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SOCIAL ANALYSIS

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SOCIAL ANALYSIS

TABLE OF CONTENTS

TABLE OF CONTENTS (2)

TABLE OF CONTENTS (3)

2.0. SOCIAL ANALYSIS

The social analysis of the project is organized into several parts.

PART I : The Ecological and Sociocultural Contexts.

PART II : The Implementation Issues : Participation, Equity, and the Organization and Phasing of Project Interventions.

PART III. Social Institutional Analysis by Project Zone

PART IV : Land Tenure and Irrigated Agriculture in the Senegal River Basin.

PART V : Outmigration and Rural Development in the Senegal River Basin.

PART I

THE ECOLOGICAL AND SOCIOCULTURAL CONTEXTS

2.1. THE ECOLOGICAL AND CULTURAL CONTEXT

This section summarizes the main features of the social systems of rural communities in the Basin. It highlights aspects of the societies which are affected by and interact with major project activities.

The Ecological, Social, and Development Context

The activities proposed in the project paper and their impact on the populations must be viewed within the complex and rapidly changing context of the SRB. The main features of the situation are :

- The sociocultural diversity of the basin ;
- Variations in the ecological conditions ;
- The impact of the dams and the introduction of Irrigated Agriculture.

2.1.1. The Sociocultural Diversity of the Basin

The Senegal River Basin is home for approximately 2 million people divided into seven major ethnic groups : Wolof, Moor, Tukulor, Soninké, Peul, Kassonké and Malinké. Moor and Wolof make up the majority of the population in the Delta and Lower Valley Region. The Tukulor predominate in the Middle Valley (about 60 per cent of the population) and one third of the inhabitants are Moors or Peuls. The Soninkés are the largest ethnic group in the Upper Valley which also contains substantial numbers of Tukulors, Malinkés and Kassonkés. Moor and Peul pastoral communities are scattered throughout the entire Senegal River Basin.

Ethnic identity is very strong in the region although the groups share common social and cultural features such as stratified social systems and the Islamic religion. Pulaar is spoken by the Tukulor and Peul, and each of the other groups has its own language. Many adult males are able to communicate in more than one local language and in most communities there are individuals who speak French, and/or read and write arabic.

In addition to the ethnically homogeneous villages, large commercial-administrative towns such as Podor, Boghé, Kaédi, Matam, and Kayes present an ethnically heterogeneous mixture of traditional and modern values and lifestyles.

The primary occupation for more than 70 per cent of the basin population is subsistence agriculture. Most households also own some livestock and have other sources of income (e.g. commerce, wage labor). Herding is the major occupation for about 20 per cent of the inhabitants, and others earn their living in commerce, salaried jobs, transport, fishing and crafts.

2.1.2. The Ecology of the River Basin : An Overview

The Senegal River Basin is more than 1800 kilometers long and is generally divided into three major ecological zones : (1) The Lower Valley (including the Delta) ; (2) The Middle Valley and ; (3) The Upper Valley. Each ecological zone is marked by differences in topography, pedology, climate and annual flood patterns which affect the pattern of agricultural and other economic activities.

The Delta and Lower Valley is marked by low rainfall (300 mm/year) and salt intrusion, which historically discouraged its settlement and now undermines production in the large-scale perimeters established there. No major project interventions are planned for this area.

The Middle Valley is characterized by low rainfall but is an important area because of the vast, fertile flood plains - 15 to 25 kilometers wide - where flood recession agriculture is practiced. These lands also provide pasture for animals kept locally and for the large herds which follow an annual migratory pattern. The flood recession (walo) lands are highly valued by the population and control over them is at the base of the stratified socioeconomic systems found in the towns and villages of the Middle Valley. These lands are now, and will be increasingly in the future, the focus of land tenure disputes.

The Upper Valley has a relatively high annual rainfall - 500 mm to over 1000 mm in the southeast - but lacks the broad flood plains of the Middle Valley. It is marked by an undulating and often hilly terrain where rainfed depressions allow for a modified form of recession agriculture. The relatively high rainfall pattern permits extensive dryland farming although flood recession agriculture is practiced along the river banks and, to the east of east Bakel (Senegal) on the narrow flood plains. The ecological diversity of this area provides opportunities for the development of rainfed as well as irrigated agriculture.

The traditional seasonal equilibrium in the economies of the valley is based on the ecology and regime of the river and its geographic possibilities for trade and travel. Each year, the May through September rains in the Malian and Guinean foothills send a flood into the Middle Valley and Delta. The interior plains remain flooded until September or October, and recede gradually leaving a residue of soil, humus and moisture.

Agricultural activities follow the flow of water. The interior (djeri) lands are sown soon after the rains begin. The interior flood plains are planted as the water recedes and, finally, gardens are cultivated along the river banks as the water level gradually diminishes.

Throughout the basin, the rainfed interior and flood recession lands are used as pastures by both the year-round village populations and the Moor and Peul transhumant pastoralists. The pastoral populations spend most of the year in the interior, to the north and south of the river, but return to take

advantage of the walo pasture and crop residues during the hot, dry season in March, April and May.

2.1.3. The Impact of the Dams and the Introduction of Irrigated Agriculture

The ecological and sociological impacts of the dams have been investigated and reported on in a major environmental study funded by U.S.A.I.D. (Gannett Fleming and Corddry 1981). The long-term ecological and social changes that will occur when the dams are completed and the annual flooding stopped, require major interventions to mitigate the negative impacts and to ease the transition for the riverine population. Thus, while some project interventions will affect traditional social and economic patterns, their negative aspects must be viewed within the historical context of periodic droughts and the potential post-construction opportunities. The strategy proposed in the project paper is directed towards minimizing the disruptive effects and maximizing the potential benefits of the new conditions.

Irrigated agriculture has already been introduced into many communities and is the key technological innovation in easing the transition. Irrigation, even without the dams, is an appropriate intervention to help inhabitants of the region secure access to water and food self-sufficiency. For this project the issue is how irrigated agriculture can be best adapted to the local context.

The complex ecological, sociocultural, and developmental effects of project interventions necessitate continuing social analysis as an integral part of the project. While the discussion below identifies general patterns and potential impacts, variations between and within villages are significant enough to require village level, social and economic investigation as part of project implementation.

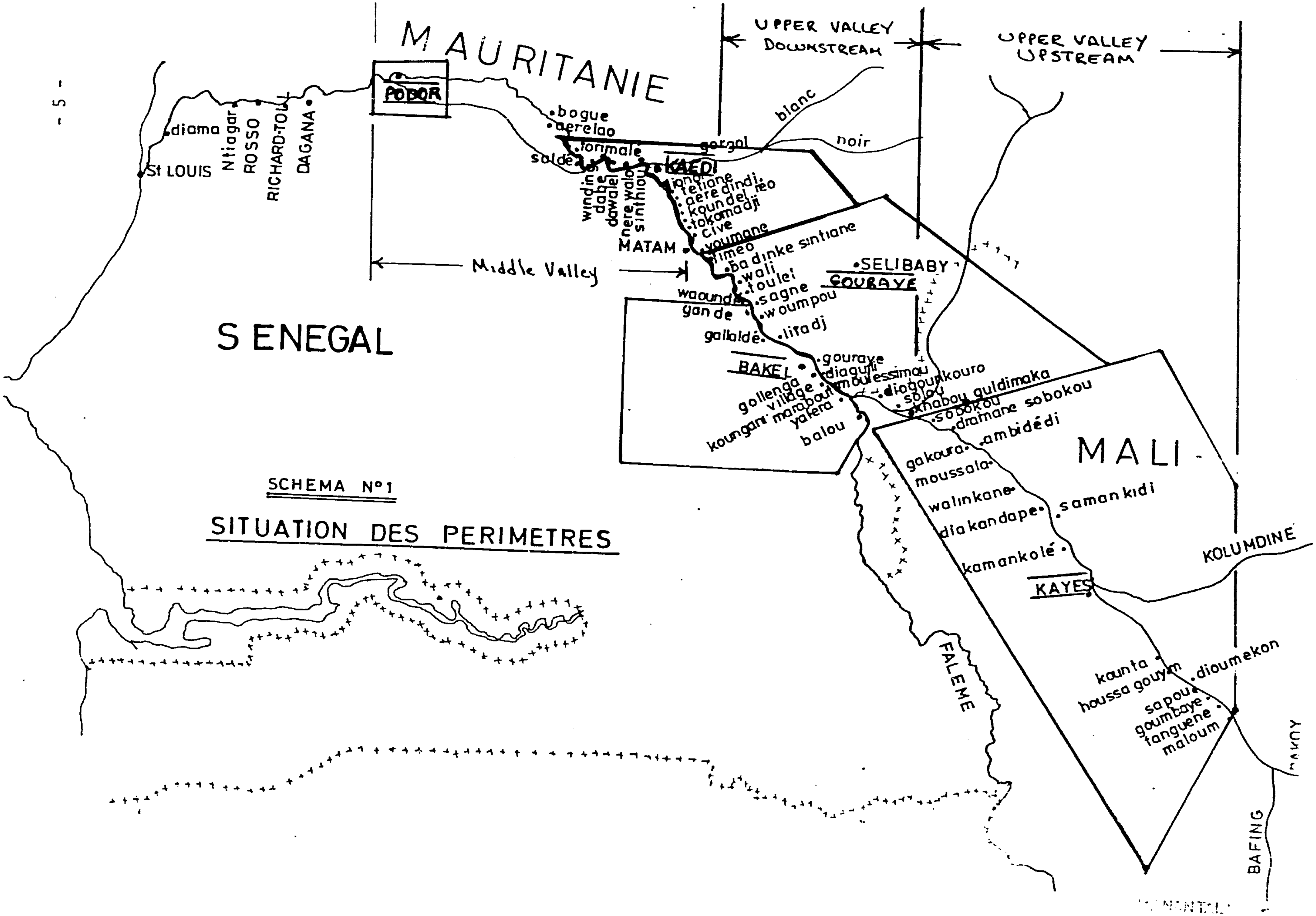
2.2. SOCIAL, CULTURAL, AND ECOLOGICAL CONDITIONS IN THE PROJECT ZONES

The project will be implemented in five zones which for the purpose of ecological-sociological analysis may be classified into three categories : The Middle Valley ; the Upper Valley Downstream, and the Upper Valley Upstream (1).

Category	Project Zones (Country)	Major Ethnic Group(s)
Middle Valley	PODOR (Senegal) KAEDI (Mauritania)	Tukulor Peul
Upper Valley Downstream	BAKEL (Senegal) GOURAYE (Mauritania)	Soninké
Upper Valley Upstream	KAYES (Mali)	Soninké Kassonkhé Malinké

The map on the following page outlines the project zones and identifies each of the towns and villages where the project will be implemented.

(1). Additional details on each zone and most villages are presented in section 2.8.6. (Social Institutional Analysis : Project Zone-level).



SCHEMA N°1

SITUATION DES PERIMETRES

2.2.1. The Middle Valley

The project zones in the Middle Valley are : Podor (Senegal), which includes the town and nearby villages , and Kaédi (Mauritania), where perimeters will be developed in 14 villages. This part of the Middle Valley is characterized by low rainfall (average : 320-420 mm/year), and the annual flooding of low walo lands on which flood recession agriculture is practiced. Because of the low rainfall, dryland agriculture is of secondary importance in this zone. The walo fields, however, are vital to the economic life of the village, and control over them is a major feature of the hierarchical village social system. The long-range plans to eliminate flooding of these lands will radically alter the local ecology and will change existing social patterns.

The largest ethnic group in the middle valley zones is the Tukulor, accounting for about 2/3 of the population, followed by the Peul, the Moors, the Soninké, and the Wolof. The charts below summarize the population figures and ethnic composition of the Podor and Kaédi zones.

