, the Maraka (agro-pastoralists), have most access and control of natural resources.

Women have no control over natural resources.

*c. Food Security*

Cereals compose the base of food production and consumption.

The main sources of protein are fish and beans.

The main seasons of human hunger are from August to the beginning of September.

The principal hunger season for livestock is from May to July.

Agriculture is the principal source of revenue.

Animal husbandry is a strategy for saving money.

*d. Poverty*

The Djoula ethnic group is the most prosperous.

80% of the population own agricultural equipment.

The population of Tombonkan owns more than 150 traction animals.

Tombonkan is poor in socioeconomic infrastructure.

2. Assess natural resource management practices and factors which influence those practices

*a. State of Resources and NRM Practices*

All the inhabitants of Tombonkan farm, but they also fish, raise livestock, make crafts, and engage in petit commerce.

Women collect and process local fruits.

Two types of livestock production are practiced: nomadic and sedentary.

Monoculture farming dominates dryland farming (millet and sorghum primary examples).

Crop rotation and cereal, legume intercropping are infrequently practiced.

Animals are kept in corrals.

Crop residues and bourgou grass constitute the forage stocks.

Extensive animal traction practiced.

Rice culture is practiced in managed paddies, out of the paddies, and in lowlands.

Localized application of manure and compost.

Gender-dependent degree of participation in natural resource management.

Women participate more in planting and harvesting activities.

Tombonkan uses early-germinating varieties.

Famine foods are cultivated. Fishing in neighboring areas.

Oversight and protection of the environment by the hunters' association.

*b. Influencing Factors*

Grain varieties selected for cultivation and land allocation for that cereal are based on soil

types.

### 3: Identify Natural Resource Conflicts

#### **Farmer-Farmer Disputes:**

Location of territorial boundaries

Borrowed land

Use of wetland areas where *bourgou* grass grows.

#### **Farmer-Herder Disputes:** (the most frequent form of conflict)

Livestock damage to crops

*Use of bourgou* grass by the farmers (harvested and stored as fodder)

Cultivation of former (and current) livestock passage routes

#### **Territorial Land Tenure Disputes**

Location of territory boundaries

Borrowed land between villages

Use of *bourgou* grass in the wetlands

Livestock damage to crops

#### **Gender Disputes**

Borrowed land

### 4. Identify Conflict-agreement Strategies

#### *a. Historical Context*

Application of customary law

Application of colonial law

Islamic and traditional legislation (the Dina [Sekou Amadou])

#### *b. Current Context*

Application of customary laws

Application of modern legislation (government extension agencies: animal husbandry, agriculture; the disputants; representative of government administration)

Government-determined calendar of livestock passage to the *bourgou* pasture

#### *c. Ideal Context*

Delimitation of spaces between different territories and between different production systems.

Agricultural intensification to free up more space for livestock production.

Use of salt licks and manufactured animal feed.

Management of former wetland areas in order to reintroduce *bourgou* cultivation and fish.

Introduction of soybeans for bouillon cube production (to replace *sumbala*, a traditional bouillon made from Nere tree pods, *Parkia biglobosa*).

Reforestation

Collaboration among different partners

Education and information on land use management

### 5. Identify Decisions made by Commune-level. Authorities

#### *a. Historical Context*

Head of household  
Chief of the village and advisors  
Chief of the Canton (Promani)

*b. Current Context*

Village counsel  
Head of household  
Administrative level decision-makers for conciliation  
Justice system

*c. Ideal Scenario*

Responsible communal-level decision-makers would be chosen judiciously  
Influence would be avoided

**Primary Problems Identified by Villagers**

As Part of the participatory research process, the relevant villages were asked to identify and prioritize the issues discussed during the previous week's work. The main categories of discussion included: natural resources, food security, conflict and poverty. In each village the priorities varied slightly, but the overall areas of concern overlapped and are complementary.

Information regarding the specific problems identified and their respective prioritization by village follows.

**MADIAMA**

The village participants in Madiama were quite clear and adamant that their primary problems are in relation to natural resources. The top two priority problem areas identified included: 1. Lack of water (rainfall for cereal crops and river floodwater levels for irrigated rice); and 2. Decreased soil fertility in relation to dryland cropping.

**NEREKORO**

The residents of Nerekoro prioritized their problems in the following order (from highest to lowest): 1. Food Insecurity; 2. Natural Resources (i.e. water shortages); and 3. Conflict. Nerekoro villagers identified a widespread lack of food self-sufficiency within their community as well as a lack of production methods adapted to local conditions. In reference to natural resources, water shortages were identified as the primary concern in terms of agricultural production, domestic use and animal husbandry. The third priority area of conflict is in reference to the long-simmering disagreements between Nerekoro and neighboring Madiama as well as with sedentary farmers in areas where the Nerekoro herders travel to graze their cattle.

**TOMBONKAN**

The types of natural resource and agricultural conflicts identified in Tombonkan were quite similar to those of Nerekoro and Madiama. In terms of natural resources, the following problems were identified: shortage of land, reduced soil fertility, water shortages, insufficient pasture, insufficient trees and a shortage of fish. In reference to food security, several of the same natural resource limitations were cited. In addition,



crop pests and a lack of farming equipment were also identified. In reference to conflicts, a shortage of arable land, poor harvests and poverty were cited as problems. Problems in relation to poverty included insufficient water, inadequate production, and natural resource degradation.

### Research Questions

The research questions identified by village participants from all three communities active in the research are quite similar. Therefore, the questions from all three sites have been consolidated into one list. Given the thematic focus of the research itself, the questions will be presented by category. The research questions presented are a combination of village-identified information needs, responses obtained from PRA activities during the field research, and PRA team member perceptions of pertinent research questions given village concerns. The specific problems and research needs as identified by villagers are available in the village reports (at this time in French).

In general, all three participating communities shared similar concerns. The top priorities of each community varied. An attempt was not made to reconcile inter-village priorities. Rather, the common information needs and research questions identified by the villages will be presented. The citizens of Madiama, Nerekoro and Tombonkan would like to: investigate improved agricultural and animal production; examine how economic activities might be diversified in order to alleviate poverty and enhance food security; and the two smaller villages would like to investigate methods for mitigating inter-village conflict. Although the largest village in the commune, Madiama, did not identify enhancing conflict resolution practices, the research team strongly concurred that this topic merits further investigation given the current level of animosity, long-smoldering disputes, severely constrained natural resources and perceived ownership of the same resources by both parties.

In addition to these topics it should be noted that at every site, water shortages, were highlighted as a concern both in reference to agricultural productivity and human consumption. Although SANREM is not likely to get involved in well digging activities, etc., it should be made aware of these concerns and participant eagerness to resolve these problems potentially through an investigation of area hydrology and groundwater availability.

Thirdly, although the topic of conflict has been highlighted at various points in this summary, it has not been discussed in any detail in the context of forthcoming government decentralization and the establishment of communes. A major point of concern from a number of interested parties including villagers, NGO representatives and local AID mission staff is how the establishment of communes will actually be operationalized, how natural resource management decisions will be made and who will participate in those decisions. This is of particular relevance in the Madiama commune given the village of Madiama's dominance in the commune to be (i.e. population, existing infrastructures, land area under cultivation) and its recalcitrance in reference to relations with Peuhls in the nearby village of Nerekoro. This particular topic of farmer-herder conflict is relevant to Mali as a whole and is applicable in other Sahelian countries as well.

Fourthly, it should also be noted that a wide variety of development players have intervened in the Madiama commune including UNICEF, CARE, government agencies, and research organizations. In particular, given recent government restructuring of its environmental ministries, government agents have become involved actively soliciting village problems, needs and solution identification. Government and NGO colleagues have suggested that SANREM first investigate what research has already been conducted in the study area prior to undertaking research that may be repetitive or complementary to previous or ongoing activities.

### *Natural Resources*

#### Agricultural Production

1. Investigate how to improve soil fertility for enhanced harvests (related themes of wind and water erosion reduction)
2. Investigate how to intensify agricultural production
3. Investigate fertilizer management strategies (chemical and organic) and composting
4. Investigate pest management
5. Investigate how to improve rice production both in irrigated and rain-fed areas particularly in the context of decreased availability of water in both cases
6. Investigate short season cereal varieties
7. Investigate the potential for soybean introduction and useful tree species (investigate appropriate techniques for introducing leguminous crops)