PROJECT ZONES IN THE MIDDLE VALLEY

KAEDI (Mauritania)

Dominant ethnic group	Number of Villages	Total Population 1/	Percentage
Tukulor	11	16,802	85 %
Soninkè	0	1,304 2/	7 %
Peul	3	1,588	8 %
T O T A L	14	19,694	100 %

1. Based on SONADER Socioeconomic Study 1981.

2. This Soninké population is within the Tukulor village of Dioval and construction of a separate perimeter is planned for them.

PODOR TOWN AND ADJACENT VILLAGES (Senegal)			
ETHNIC GROUPS (Most numerous listed first)	SETTING	POPULATION	PERCENTAGE
Tukulor, Peul, Moor, Wolof.	Podor Commune	8,559*	56 %
Tukulor, Peul, Wolof	9 Villages	6,662**	44 %
T O T A L		15,221	100 %
* Based on GERSAR SOCIOECONOMIC STUDY 1982 ** 1976 Senegal Census			

Population density in the Podor zone is between 20 to 30 persons per square kilometer, while in the Kaédi zone along the river it is between 30 and 50.[1]

More than 80 per cent of the village population in both zones cultivates walo land, while less than one-third of the households in the town of Podor have access rights to flood recession land.

2.2.2. The Upper Valley Downstream

There are two project zones in this area : Gouraye (Mauritania) and Bakel (Senegal). The Bakel zone includes a medium-sized perimeter (Collenga) to be exploited primarily by residents of the town of Bakel, and the expansion of five village perimeters. This is a zone of moderate rainfall (500-700 mm/year) with a relatively narrow flood plain (approximately 2-8 kilometers) where recession agriculture is practiced. The walo lands are widest (between 5 and 8 kilometers) towards the west, and decrease to between two and three kilometers towards the east along both the Senegal and Falémé rivers. There is substantial variation in the economic importance of flood recession agriculture both between and within villages. Throughout the area, however, the interior djeri fields receive adequate rainfall and their cultivation is the principal agricultural activity for most of the population.

Approximately 85 percent of the population in the project zones

1. Population density figures are based on 1971 data. "Along the River" refers to the densely populated strip of land extending kilometers North and South of the Senegal River.

are Soninké. Other groups represented in significant numbers are the Tukulors, the Moors, and the Peul. The total population of the Departments of Bakel (Senegal) and Sélibaby (which includes Gouraye) is approximately 80,000, only about 30-35 percent of whom practice flood recession agriculture. The charts below summarize the population figures and ethnic composition in the two project zones.

PROJECT ZONES . UPPER VALLEY DOWNSTREAM

BAKEL ZONE (SENEGAL)			
Ethnic Groups	Setting	Population[1]	Percentage
Soninké	Bakel town (Commune)	5,281	85 %
Others (Tukulor, Bambara Peul, Moors, Wolof).		932	15 %
Subtotal(a)		6,213	100 %
Soninké	5 villages	5,814	95 %
Others (Peul, Moors, Tukulor)		306	5 %
Subtotal (b)		6,120	100 %
Bakel Commune and 5 villages : Total:		12,333	100 %
(Approximately 90 % of the population of the zone is Soninké)			
1. 1976 SENEGAL CENSUS.			

GOURAYE ZONE (Mauritania)			
Ethnic Group	Setting	Population	Percentage
SONINKE	7 villages	15,243*	74 %
TUKULOR	5 villages	5,083	25 %
PEUL	1 village	191	1 %
T O T A L	13 villages	20,517	100 %

* 477 Soninké who reside in a Tukulor village (Sagné) are included in this total. In all other zone villages the ethnic composition is very homogeneous.

Population density in the riverine area (5-8 kilometers on each side of the river) to the west of Bakel ranges between 30 and 60 persons per square kilometer. To the east, the density decreases to between 15 and 45 inhabitants per square kilometer. The most densely populated areas are those within two or three kilometers of the river and this decreases dramatically as one moves to the interior. Twenty to twenty-five kilometers to the north and south of the river, the population density is normally less than five persons per square kilometer.

An important demographic characteristic of the region is the absence of adult men in Soninké villages. A large proportion of adult men migrate, mostly to France. Some leave for just a few years while others are absent for periods ranging from 10 to 20 years. They maintain strong ties to their villages, however, and send significant amounts of funds to their homes, which are used to purchase agricultural labor, food, buildings, and other material goods. In villages where substantial numbers of men have returned, they constitute an important group through which development activities can be channeled.

Although the cash sent by migrants partially offsets the loss of productive labor, both the amount of land and diversity of crops cultivated has diminished. Women have been especially affected by this trend. They are now required to spend larger amounts of time in cereal crop production and less time in their traditional cotton, rice, and indigo fields.

2.2.3. The Upper Valley Upstream (Mali)

The Kayes region of Mali has a relatively high annual rainfall (700-900 mm). The annual floods which are vital to the agricultural production in the Mauritanian and Senegalese portions of the river, cover only a narrow strip of land west of the city of Kayes. There is, therefore, little walo land, although flood recession farming occurs on the narrow bands of fondé and falo lands and is considered valuable by the local population.

Rainfed agriculture and herding are the principal productive activities in the Kayes zone. Although irrigated perimeters have existed in the area for about a decade, the high rainfall diminishes the necessity for irrigation in the rainy season and, except for a few villages, the local demand for perimeter construction and expansion is moderate. The main interest is in dry season irrigation which provides a welcome source of cash and fresh vegetables. To contribute to the economic development of villages in this zone, the project will need to maintain a broad intervention strategy directed at the full range of productive activities,. transportation and marketing.

Villages to the west of the city of Kayes are primarily Soninké, while those to the east are Kassonkhé The Kassonkhé are people of Peul origin who established the Kingdom of Khasso among a Soninké population, and developed a culture blending elements of both. Herding activities remain important to the Kassonkhé villagers. Other groups represented in the zone include Mandinké, Peul, Bambara and Tukulor. In the Kayes region, villages are located both along the river and in the interior close to the road network that links Kayes to other population centers. The total population of the region is about 120,000 and includes the city of Kayes which has approximately 40,000 inhabitants, The riverine population between the villages of Maloum and Soboukou is about 35,000. The chart below presents some of the major features of the 15 villages in project zone using 1976 census data.

KAYES PROJECT ZONE POPULATION[1/]

Location	Number of villages	Population	Percent of total	Estimated composition by ethnic group
Kayes Downstream	8[2/]	10,086	78 %	Soninké 80 % Kassonkhé, Malinké, Bambara, Peul, Tukulor 20 %
Kayes Upstream	7	2,776	22 %	Kassonké [3/] 56 % Malinké [3/] 16 % Peuls [3/] 9 % Soninké, Bambara, Tukulor 19 %
Kayes Project zone : TOTAL	15	12,862	100 %	----------

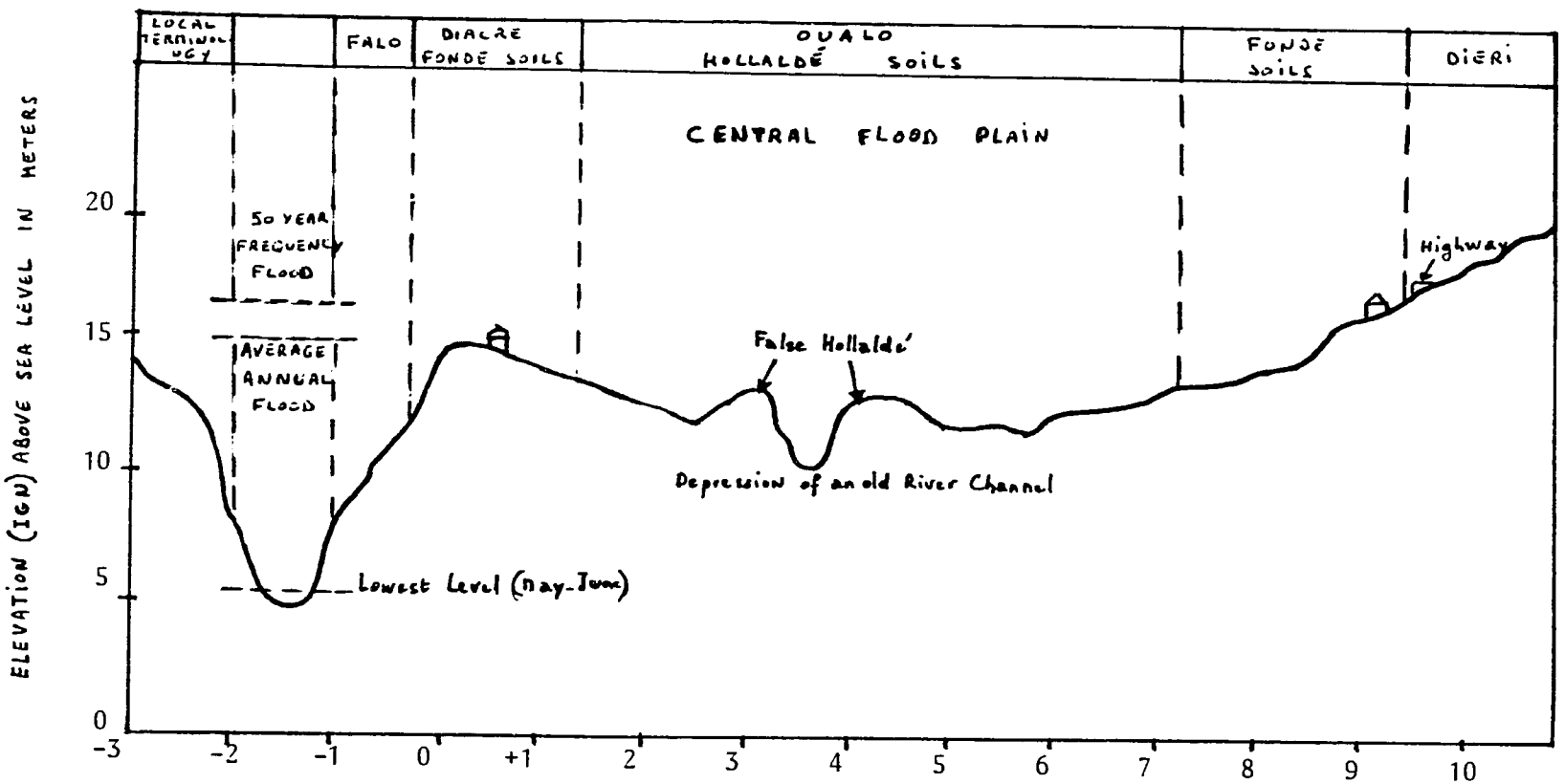
1. Recensement Général de la Population. Déc.1976. V.III. Répertoire villages. Ministère du Plan, Direction Nationale de la Statistique et de l'Informatique. Bamako.

2. There are two sites listed for Diakandape.

3/Résultats d'Enquêtes Agro-socio-économiques de Maloum-Kounda. Institut d'Economie Rurale (IER). Bamako, 1978.

The chart below summarizes the principle ecological economic and sociocultural characteristics of the project areas.

Profile of the Flood Plain at Matam: Classification of Soils and Use



Profile of the Floodplain at Matam

Type of Land		Falo	Diacre Fondé Soils	Oualo Hollaldé Soils	Fondé Soils	Diéri
Present use	River Bed	Corn, beans, Vegetables	Town site, Irrigated perimeter Rice, corn, vegetables	Sorghum, millet corn, cowpeas	mostly brush or forest uncultivated	rain-fed millet

CHART SA1

ECOLOGICAL-SOCIOCULTURAL FEATURES

SUB-REGION (Project Zone)	MIDDLE VALLEY	UPPER VALLEY DOWNSTREAM	UPPER VALLEY UPSTREAM
Project zones	.Podor (Senegal) Medium-large perimeter (1000 ha +) .Kaédi (Mauritania) village perimeters	.Bakel (Senegal) - Medium Perimeter (town) - Village Perimeters .Gouraye (Mauritania) Village Perimeters.	.Kayes (Mali) - Village Perimeters - Rainfed depressions with development potential.
Ecology	.Low Rainfall (320-420 mm/year) .Extensive annual flooding of good agricultural land (walo).	.Moderate Rainfall (500-700 mm/year) .Annual flooding of walo lands- less walo than in Middle Valley	.Moderate to high rainfall (700-900 mm/year) .Very little flood recession land. .Rainfed depressions (cuvettes).
Agricultural Activities	.Flood recession cultivation most important .Some river bank (Falo) and sandy ridge (Fondé) cultivation .Dryland farming (limited because of low, irregular rainfall.	.Fondé and Falo fields .Dryland (Djeri) farming .Flood recession farming on chay (Hollandé) soils	.Dryland agriculture .Cultivation of rainfed depressions .Sandy soil (Fondé) and river bank (Falo) cultivation .Flood recession agriculture on hollandé soils where they exist.
Livestock Activities	.Part time, complementary herding of cattle and small ruminants practiced by sedentary populations. Presence of full time pastoral groups (Peuls and Moors) who also take care of animals belonging to farming populations.		
Other Economic Activities	.Public Sector employment (Podor) .Private Sector : wage labor and commerce	.Commerce .Wage labor (migrants to France and urban areas).	.Commerce .Wage labor (migrants to France and urban areas). .Construction specialists
Ethnic Groups Principal --- Others	TUKULOR 65 % + --- Wolof, Peuls, Maures, Soninké.	SONINKE (85 % +) --- Tukulors, Maures, Peuls.	SONINKE (60 % +) --- Kassonké, Mandinke, Bambara, Peuls.
Zone Specific project issues	.Podor : - Social Organization of irrigated system - Supply of labor - Land Rights of villagers and townsfolk. .Podor and Kaédi . - Expansion of irrigation to flood recession land - Land tenure and traditional authority systems - Eventual loss of flood recession (walo) land.	.Bakel : social organization of medium sized town perimeter .Bakel & Gouraye - Land tenure - Organizational needs of expanded perimeters - Labor supply - Organization of farming activities to permit effective and efficient exploitation of dryland and flood recession farming.	.Developing an integrated-dryland farming strategy .Adapting irrigated production activities to farmers needs and local market conditions. .Labor supply. .Social organization and land tenure issues on rainfed depressions to be developed.
Other Project Issues	.Development of a strategy to integrate pastoral populations into irrigated agriculture projects. .Adapting animal traction techniques to irrigated perimeters, .Developing a general approach to resolving land tenure issues .Increasing farmer participation in all phases of project operations. .Women's participation in development activities and their access and rights to resources.		

2.2.4. Settlement Patterns in the Senegal River Basin

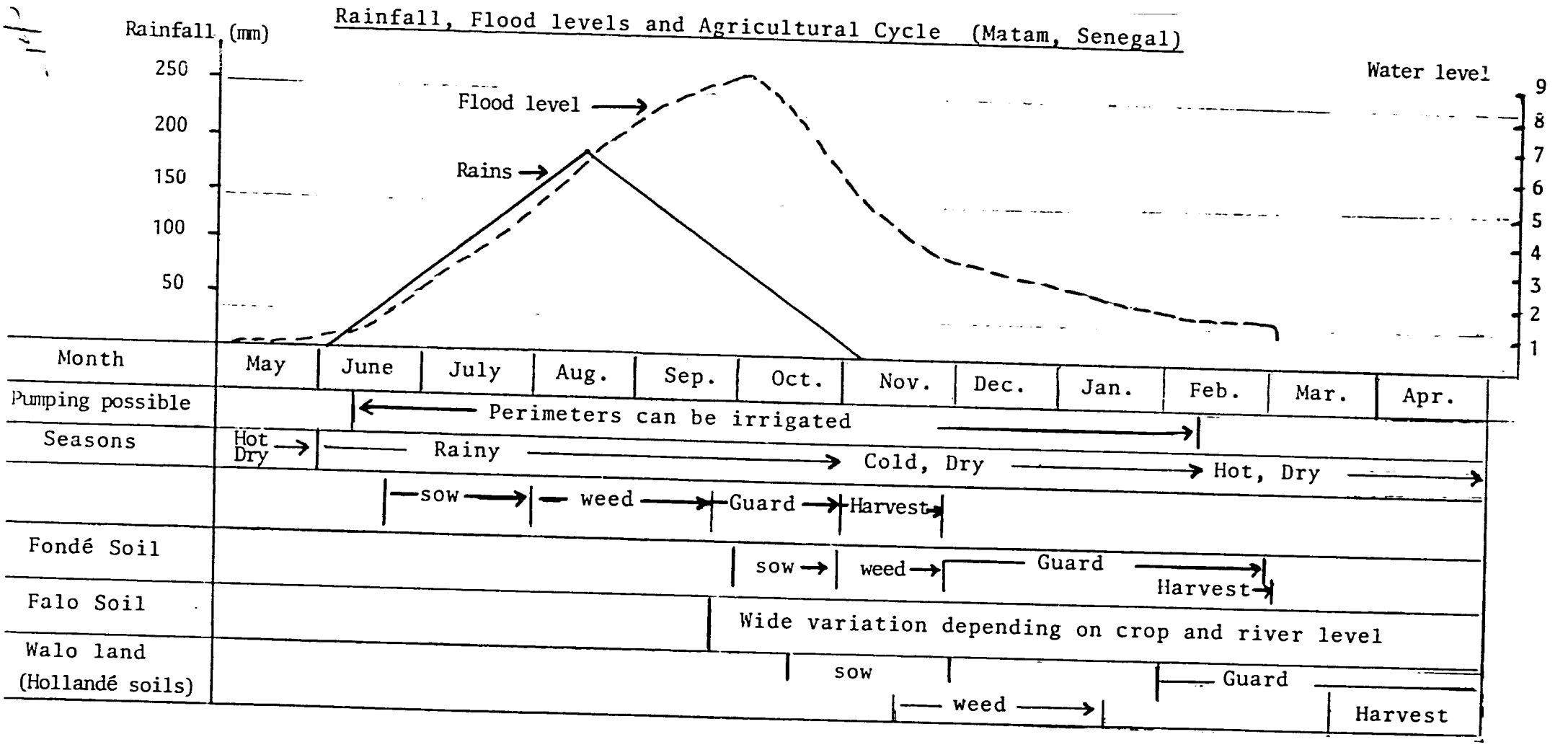
Residential settings in the Basin include : large, ancient Tukulor and Soninke villages ; the cities of St.Louis, Podor, Kaédi, Matam and Kayes which became important administrative and commercial centers during the colonial period : small, post-drought hamlets inhabited by Peul herdsmen who now mix farming with traditional herding activities; and, seasonal tented camps of the tribally organized Haratin (Black Maures) and Bidan (White Maures). The urban centers range in population from about 100,000 in St.Louis (Senegal), to 40,000 in Kayes (Mali), 30,000 in Kaédi (Mauritania), and less than 10,000 in Bakel (Senegal).

The largest villages in the project zones are those inhabited by the Soninké. They are characterized by well constructed homes and mosques built closely together and divided into neighborhoods (quartiers) which in larger towns tend to reflect social divisions. They range in size from about 1500 inhabitants to over 6000 in the largest villages. Tukulor villages in the project zones exhibit an architectural style similar to the Soninké but compounds are spaced much further apart and both compounds and villages have a smaller number of residents --usually between 400 and 1800 persons in a village. Adjacent to and scattered between the larger Soninké and Tukulor villages are clusters of smaller, less permanent looking, straw-roofed dwellings, inhabited by recently settled Peul herders. They are grouped into hamlets that rarely exceed 300 residents and are sometimes surrounded by flimsy fences made from thorn-filled branches. Towards the end of the dry season, from March through May, transhumant Peul and Moor families establish temporary residence in the river basin.

The density of the population within 4 to 5 kilometers along both sides of the river is often very high --30 to 50 persons per square kilometer. This decreases rapidly as one moves into the interior where there are some small villages but where the population density averages less than 5 persons per square kilometer.

2.2.5. Ecological Patterns and Land Use in the Project Zones

The agricultural and pastoral patterns in the project zones should be viewed within the topographical and pedological context of the basin and the annual cycle of rainfall and floods. The diagram below presents a cross-section of the river near Matam (Senegal) which is approximately the midpoint between the western (Podor) and eastern (Kayes) project zones. It includes a chart with local terms for classifying different types of land and indicates their principal uses.


Rainfall, Flood levels and Agricultural Cycle (Matam, Senegal)
Rainfall (mm)
250
200
150
100
50
Water level
9
8
7
6
5
4
3
2
1
Flood level
Rains
Month
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
Pumping possible
Perimeters can be irrigated
Seasons
Hot Dry
Rainy
Cold, Dry
Hot, Dry
sow
weed
Guard
Harvest
Fondé Soil
sow
weed
Guard
Harvest
Falo Soil
Wide variation depending on crop and river level
Walo land (Hollandé soils)
sow
Guard
weed
Harvest

The ecological differences between project zones are a function of topographical and pedological conditions and the annual cycle of rainfall and flooding. These variations are summarized below.

Ecological area	Project zone	Rainfall	Width of Walo
MIDDLE VALLEY	Podor	300-350 mm per year	20-25 kilometers
	Kaédi	300-500 mm per year	0-4 kilometers on Mauritanian side (10-20 kilometers on the Senegal side.
UPPER VALLEY DOWNSTREAM	Bakel	500-700 mm per year	1-2 kilometers
	Gouraye	500-700 mm per year	2-4 kilometers
UPPER VALLEY UPSTREAM	Kayes	700-900 mm per year	1-3 kilometers to the west of Kayes none to the east.

Rains begin in the Upper Valley in May and average between 100 and 160 mm a month between July and October. In the Middle Valley they begin in June and average over 100 mm a month between July and September.

The interior (djeri) fields are planted at the beginning of the rainy season and are harvested between the end of October and November. Between 40 to 60 days after the rains peak, the flood reaches its highest level and begins to recede. The flood recession (walo) lands are planted in October and November, and crops are harvested four to six months later. Gardens along the river bank (falo land) are cultivated as the river flow diminishes and produce small quantities of vegetables into March and April. Irrigated agriculture is possible soon after the rains begin in the Upper Valley and in all the Delta Region, a second irrigated crop may be sown in November-December, the beginning of the dry season. The chart below shows the pattern of major agricultural activities in relationship to the annual rainfall and flood cycles.

2.2.6. Land Tenure

The existing land tenure system of the river region is complex, yet flexible in terms of patterns of land use and cultivation rights of limited duration. The following is a brief summary of land tenure patterns that are discussed in detail in Part IV, (Section 2.9.), (Land Tenure and Irrigated Agriculture in the Senegal River Basin).

Traditionally, collective family ownership is the predominant pattern throughout the river valley, even for the most valuable walo lands. The relatively abundant jeri fields are available to all, although newcomers and low status people may find their fields distant and/or otherwise less desirable than those of the prominent families. Walo fields are scarcer, inherited and subdivided within patrilineages, and in some communities have become severely fragmented into small plots. Ownership is not confined to the nobility ; fishermen families often are well endowed with walo lands. Many low status families, however, are obliged to rent, share-crop, or work on the fields of their patrons.

Villages also have a territoriality, which no chief has the right to change. Often village lands are on both sides of the river, and include a mix of djeri, walo, and falo lands, plus grazing, forestry, and well-digging rights. Some villages have little or no land, while others have more than they can use and may lend it on negotiated conditions. They resist irrigation by others, however, for fear of losing land rights completely.

Inalienability of land is a very strong principle in this practice of group ownership. It operates from the bottom up. No head of family, clan, or village can cede his group's rights, nor can any higher authority expropriate them by any means other than force or fiat. Land controlled by the eldest male of an extended family group and usufruct rights are allocated to younger males in the compound and household. Women do not usually inherit land, although they are entitled to by Islamic law. The head of household usually allocates individual fields to the women in the household.

2.2.7. Social Stratification

The major ethnic groups in the region are all characterized by a system of stratification that divides people by birth into different castes. There are three major social categories : freeborn, artisan castes, and slaves (including resident ex-slaves), and each category is divided into several sub-groups. Members of these castes often have usufruct rights to some walo lands and all have the right to cultivate djeri land.

Ruling families control villages as well as land, and their economic and political status , especially in the Middle Valley, will be significantly affected as flood recession agriculture is eliminated.

The lowest stratum in the traditional system is made up of slaves and ex-slaves originally of ethnically diverse groups who were integrated into their master's families and inherited along with other property.

The chart below outlines a general model of hierarchical classification and types of social groups common to the river basin societies. It is a general outline and more detailed information is contained in the ethnograpric literature for each ethnic group.

OUTLINE OF SOCIAL CLASSIFICATION AND STRATIFICATION	
SOCIAL CATEGORY	PRINCIPAL SOCIAL GROUPS AND CASTES
Upper Stratum	Nobles, politicoreligious leaders, religious functionaries, warriors, cultivators (fishermen in Tukulor society).
Artisans (Specialized Castes)	Metalworkers, weavers, leatherworkers, potters, woodworkers, praise singers (griots), (fisherman in Soninké society).
"Non-Free", Captives	Ex-slaves, slaves.

Although slavery has officially been abolished, it continues in modified form in some areas, and persons of low origin often provide a major portion of the agricultural labor force on lands controlled by land owning families. The land poor families have, however, responded positively to opportunities provided by recent changes and have moved into towns and cities, finding employment in the modern sector and establishing independent farm households.

While education and economic change has altered the economic relations between strata, hierarchical considerations are still important in social affairs, especially marriage.

For the purposes of project implementation, an understanding of the ethnic composition and precise pattern of social hierarchy is necessary for several reasons. First, within the larger schemes of Bakel and Podor, as well as in some villages several ethnic groups are represented. Since ethnicity and social status are a crucial component of personal identity and social relations, actions which attempt to modify existing patterns and/or create new forms of organization have the potential for creating conflict. Failure to consider the cultural and social dimensions of irrigation schemes have frequently led to problems in the organization and management of irrigation works.

Second, each group has its own pattern of social stratification, different rules for land tenure and usufruct rights, and its own system of dividing labor and organizing work. Among the Tukulor, for example, the noble classes (Torobe) do not traditionally engage in agricultural activities, whereas among the Soninké, everybody --noble and slave, young and old, men and women -- works the land.

Third, even in villages that are ethnically homogeneous, there are significant variations in the composition of social groups --percentage of nobles, fisherman, artisans, slaves etc.-- and the pattern of land tenure and use. Some villages have a high percentage of high status, noble families whose land is tilled by "captives". Other villages of the same ethnic classification, may consist primarily of fisherman, who own and work the land, and members of artisans castes. An awareness of these differences and how the function in each situation is necessary if the project is to avoid past errors and develop an approach which is sensitive to the sociocultural situation at each village site.

2.2.8. The Social Organization of Production

Agricultural activities and herding may be practiced by any member of the community owning animals and having access to land (either owned, purchased or rented). Authority over the common property of the extended family resides with the head or the senior male member. His decisions, however, are limited by rules governing the distribution of property and the principle of "inalienability" of family lands.

The fundamental production and consumption unit among the Tukulor and sedentary Peul is the household (foyer). Households are part of extended-family units, within which immobile property and the fruits of production are distributed. Household sizes vary widely throughout the area and among the Tukulor usually have between 7-14 individuals.

In contrast to the relatively small production units among the Tukulor, Soninké families frequently include 20 to 30 individuals (ka). These families are collective production and distribution units made up of several matrimonial households sharing a single compound. Land controlled by these groups is farmed collectively and individually. Soninké women often control their own parcels of land.

In spite of similar principles of social stratification and the inalienability of village and lineage lands, there is a sharp difference between the Tukulor and Soninké in regard to the organization of agricultural production and other patterns of work. Among the Tukulors, the noble classes do not work the soil and, in general, show a disdain for any form of manual labor. In contrast, the work ethic is strong among all Soninké, regardless of age, sex or social status. Futhermore, it is normal for male Soninké adolescents to work outside the village to acquire post-circumcision feast attire, and later to migrate to urban areas and work in manual jobs for many years before returning to their village. Lucie Colvin's paper, Out Migration and Rural Development in the Senegal River Basin, prepared as part of this project paper, covers this issue and its relationship to irrigated

agriculture.

In addition to the work performed by members of the household and extended-family, there are other ways of organizing labor and getting a return on land owned by the lineage. Among the Tukulor the owner has the right to impose several types of fees and taxes on those who wish to use his land. He may also use one of a series of sharecropping arrangements which result in his receiving either :

- assakal, one-tenth of the crop (theoretically the religious tithe)

- rempetien, one-half of the harvest

- thiogou, a lump sum of money or goods plus the annual ten percent tithe for a period up to ten years.

Most valuable agricultural land in Soninké villages is effectively controlled by a few noble families, who in most cases are descendants of the founders of the village Thus, a large proportion of the residents have, in relation to the soil they till, only usufruct rights granted by the head of the family which controls land allocation. The usufruct rights are often permanent but the tenant pays an annual "fee" which may be a small, token payment or up to one-tenth of the harvest. This system is also used on land that is loaned for a one to three year period.

Other forms of "leasing" land are less a function of traditional social relationships and more closely follow a pattern of commercial exchange. The most common arrangement is to lease a parcel of land for one agricultural season in exchange for one-third of the harvest, or for a half, if the owner provides the seeds.

Throughout the basin, wage labor, as well as traditional types of leasing arrangements also occur on irrigated perimeters.

During the initial phase of perimeter development, the RDA's introduced regulations to encourage owner-cultivation and eliminate some traditional labor arrangements viewed in some quarters as vestiges of an inefficient, class dominated system. This has proved impossible to control, and while the project should be concerned with assuring equitable access to irrigated land, the organization of labor to farm the perimeters should be left to the participants.

2.2.9 Women's Roles[1/]

Women in the river basin societies are, with the exception of high status Moor females, involved in both domestic and household production. The "domestic" sphere refers to those women's duties

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1/ Much of this summary is based on information in Melinda Smale's report WOMEN in Mauritania : the Effects of Drought and Migration on their Economic status and Implications for Development Programs. Distributed by the Office of Women in Development, A.I.D. 1980. This is an excellent report and a valuable document for the project implementation teams.

concerned with maintenance of the household labor force and its reproduction-- food preparation, child care and household maintenance. 'Household' production includes economic activities that support the extended family as well as some which contribute to the well being of the community.

The Tukulor and Peul women are domestic and household producers. They contribute some labor to the production of grain crops and play a secondary but complementary role in maintaining livestock. Women sow, guard, weed, harvest, and process grains for consumption or sale and, among the Peul, care for the weak and sick animals of the household herd. Although women do not possess significant capital in the form of land or herds, they have control over revenue generated by a secondary set of activities which include vegetable production, some herding, milk and butter production. The proceeds from these activities are her principal source of income and critical to her self-esteem and status among women. These women's activities are available to any Tukulor or Peul women whose family possesses the required land and/or livestock and are not limited to specific social levels, castes or groups. Women in these societies also form mutual aid groups among themselves in order to increase revenues and multiply savings.

The Soninké women are cultivators and their self-esteem is derived from their agricultural skills. Men and women rarely work in each others fields, their activities are complementary --men provide the cereal grain staples and women, the vegetables, spices, etc. Soninké women often perform agricultural tasks together, and cooperate in savings and investment.

In Moor society women's status is reflected in the level of ther inactivity. The higher status women are limited to the managerial roles in the domestic sphere, while those of lower status possess agricultural and livestock skills.

The pattern of male migration from the region which began during the colonial period and accelerated during the drought, had a significant impact on the role of women in Tukulor, Peul and Soninké societies.1/ The decrease in the adult male population in villages increased pressure on the female labor supply, who along with the remaining adult males, children and servile laborers, have greater responsibility for the cultivation of household fields. The use of migrant agricultural laborers, paid in cash, has also increased. Neither Tukulor, Peul nor Soninké women, however, become managers of their households since before leaving men arrange with other men in the extended family to take responsibility for household decisions. Furthermore, while women's agricultural production increased, their actual income has declined relative to the men who are wage earners in urban settings.

Women have adapted to the changed conditions in several ways. The Tukulors and Peul women have increased their production on the small river bank (falo) fields which during the drought were an

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1/ Colvin's report in this Project Paper provides additional details of this outmigration and its impact on social and economic life in the basin. Outmigration and Rural Development in the Senegal River Basin.

important source of food. Soninké women responded by shifting the composition of their fields from groundnuts to grains which they sell to meet the rising costs of other goods they need. The cloth weaving and soap-making activities traditionally performed by Soninké women have, however, declined because of the decrease in cotton, groundnut and indigo yields, and the import of manufactured substitutes. The altered social conditions have increased the burden on women, yet because of the lower profitability of these activities they are increasingly dependent on migrant remittances and some now leave their villages.

In villages where irrigated perimeters have been constructed, women are involved in cultivating the fields. In the Middle Valley and among the Tukulor, women's activities on irrigated plots follow traditional patterns in which men do the bulk of the heavy work and women assist in planting, weeding and harvesting. They also frequently establish gardens on fields adjacent to the irrigated land. In the Upper Valley women often constitute the majority of the labor force on irrigated perimeters, even though rights to the land and decision-making within the perimeter association are controlled by the men. If the project can increase women's access to perimeter land and their participation in group decisions, they should be able to derive substantial economic benefits from irrigated agriculture.

2.2.10. Authority and Leadership at the Village Level

Villages in the basin are relatively autonomous and are cohesive political, social and economic units. The authority of village leaders and the system of recruitment are strongly rooted in traditional social and cultural norms and reflect principles of social hierarchy and land ownership. The authority of traditional village leaders is recognized by the state. Politics is men's business and women play no direct role in the management of village affairs. Village authorities negotiate for the residents in matters involving national institutions and their representatives.

Village political and religious leadership is the prerogative of the freeborn families. In Soninké society, the position of the village chief is always held by the oldest male member of a ruling lineage and succession occurs according to the rules of primogeniture. Among the Tukulor, chiefs are normally from the descendants of the family that originally established the village. Participation in the discussion and debate of issues is usually open to heads of extended family of freeborn groups. Important village decisions are made, however, by smaller groups composed of the heads of the land owning noble families. Casted and ex-slave groups have their own internal organization and leadership.

Leaders of the village and of social groups within it are able to effectively enforce decisions once they are made. For the purposes of the project, village chiefs and councils represent

the village during early phase of negotiation and must be involved in all stages of implementation.

In addition to the local political-administrative structure, the marabouts, hereditary religious leaders, play a very important role in village affairs. In larger villages there are often several marabouts and mosques, each of which serves a particular social group or groups. These religious leaders traditionally have substantial popular support as spiritual guides and often use their influence in political and economic affairs. Many marabouts control large tracts of land and have a steady supply of agricultural labor provided by their koranic students.

2.2.11. Age Groups

Cross cutting the stratified social levels are male and female age groups. While these groups have their own management structure, their internal divisions reflect the hierarchical pattern found in the larger society --its leaders are always drawn from members of the ruling families. They function primarily in ceremonial and ritual contexts and do not, as in other African societies, constitute cooperative work or rotating credit groups.

2.3. REGIONAL SOCIAL ISSUES

For the people of the basin, the Senegal river has been an avenue rather than a border. Social, political, and economic ties link people and settlements on both sides of the river.

Families and villages control land on both sides, segments of extended families have north and south bank resident branches, people shift residence from one side to the other. There is a continual flow of people, goods, and information across national borders. During the colonial period, residents of the three countries were jointly administered and shared a common currency tied to the French Franc. Following independence and the establishment of three nations, however, several major developments disrupted social, political, and economic integration of the region. Border related tensions have increased during the past two decades as residents on each side have begun to identify themselves as Mauritanians, Malians, or Senegalese and as government officials have implemented policies giving its citizens preferential rights to national resources.

The divisive national economic and administrative policies that are currently operative in the valley are likely to be exacerbated by development activities and thus merit the urgent attention of OMVS member States. The following are some of the socio-economic issues which require immediate consideration.

2.3.1. Land tenure rights across borders

The land tenure pattern in the SRB has deep historical roots, and lands controlled by villages and families are found on both sides of the river. While traditional rights of citizens in one country owning land in another are often recognized, there are cases where citizens of one country have been obliged to discontine farming across the border.

Land reform policies and the increasing economic importance of riverine lands also cause conflicts that require coordinated international solutions. These problems are especially pressing as irrigated perimeters are expanded along the river banks and into the fertile walo land. In some villages, resistance to irrigation can be traced to fear of losing land rights. The project recommends a full-scale study to assist the governments in surveying and registering claims to land throughout the basin, and the immediate registration of rights before and after the construction of irrigated perimeters. It also suggests that all land-related disputes be negotiated and resolved as a condition for project implementation.

2.3.2. Migrant labor across borders

The migration of adult men, especially the long absences of villagers from the upper valley, has increased the need for agricultural labor. Irrigated agriculture requires high inputs of manual labor, and the recruitment of migrant workers is often necessary to assure production. The free flow of manpower across national boundaries will contribute to the growth of agricultural development and measures to assure the economic and social rights of these workers are needed.

2.3.3. The integration of foreign immigrants into villages

To accelerate the development of agriculturel land on irrigated perimeters, RDA's have invited "outsiders", including non-nationals, to participate in these projects. They have been integrated into large perimeters and, in some cases, been given assistance to form their own cooperatives on land belonging to an established village. In addition, there are instances of returned migrants, including some non-nationals, acquiring land and forming cooperatives without the participation of local villagers. The activities of these returned migrants, and "foreigners", have sometimes led to serious disputes. More effective international and national policies are needed to promote the participation of returned migrants, while at the same time protecting the rights of local villagers.

2.3.4. The herding populations and movement of livestock across borders

The physical changes resulting from the regularization of water

flow, and the construction of dikes and perimeters, will have a major impact on the local ecology and livestock grazing patterns. The transhumant strategies of Fulani pastoralists have already been seriously affected by the drought and decreased flood levels which have effectively eliminated most of the old walo pasture lands. Some herders have moved to djeri villages and others have joined irrigation schemes.

One major recurrent problem is the crop damage caused by livestock. Control over the animals' movements is even more important in villages with irrigated perimeters, and damage to irrigation canals is a frequent source of conflict. The disputes tend to be more serious when the animals belong to "foreigners".

Dam construction will result in the year round water flow in the Senegal River. This will reduce, and in some areas will eliminate, the decrease in water levels which permit seasonal crossings to traditional watering spots. Both short-and long-distance pastoralists now take their herds to and across the river at precise times and places, as do sedentary farmers moving their animals to seasonal pastures. The extent to which dam construction will affect this pattern is difficult to predict, and it is an issue which demands attention.

The growth of irrigation implies the availability of more by-products suitable for livestock, but at the same time hampers traditional movements, manuring, and grazing rights. Irrigation will also accelerate the evolution from transhumant nomadism to sedentary, mixed farming. Because sedentary families generally have more secure land rights than pastoralists, they will probably make this transition more easily. This implies that those who now live primarily from pastoralism should receive special attention, including extension work directed at integrating them into the river basin development programs.

2.3.5. Fishing rights and the fishing population

Fish, along with milk, is the major source of protein in the diet of the inhabitants of the river valley. The Gannett-Fleming ecological study showed that the dams will shift the supply of fish substantially between different zones of the river, and may cause great damage to brackish water breeding grounds of ocean species. Fresh fish will diminish in the middle valley and increase in the dam reservoirs of the Delta and Manantali.

As in the case of livestock, an economically viable alternative source of fish through fish farming is available and being introduced. There are, however, neglected socio-economic aspects which deserve continued attention and regional coordination.

Fishing is a caste specialty of the Cubalbe, who live primarily from fishing (but also farm) and who migrate great distances seasonally in pursuit of their profession. Will their boats be

able to get readily past the Diama dam into the ocean as they do now ? Will fresh water fish supplies behind Diama and Manantali generate revenues comparable or better than in the past, or will their situation deteriorate ? Will the Cubalbe predominate in fish farming, or will it become an occupation open to anyone, thus reducing their special economic position ? Fish farming will be introduced along with irrigation as part of an integrated economic approach, but simultaneously the particular situation of the Cubalbe needs study and assistance. (A lock for shipping is included at Diama dam).

2.3.6. Conclusion

Attention to the economic and social problems of the people of the SRB is needed now, and will become increasingly urgent as dam construction and development programs are implemented. The legal framework for harmonization of international policies and development strategies exists in the CEAO treaties and the OMVS mandate. More effective policy and program coordination is, however, urgently needed and must be integrated into the rural activities of the RDA's and political-administrative institutions at the national and local levels.

35a

PART II

PROJECT IMPACT AND STRATEGY FOR PARTICIPATION, EQUITY AND BENEFIT DISTRIBUTION.

2.4. Project Impact and Sociocultural Compatibility

2.5. Strategy for Village Participation and Distribution

2.6. Organization and Phasing of Zone Level Project Activities.

2.7. Special Issues in Project Implementation.

2.4. PROJECT IMPACT AND SOCIOCULTURAL COMPATIBILITY

The impact of project activities should be viewed in the context of the impact of the dams. In the Middle Valley, the eventual elimination of flood recession agriculture will have a deep and varied impact on social, political, and economic affairs. In the Bakel and Gouraye zones, the impact will be serious but less severe, and in the Kayes zone, the ecological and socio-economic effects of the dams will be even less disruptive.

The period of time in which the project will be implemented must viewed within the changing economic and ecological conditions introduced during the colonial period, accelerated by independence and the drought, and which in some areas, will change dramatically after the dams are completed. In this context, the balance sheet on project interventions is highly positive.

To begin with, throughout most of the basin, irrigation has been sucessfully introduced and farmers demand for additional perimeter construction is strong. This expansion is of particular urgency in the Middle Valley and in some villages in the downstream part of the Upper Valley where the annual flooding of walo land will eventually be eliminated. Throughout the basin, farmers want to learn how to take better advantage of opportunities provided by irrigation and are interested in other means of increasing productivity and production.

Perhaps the most important feature of the project is that it is based on a thorough review and analysis of past experience. While even the massive documentation on the basin does not indicate how each issue can be solved, the issues themselves are clear and are addressed in both the overall project strategy and some specific interventions. This is not to imply that all issues have been or can be resolved before implementation. Some, such as land tenure, women's access to benefits and strategy for meeting the development needs of pastoralists, require additional collaborative research, prolonged negotiations and pilot interventions before adequate solutions are developed. Other issues such as increasing the participation of the landpoor, improving the technical and managerial skills of farmers, and redefining the organizational relationships between farmers and government authorities can more easily be dealt with. The paragraphs below examine the impact of the project on key issues and social groups and indicate how the interventions will seek to minimize problems and maximize benefits. Many of these topics are discussed in greater detail in the sections on project implementation.

2.4.1. Land Tenure [1]

The long range development plan for the Middle Valley calls for the expansion of irrigation on fondé lands along the river bank and their eventual extension to walo lands. The introduction of the first generation of small perimeters has proceeded smoothly, primarily because of the relatively low value of the fondé lands and the high level of material support provided by the RDA's.

1. For an extensive discussion of land issues see Section 2.9, Land Tenure and Irrigated Agriculture in the Senegal River Basin.

Fondé land for village perimeters has generally been donated by the owning families. Increasingly, however, the acquisition of land rights is creating serious problems for RDA's. Expropriation of the land for large perimeters has provoked serious conflicts, and in some cases, villages have successfully resisted government efforts to appropriate their land.

A national land reform law in Senegal (1964 Loi sur le domaine national) provided the legal basis for expropriation for development purposes in designated zones in that country. Mauritania (1960) and Mali (1973) have similar legal provisions concerning "unused" lands, but recognize traditional claims to village land. Expropriations have usually been contested, and governments in all three countries are looking for more effective and acceptable procedures.

Project interventions can contribute to minimizing land tenure problems by : (1) assisting the governments to develop a system of land registration and compensation for land permanently taken out of production. At present, no such mechanism exists, and governments are obviously reluctant to implement a strategy that might add significantly to development costs. Any strategy for expropriation and/or redistribution of land requires full information on current tenure patterns and practices. Research activities supported by the project will help provide this information ; (2) by clarifying traditional rights through the negotiation and registration of rights and obligations before and after irrigated perimeter construction. This move will contribute to :

- developing a basin wide land tenure research methodology ;

- developing procedures for village participation in identifying claims and negotiation disputes and registering titles ; and,

- resolving legal issues to define and secure land tenure rights.

The long-term equity and viability of irrigated agriculture will depend, in part, on the resolution of these land tenure problems. It should also contribute to a more equitable distribution of land among village residents and will improve women's access to land. While the resolution of land tenure issues will solve one set of problems, it will contribute to the weakening of extended family ties and force a restructuring of social relationships. Establishing ownership rights at the household rather than extended family or lineage levels may also diminish the authority of traditional leaders.

2.4.2. New Systems of Agricultural Production

Throughout most of the valley, the technology of irrigated perimeters, the social organization of water management, and the intensive methods of agricultural production are complex innovations requiring technical and organizational skills not found in traditional dryland or flood recession cultivation.

A major, perhaps the major, cause of failure to develop productive irrigated perimeters can be explained by the inability of government planners and extension agents to adequately understand and deal with the technical and organizational changes required by irrigation. This includes the lack of technical packages adapted to local consumption needs and failure to adequately prepare and organize partipants to manage the water distribution system. There are also recurrent problems associated with soils, perimeter maintenance, production methods and financial management.

While the RDA's continue to give priority to new perimeter construction, the success of the program and the rapid expansion of irrigated agriculture depends on increasing the productivity on existing perimeters as well as increasing the number of hectares under irrigation. Perimeters must be constructed on soils with good agricultural potential. They should be designed to keep recurrent costs to a minimum and assure proper water distribution. They must be properly maintained and managed, and agricultural activities on them must meet not only the consumption needs of the farmer but also produce a significant marketable surplus. As long as irrigated agriculture results in low or mediocre yields, it will remain a marginal or supplementary activity.

The technical and educational interventions proposed by the project are designed to overcome past problems by improving the quality of construction and agricultural interventions and involving farmers more directly in planning management activities. There is an urgent need to solve the technical problems and to develop agricultural packages adapted to local food needs and labor supplies. The A.I.D. supported Agricultural Research Project (625-0957) will play an important role in assuring that this objective is reached. The ARP project will also improve the villagers'capacity to operate maintain, and manage irrigation systems. By allowing for increased farmer participation in decision-making and improving their technical and managerial knowledge and skill, the project will help villagers to develop adaptive strategies to integrate the technological and organizational changes to traditional agricultural and social patterns.

2.4.3 Social Organization of Perimeters

Results of previous research and evaluations have underscored the importance of factors of size and composition of productive units. Both high productivity and minimal disruption occurs when groups (groupements) are small (15-30 members) and relatively homogeneous with regard to ethnic and socioeconomic status.

The project will take these findings into account and assist villagers in organizing their own work groups using these criteria. Project generated research data will be especially useful in developing the social organization and management strategies on larger perimeters adjacent to Bakel and Podor, where populations are ethnically, socially, and economically more heterogenous.

The issue of social organization and perimeter management will become increasingly complex not only on these larger perimeters, but also in village perimeters, where irrigation will be expanded up to 50 or 100 hectares. While expansion will generate management problems, it will allow for increased village participation and will create opportunities for each social group (migrants' women, low caste laborers), to form and manage their own production units. In each case, the small production sections (groupements) will have representatives in a larger precooperative or cooperative responsible for managing technical and economic matters.

The project will limit the size of these functionally autonomous water using sections to include approximately six to eight groupements in order to maintain a high level of participation in decision making. The project staff will also explore alternative water allocation technologies that may reduce the amount and complexity of cooperative works. A more serious challenge to perimeter management will be in situations where a single water distribution system is shared by large numbers of cooperatives.

Organizational solutions to these situations will have to be developed on a case by case basis, taking into account the principle of representative participation. The project team suggests that the implementation schemes carefully examine, with members of village cooperatives, management strategies developed at large perimeters.

2.4.4 The Role of Women in Perimeter Activities

The first generation of village perimeters have tended to be undertaken by male heads of household. Many of the crops grown, however, were traditionally women's crops (rice, vegetables, and maize). In some areas, particularly in Soninké villages where many males are absent, women heads of household have been allowed to join cooperatives alongside men, or to organize their own groups or cooperatives. The recent tendancy towards smaller, more flexible production units has considerably facilitated women's participation.

In many places, because of their other roles and responsibilities, women participate in irrigation schemes in fewer numbers than men and want to grow different crops. The possibility of one or more women's groups alongside the more numerous men's groupements allow them to participate (as it does other minority groupements based on ethnic, caste, age). In other instances (mainly Peul and Tukulor villages), women have not been permitted to participate except as workers on men's plots. They continue watering their gardens by hand, while the men are given a pump. Since both are growing the same crops for the same market, this unfair distribution of subsidies will not be encouraged. Also, there is increasing interest in hiring women extension workers within RDA's to work with women, but no host-country women have yet been hired in such roles. RDA's and AID must be committed to include women whenever possible and not to exclude them when they ask to participate.

2.4.5. High Rainfall Villages, Djeri Villages, and Mixed Farming

The agricultural development strategy for the SRB has to date focused its attention and resources on the expansion of irrigation and has failed to adequately consider options and complementary activities. While the rapid introduction of irrigation systems is vital to middle valley communities, it is less crucial to the immediate and long-term development needs of villages in the upper valley where flood recession agriculture is less important or absent. The project will investigate the needs of these communities more fully and will implement actions to improve agricultural production. Specific activities to respond to immediate needs and agricultural potential include :

- animal traction ;
- the extension of dryland research results ;
- improved seed varieties and fertilizer supplies to increase the productivity of dryland agriculture ; and
- mixed farming strategies to take advantage of crop residues and animal manure. These strategies may also include the promotion of forage crops and improved animal health interventions.

2.4.6. Labor

Irrigated perimeters increase the pressure on the local supply of energy and human labor. Making project interventions more compatible with these constraints requires a fuller understanding of current patterns of labor usage and supply on a village by village basis.

One internal village problem related to the distribution of perimeter land is its impact on high caste families who depend on lower caste individuals to work their fields. As these lower status individuals cultivate their own plots, they have less time and need to work for others. However, one also finds lower status persons working perimeter plots owned by noble and casted families.

The project staff will present villagers with a range of technical and agronomic options, and will explain the implications of these alternatives in terms of time and resource allocation. This plan will enable villagers to guide the project in introducing innovations that take labor constraints into account. Labor saving interventions proposed by the project respond to villagers' for such devices as animal traction, and milling and hulling machines.

2.4.7. Leadership

By increasing opportunities on irrigated perimeters to the landpoor and women, the project will affect the basis of traditional leadership --control of land-- and create an opportunity for these groups to increase their power and influence. This has already

caused conflicts in a few villages but in most cases perimeter leadership is consistent with traditional village hierarchies. Typically, either the village chief, a member of this extended family, or other high status male serves as president of the pre-cooperative or cooperative. The effect of irrigated perimeter expansion on diffusion of authority to members of other castes and the social consequences of this event remain open to question.

2.5. STRATEGY FOR VILLAGE PARTICIPATION, EQUITY AND THE DISTRIBUTION OF BENEFITS

The most frequent criticism of the initial phase of perimeter development in the SRB has been that villagers were left out of the planning process and had little influence in the decisions regarding productive activities. While the problems have been most serious on the large scale, RDA managed perimeters participants in villages also strongly criticized the RDA's control over production, marketing and financial management. As internal and donor sponsored evaluations revealed these problems, the RDA's adjusted their policies and are now experimenting with alternative ways of increasing local participation. The IDP project can thus be viewed as assisting national efforts to decentralize development actions and to increase the participation and responsibility of the intended beneficiaries. The proposed project strategy will :

- involve villagers in site selection , perimeter design, construction, management and evaluation :
- improve access to perimeter land for landless residents and women ;
- assist the governments to identify and solve land tenure problems before committing resources to develop perimeters ; and,
- strengthen the role and capacity of villagers to obtain the benefits and share the risks of project operations.

The overall project strategy calls for a gradual approach which focuses on improved technical planning, more intensive training and field supervision, and increased farmer participation. It emphasizes the importance of adapting innovations to local ecological and socio-economic conditions, and outlines changes in planning and evaluation procedures to facilitate the periodic modification of project activities and organization.

This adaptive strategy for project implementation emerges from several important considerations. First, earlier production and productivity targets have not been met and were probably unrealistic to begin with. Part of the problem arose from the RDA's failure to adequately consider the social and cultural dimensions of technological innovation. Consequently, project plans did not include incentives and training sufficient to promote and sustain change at the farm, village and zone levels.

Secondly, while knowledge of general patterns is adequate for

regional planning , inter-village variations are significant and must be understood in order to assure the participation and support for continued expansion.

Finally, both the evolving macro and micro socioeconomic and political conditions will restructure opportunities and obstacles for development. Long-term success, therefore, requires a basic approach that assumes an evolutionary process and strengthens the capacity of individuals and institutions at all levels to respond appropriately. To accommodate this diversity, the type and level of local participation will vary with the specific nature of the activity and will increase progressively as villagers acquire the knowledge and skills that permit them to effectively assume greater responsibility. It is, in short, a strategy that recognizes that behavioral and motivational changes needed to achieve increased participation and production objectives require a reorientation of individuals and institutions, as well as the diffusion of new skills and technologies.

a) Participation in Decision-Making

Until recently farmers in the SRB have had little input into the decision-making processes that result in technical and management plans for irrigated perimeters. Government officials using technical and economic criteria imposed conditions and organizational arrangements --even to the extent of the type of crops to be planted. This approach has been criticized ; the OMVS Member States are searching for more effective participatory methods to achieve irrigation. This project is designed to promote and suppport village participation on two major levels of decision-making :

(1) Project planning, and modification of ongoing activities and ;

(2) Organization of local production units.

(1) Participation in project planning and modification of ongoing activities

This process has already begun as design team members have asked villagers to identify local problems and needs. Since many villages already have irrigated perimeters, their ideas often reflect desired changes in the existing programs. In areas where the project plans new intermediate and small perimeters - Podor, Kaédi and villages to the west of Gouraye - villagers will have an opportunity to participate in the initial perimeter design. In other areas, villagers will continue to suggest modifications of existing conditions and intervention strategies. While villagers have the right to refuse participation, the potential economic benefits and long-range environmental changes should provide a strong incentive for the introduction and expansion of irrigated perimeters.

During the construction of new irrigation works,villagers will participate in decisions regarding perimeter location and in the allocation of plots and specialized training. Similar decision-making authority in project villages with

existing perimeters will be encouraged, although freedom to determine their location will be restricted. Local residents will also participate in decisions regarding technical and agronomic options such as crop types, fruit trees and village woodlots, forage plots on perimeters, animal traction, and fish ponds. Such participation will require improving the preliminary promotion (sensibilization) effort to more fully inform villagers of the costs, risks and benefits of technical options.

2) The Organization and Local Production Units

Past experience on the irrigated perimeters and other rural development programs provides unequivocal support for the idea that farmer participation in decision-making is most effective in the context of villages associations. The project, through direct farmer training, mass communication, literacy training and improved technical assistance , will strengthen the capacity of existing perimeter management groups (pre-cooperatives and cooperatives) and other village associations to determine local needs, and to participate in planning and implementation. While a large part of the initial training will focus on irrigated perimeters, information and training for farmers associations will have a broader development perspective. Strengthening of farmer associations is the key activity in transforming a loosely coordinated program of technical, agronomic and economic interventions into a more closely integrated development strategy at the village level.

In view of the strong traditions of social hierarchy, economic inequality and the limited role of women in village level decision-making, the project will also develop and recommend specific procedures to ameliorate existing inequities and assure access to benefits. These recommendations will be generated by anthropological/economic analysis of village conditions and will deal with issues such as membership in production units, internal decision-making, conflict resolution procedures, leadership selection, and distribution of benefits. This strategy of social analysis and negotiation will precede the commitment of project resources to villages, and the agreements will be monitored and evaluated.

Since the social cleavages and organization of production in the valley are strongly rooted in cultural tradition, the project will develop a pragmatic approach to facilitate the gradual adaptation of existing village institutions to accomodate the proposed technical and social innovations. The ecological, sociocultural and economic diversity of the proposed sites poses both obstacles and opportunities for development that can be successfully dealt with only on a case by case basis. As the project evolves, results of research and evaluation will be analyzed to develop a series of model strategies that have proved successful under specific conditions.

b) Participation in Implementation and Management

The project calls for a higher level of local participation in implementation and management. Specific categories include :

(1) resource contributions (labor, local, materials, cash) ;
(2) management (administration and coordination) ;
(3) technical assistance (by villagers who receive special training) and ;
(4) recruitment of participants.

(1) Resource Contributions

Both the success and failures of previous efforts to promote the introduction of irrigation perimeters lie in RDA's high level of material support to villages. To assure rapid introduction and expansion of perimeters, the RDA's assumed all capital costs and heavily subsidized agricultural production inputs. While these economic incentives contributed to the rapid acceptance of irrigated agriculture, recurrent costs are excessive. A more efficient strategy based on a higher level of local contributions and a decrease in government expenditures is essential. Thus, one of the major challenges is to design and implement a strategy that minimizes official expenditures while increasing or at least maintaining benefits to the local population. It involves a reorientation of the existing incentive system to one based on the results of the farmers' own efforts. This objective will be difficult to achieve in areas where people are accustomed to, or aware of, previous government contributions such as tractor services, full perimeter construction. and subsidized fertilizer and seeds. In the long run, however, the economic viability of the project at the national level and its continued expansion along the river require a strategy based on increased local contributions and the participation of villagers in project implementation. Specific village resource contributions will include :

- labor and local materials during construction :
- all agricultural labor :
- water management and perimeter maintenance : and
- payment (in cash or crops) for agricultural inputs.

It will be the responsibility of the project and RDA staff to assure that the nature, amount, and timing of these contributions are understood and accepted by the villagers before the construction is begun. It will involve the sustained period of promotion and dialogue in which the AID technical staff as well as extension agents and social scientists will participate. The staff will work with OMVS and RDA monitoring/evaluation personnel to develop criteria and means of verifying that resource contributions are fairly distributed among potential beneficiaries within villages and perimeters.

(2) Participation in Implementation and Management
Villagers will be responsible for : cultivation, water distribution, maintenance of the canals and drainage system, and marketing. They will participate in management and financial activities through small water-user units and as members of pre-cooperatives or cooperatives . These associations will be responsible, collectively, for allocating tasks, defining problems, and resolving conflicts They will be required to establish a savings mechanism (Caisse d'Amortissement) to be used for repairs and eventual pump replacement.

The organizational arrangements required for successful project implementation on the present small perimeters have been fairly well established, but a wide range of recurrent technical and organizational problems remain. For this reason we propose that the first stage of implementation focus on strengthening existing organizations and improving the productivity of existing units before beginning new or expanding old perimeters.

As small perimeters expand and the new larger perimeters in Bakel and Podor are developed, the issue of organizing local participation is more complex. While the objective will be to maintain the integrity and responsibiliy of small production and water management units, farmers will be faced with technical and organizational requirements of a different magnitude. Although some situations will require immediate, and occasionally prolonged expert technical assistance (e.g. water management experts, pump maintenance and repair specialists for large units, cooperative specialists), the project staff will give priority to preparing villagers, and/or those they select, to fill these roles.

(3) Village Participation in Providing Technical Assistance
Farmers are presently advised by technical agents of the RDA's who assist in perimeter construction, pump repair and introduction of agricultural techniques appropriate to irrigated perimeters. The project proposes a redefinition of the role of these technicians and extension agents and, whenever possible, their gradual replacement by villagers. The proposed strategy thus involves more direct farmer technical training (in villages and regional centers) and the recycling of existing agents to function as trainers and higher level technical assistants. This will increase farmers participation in all aspects of perimeter management and production and will place responsibility for diffusion of information on individuals directly accountable to the beneficiaries. Procedures for remuneration and other forms of compensation will be worked out among village associations and the individuals who are trained to provide the services. Strategies currently used for compensation of pump operators range from cash payments, to labor on their fields, to allotments

of a small percentage of the harvest. The project staff will raise these issues and inform villagers of arrangements successfully used elsewhere. The final decision on compensation will be negotiated at the village level. To avoid potential problems, we recommend that several villagers be trained in each technical skill and new candidates be sent to training sessions if those previously sent fail to perform satisfactorily.

The role of the RDA's and project staff will be to provide high quality training and field supervision. In addition, they will develop training modules for both village-level technical and cooperative management personnel to allow them to periodically upgrade their skills. Training activities to be given immediate priority include : water management, perimeter maintenance, financial administration, and agricultural extension.

(4) Village Participation in the Recruitment of Beneficiaries
This is perhaps the most overlooked aspect of participation and one which, within the hierarchical sociocultural context of the SRB, requires an approach based on careful anthropological analysis. The issue of village participation in the selection of beneficiaries requires a delicate balance of two principles of the project strategy :

(i) Accomodating proposed interventions into the existing sociocultural context and ;

(ii) Assuring benefit distribution to a maximum number of residents.

Too much emphasis on the former decreases the possibility that the second objective will be met ; too much emphasis on the latter may generate opposition and social conflict. To resolve this dilemma we propose the following strategy :

(i) Preliminary socioeconomic analysis to identify social groups, their relationship to productive resources (e.g. land, labor, animals), and patterns of leadership within each group.

(ii) Diffusion of information on project purposes and activities to all potential beneficiaries before villagers make a final selection of participants. This requires extensive discussions with village authorities and a series of small and large meetings with groups of various types.

(iii) The outcome of these discussions should be a framework for selecting beneficiaries which takes into account the needs and desires of the different groups. The objective, especially when dealing with villages starting their first perimeter, is to introduce the principle of equity and wider benefit distribution. As perimeters and other innovations produce positive results

and generate demands for expansion, it will be easier for the project staff to insist on a more equitable formula for village selection of beneficiaries.

c) Participation in Benefits

Several types of material, social and personal benefits will accrue to individuals and villages participating in project activities.

(1) Material Benefits

The most important material benefit is access to water needed to grow food and to provide security from the periodic droughts which occur in the region. Other benefits include : increased food supplies and income, a greater diversity of agricultural products, tools, and, in some areas, animal traction equipment. Many villagers will derive secondary benefits through the investment of increased revenues in other activities.

Statistical information on the number of potential beneficiaries are presented in the tables which summarize population data for each zone (section 2.2.1.-2.2.3. and in section 2.8, Social and Institutional Analysis: Project Zone level). Figures on the number of farmers to receive special training the number of direct beneficiaries are included in the training section of the project paper.

(2) Social Benefits

While the immediate benefits from irrigated perimeters will accrue to a small percentage of the local population, the project plans to increase participation to the maximum number of villagers and residents possible. This expansion should provide the inhabitants in each project zone with access to water and the skills and technology needed to assure food security under difficult climactic conditions.

While the introduction of irrigated agriculture can be viewed as a technical option or addition under present conditions, its effective and **rapid** expansion is vital to the long-term economic and social security of villagers once the dams are completed and the annual flooding of fields reduced and eventually eliminated.

Other direct social benefits include roads, access to agricultural information and inputs, and improved health monitoring services. Additional community benefits that will occur either through direct project investments or local initiative are increased transportation facilities (animal-drawn carts, jeeps and trucks), increased storage facilities, and equipment to transform agricultural products for consumption and marketing (e.g. milling and hulling machines).

(3) Non-Material Benefits

Successful project implementation will promote psychological and attitudinal changes and facilitate the reorganization and expansion of irrigated agriculture programs. Both some past and current RDA policies were imposed on farmers who had little or no input into either planning or key operational decisions. The lack of dialogue and frequent technical problems contributed to farmers' sense of distrust, anger, and loss of control over events affecting them. The proposed strategy develops the farmers' capacity to acquire competency in the use of new technology and managements of labor and production. By providing farmers and village associations with the skills needed for effective local control, it restructures their relationship to official agencies towards one of cooperation and shared responsibility.

The project also opens new opportunities for leadership through village associations and provides substantial training in technical and administrative skills which individuals may use to improve both income and status.

d) Village Participation in Project Evaluation[1]

Local contributions to evaluation activities include :

(1) Provision of information ;
(2) Assistance in data collection ;
(3) Diffusion of preliminary results and recommendations ;
(4) Response to results of preliminary findings ; and,
(5) Monitoring the implementation and effectiveness of recommendations.

To implement this policy of systematic village participation in evaluation, the project will : increase the number of monitoring/evaluation personnel ; recruit African scientists with graduate training to work in research and evaluation ; and establish permanent field units in project sites. This field staff will be supervised and trained by an experienced Senior Level Applied Anthropologist and other members of the OMVS Project Management Unit. The project will also encourage evaluation units of RDA's to adapt a similar strategy of increasing trained social science personnel and establish a permanent role for them as part of project field operations.

Involving villages in evaluation requires a slow process of continual contact with various categories of village leaders and groups. The staff will have to explain the importance of monitoring and evaluation in terms of key decisions which

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1. This section discusses the participation of the local population in the evaluation process. The much broader issue of evaluating community participation will be dealt with in detail in the section describing the monitoring and evaluation strategy.

affect project operations within villages and at higher levels. Villagers, in short, will be told what information is to be collected, why the information is needed, and how it will be collected and shared with them. This will allow villagers to participate in the formation of evaluation procedures and to suggest modifications.

Several procedures will be instituted to assure that evaluation results are integrated into field and staff operations and that they will be useful in the decision-making process. The first is to decentralize preliminary data analysis to the site level. The second is to institute a series of formal discussions of results and recommendations among local project staff and to invite higher level RDA staff to attend.

The third is to provide village leaders and associations with summaries of the findings and recommendations, and to ask them to discuss the results within their own groups.

Next, representatives of the RDA, OMVS, and AID project staff will organize and participate in meetings with village groups to discuss their opinions regarding project activities and recommended changes.

Finally, villagers will be asked to share responsibility for implementing recommendations and to monitor both local and staff compliance with them.

e) The Participation of Women in Village Development Activities

Women in the SRB participate in food production activities in both traditional and irrigated agriculture. Since short and long-term male migration is common in the region, the increased labor needs required in irrigated perimeters has a direct impact on women's time and energy. Women do, however, participate in the benefits of a more diverse and secure food supply and profits from marketed surplus. In some villages women garden within or adjacent to irrigated plots.

The project strategy is designed to facilitate and increase women's participation in village development activities, including the operation of irrigated perimeters. It also, however, recognizes the need for a gradual approach, sensitive to and consistent with, the sociocultural context of village affairs. The general strategy recommended for increasing women's participation includes the following objectives :

(1) Assure women's access to at least a minimum number of parcels in new perimeters ;

(2) Assure that women who are de facto heads of household have the same rights on perimeters as men ;

(3) Increase women's access and rights to irrigated plots as perimeters expand [2] ;

2. The long range objective is to change the rules to allow women full and equal access to perimeter land and decision-making groups.

(4) Determine and introduce ways of increasing women's participation in perimeter groups and associations ; and

(5) Strengthen their productivity and access to benefits resulting from increased production.

In short, the proposed strategy views specific actions to improve conditions for women as necessary to meet their immediate needs, and as a preliminary step towards assisting them to improve their participation in development decision at the village, regional and national levels.

While some of the activities of the female staff will be directed towards women and women's groups, they will participate in other project operations such as agricultural extension, cooperative training and evaluation. They will work with the staff to improve the sensitivity and responsiveness of all project activities to women's needs provided by the project and other agencies.

Specific project activities that will directly benefit women include .

(1) Direct access to agricultural inputs and extension education ;

(2) Credit ;

(3) The introduction of labor-saving and profit-making technology such as milling and hulling machines ;

(4) Fish ponds and village woodlots ;

(5) Literacy training ;

(6) Increased access to water ;

(7) Improved health services : and

(8) Improved transportation and marketing opportunities.

The project will try also to develop ways to transform and improve marketing opportunities for milk products and vegetables from women's gardens. The project staff will assist women's groups to obtain official legal status insofar as this is necessary to obtain credit and other resources.

2.6. ORGANIZATION AND PHASING OF ZONE-LEVEL PROJECT ACTIVITIES

2.6.1. Avoiding Past Errors

Those who have studied and participated in irrigated agriculture projects agree that many problems can be traced to shortcomings in the technical design and the overall approach to planning and construction. A number of these problems are considered in detail in other sectors of the project paper and are summarized below. The primary concern of this section is to detail specific implementation procedures to avoid past errors and maximize the opportunities for high quality technical work and informed village participation. Recurrent problems seen in SRB sites and common to irrigated agricultural schemes in other areas include:

Technical
-site selection (poor soils and topographical characteristics);
-faulty technical design;
-faulty perimeter engineering;
-logistical problems in supply of agricultural inputs and pump repair experts;
-imposition of cropping schemes, price and marketing structures.

Sociocultural
-lack of consultation with and participation of villagers in site selection and operations;
-failure to adequately investigate and deal with land tenure and compensation issues;
-failure to consider social aspects (e.g. composition of farmer associations, the supply and division of labor, leadership patterns);
-agricultural packages not adapted to local food habits and needs;
-inadequate and poorly managed extension-education activities (agricultural production, operations and maintenance of water distribution system);
-failure to adequately train and support farmer associations with site level operations;
-inadequate monitoring and evaluation of extension-education activities and impact on the target population.

While it is tempting to separate technical problems from management and/or social issues, such distinctions are often misleading and may impede efforts to understand and solve specific problems. For example a poor designed or poorly constructed perimeter can increase costs and limit productive potential and may lead to social conflicts and village dissatisfaction with irrigation schemes. Similarly, failure to consider sociological factors such as the ethnic composition of producer groups can lead to social conflicts which may result in the failure of the group to effectively operate and maintain irrigation works. The reasons for past and current problems are complex and interrelated. Their resolution requires a closely coordinated effort among technical staff, extension-education personnel and the sociologist.

2.6.2. Implementation Phases

The following section outlines a general strategy for phasing in project activities at the zone level. In addition to acknowledging problems identified in the past, the strategy assumes that the rapid pace of change in the SRB and the nature of an innovative, integrated program require an adaptive approach which considers new conditions and emerging opportunities. A few of the more dynamic aspects of socio-economic conditions in the SRB are listed below.

-Member States and the RDA's have reconsidered earlier development plans and committed themselves to decentralized management, increased farmer responsibility and reduced RDA control over marketing and the supply of agricultural inputs. Although it is not possible to estimate what progress the RDA's will make in the implementation of this revised approach, the field team must carefully evaluate programs in each zone before beginning major construction and training activities.

-Member States are currently evaluating national-level economic and development policies. Changes in these policies within the next few years will affect local conditions.

-New technologies for irrigated agriculture and other farm activities are being rapidly developed and the project team will need time to examine and evaluate these options.

The phasing-in-strategy also addresses spatial and temporal issues in project implementation. Micro-level research activities will collect site-specific data and with subsequent analysis will permit the necessary adaptive adjustments. The schedule itself affords sufficient time for project team members to develop strong working relationships with local officials and farmers, thus facilitating their participation in local-level planning.

The zone level implementation plan organizes a series of activities into the following phases:

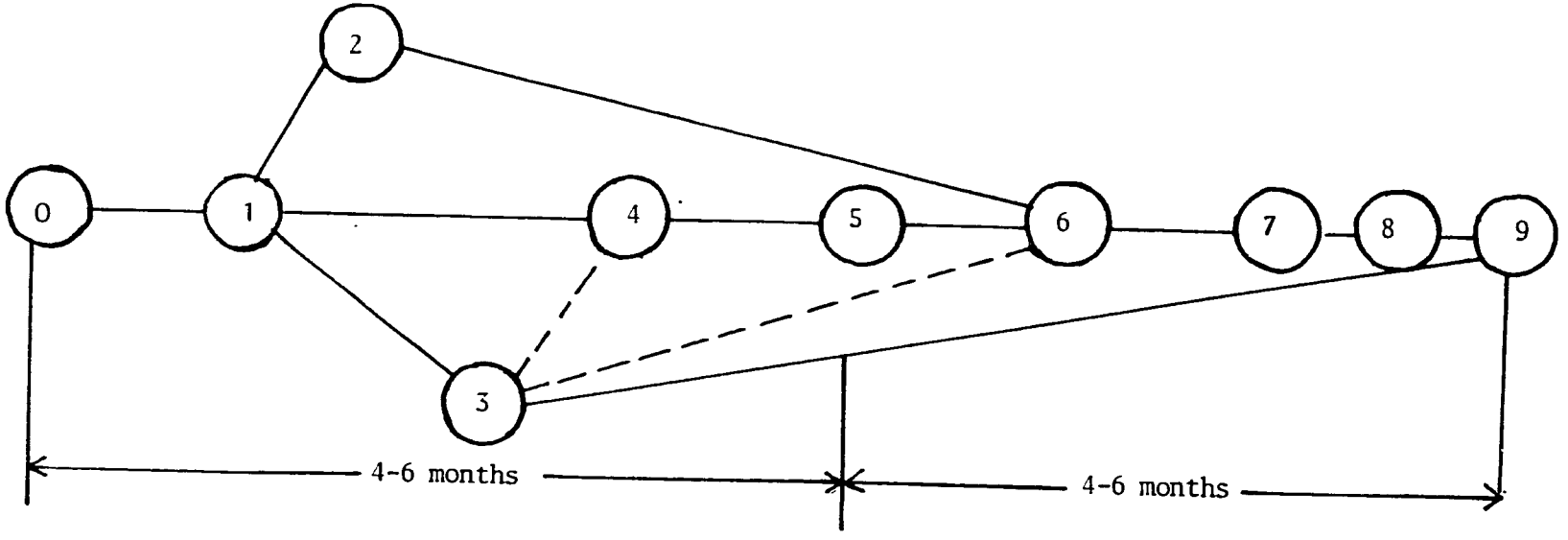
- Phase I : Organization and Planning (year 1);
- Phase II : Implementation and Mid-Project Evaluation (years 2, 3, 4);
- Phase III : Implementation and Final Evaluation (years 5, 6, 7).

2.6.2.1. Phase I: Organization and Planning (year 1).

The implementation team will need approximately one year from time of arrival for orientation to the program and field conditions, and to prepare a specific action plan for project implementation. This "start-up" period will give the field staff adequate time to prepare for the large scale committment of human and material resources which begins in the second year. Key events in this first phase are:

1) Orientation and planning seminars in Dakar and St-Louis;
2) Organization of home and work setting;
3) Recruitment and training of host country staff;
4) Assessment of the local development context;
5) Establishment of a project zone management system;
6) Preparation of a short-term action plan;

YEAR 1: PROJECT IMPLEMENTATION PLAN AT ZONE LEVEL



0. Arrival of Project Staff
1. Orientation/Training seminars
2. Organization of home and work settings
3. Recruitment and training of local staff
4. Assessment of the local development context
5. Establishment of a project management system
6. Preparation of a short-term action plan
7. Implementation of short-term field activities
8. Preparation of a zone development plan
9. Complete preparation for phase II implementation

7) Implementation of a small-scale interventions and pilot research activities;
8) End of year evaluation and redesign of development program.

These activities will be implemented by the project staff in each zone in close cooperation with the RDA's, the OMVS, the River Basin Development Office and Local populations. Details of these activities are presented below.

1) Organizational and Planning Seminars
These will be conducted by the AID River Basin development Office and the appropriate professional staff within OMVS (primarily those in the Evaluation and Planning Unit, and the Study Division). They will be used to orient staff to the SRB and the history of development programs in the region. The participants will review and discuss the literature dealing with ecological, political, agronomic, social and economic conditions. They will critically analyze the project paper and will be informed of economic, legal and policy changes that have occured since June 1982. They will discuss the implications of these changes for program objectives and strategies. The seminars will cover the organization of development institutions in the SRB and establish a framework for coordination among the Field Units, the RDA's, OMVS and the RBDO. They will deal with the existing management information system, procedures used to order supplies and equipment, and to hire local personnel. The seminars will also develop implementation guidelines for the full range of activities planned for the first year.

2) Organization of home and work settings
The field staff will need time to locate and/or renovate buildings for living quarters and offices. They will assess their needs and obtain supplies, furniture and equipment.

3) Recruitment and Training of Host Country Staff

a) Professional Staff (technical experts, social scientists, W.I.D. specialists). Identification, recruitment and training of these individuals will be a cooperative effort involving personnel from the RBDO, the OMVS and RDA's.

b) Local Support and Staff. Recruitment and training of research assistants, secretaries, drivers, and other local staff will be done by the project team in each zone.

4) Assessment of the Local Development Context
The initial orientation and planning seminars will focus on developments at regional and national levels. Responsibility

for assessing conditions and changes in the project zone will be shared among members of each implementation team. This field assessment has two key objectives :

- understanding the ecological, sociocultural, economic and institutional contexts, and ;

- developing an effective cooperative working relationship between members of the project staff and those with whom they will be working - development officials, political and religious authorities, local businessmen and farmers.

What must be avoided is a repetition of the approach , initially used by all the RDAs during the 1970's, which imposed a rigid organization and mode of operation without consultation or concern for local needs and conditions. The first step in implementation of the proposed adaptive strategy is, therefore, a period of mutual learning in which the project staff draws on the experience and knowledge of individuals in the area, and shares with them information on the program. Some of the specific topics to be covered during this field assessment are listed below.

a) Political /administrative system : The scope of authority and role of government administrators should be examined. The local officials need to be informed of project goals and activities, and staff should understand how the political/administrative system may constrain or facilitate operations. Local authorities often play an important role in conflict resolution (e.g. land disputes between villages) and may be important in deciding how some development resources are allocated to villages.

b) Current organization and staffing of development institutions operating in the area. This should not be limited to the RDA, but should include agencies for livestock development, public works, health and education.

c) Impact of macroeconomic conditions and policies on local activities and programs. This will cover the pricing policies, subsidies, changes in administrative organization, land tenure and farmer associations.

d) Development History in the Project Zone. What have been the major programs, how were they operated and what has been their impact. Particular attention will be given to the evolution of RDA activities.

e) Ecological-Social-Economic Environment. While some of this will be available in the literature, the project staff should visit villages and discuss social patterns, migration, economic conditions, marketing systems and non-farm employment with officials and farmers. The team should elicit local views on how these conditions affect development needs and opportunities.

f) Farming Systems. All members of the staff should review the literature and make field visits to observe the different types of agricultural and pastoral activities.

In addressing the various topics during this preliminary assessment the field staff should focus on :

- identification of information gaps that need to be filled in both the short and long term.

- development of an approach to the collection of additional data.

- understanding the perspectives which characterize different social, cultural and economic groups.

The last point is a crucial one for project implementation. Too often those involved in project planning and implementation fail to adequately understand or take into account the variety of views of different actors in a situation. This goes beyond the obvious division between government officials and farmers. There is substantial variation within each category -- for example, between headquarters staff and field agents, or between large landholders and casted groups. While the task of examining these sociocultural issues is primarily the responsibility of the social scientist, it is important for the whole team to develop a sensitivity to the various positions people have regarding past and current activities.

5) Establishment of a Project Management System
The project team will use established management-reporting procedures to meet the requirements of USAID and the RDA's and the project paper outlines ways in which the team will function within the RDA administrative structure. There are, however, a large number of options regarding the internal organization of the project team, their relationship to local RDA staff and other institutions which should be addressed after an assessment of the local situation. They include the clarification of authority guidelines for decision-making, a modification of scopes of work for each team member and, a clarification of operating procedures to coordinate project activities within the organizational context of the RDA.

A preliminary internal project management information system must also cover issues such as :

- administrative and financial procedures ;
- use of vehicles and other equipment ;
- development of work plans ;
- meeting schedules ;
- report forms.

6) Preparation of a Short-Term Action Plan
After establishing themselves in the zone and assessing local conditions, the team will develop a plan of action as a first step towards accomplishing project objectives. The issues they will deal with include :

a) preliminary site profiles based on RDA and OMVS reports supplemented by reconnaissance surveys ;

b) additional needs for information and resources to begin small scale interventions ;

c) the initiation of baseline studies linked to OMVS research activities ;

d) the design and implementation of a project monitoring and evaluation system.

The depth and scope of these activities during the first year will depend on resources and time available, and the speed with which administrative and logistical problems are solved. One can predict delays in the arrival of equipment and personnel as well as other obstacles which slow down implementation. Another factor is the time of the agricultural calendar when the team is ready to seriously begin field activities. Rehabilitation and construction of perimeters, for example, require many months of advance preparation and must begin within a few months after the rains end. Also, some surveys are best carried out when farmers are engaged in specific agricultural activities which occur during a one or two month period.

7) Implementation of short-term field activities
Based on needs, resources available and the point in the agricultural cycle, the team will begin survey and research work and, participate in construction and/or extension education activities.

8) Preparation of a Zone Development Program
Eight to twelve months after arrival, team members should have the knowledge and experience necessary to critically assess the objectives, strategies and assumptions presented in the project paper. They should, in cooperation with other development officials, evaluate the existing plan and make whatever modifications they believe are necessary. The output of this activity should be a detailed implementation plan with quantitative and qualitative objectives and indicators, as well as a description of how these are to be measured. The plan should also contain network plans for major events and activities.

While the plan will address end of project (year 7) objectives it should also detail mid-project objectives. This will facilitate the process of conducting a large scale mid-project evaluation in year four.

The revised project plan will be submitted to authorities in the appropriate agencies for modification and approval. The approved, revised implementation plan will be the basis for Phase II activities.

9) Complete preparation for Phase II implementation
This includes the ordering of supplies and development resources, and the recruitment and training of additional staff.

2.6.2.2. PHASE II : Implementation and Mid-Project Evaluation (Years 2, 3, 4).

During the second year of the project each zone team will concentrate on implementation of the revised project plan. Activities in this phase include :

- perimeter rehabilitation and construction ;

- an animal traction program ;
- extension-education and surveillance of field agents ;
- completion of short term research and policy studies on specific groups (pastoralists, women, fishermen, etc) ;
- the first phase of long-term studies ;
- the establishment of a coordinated monitoring and evaluation program ;
- the completion of detailed feasibility studies for sites identified in the project paper ;
- a rural credit system ;
- effective coordination or regional (OMVS) agricultural and socio-economic research with zone level training and extension activities.

The implementation of these activities will permit the improvement and extension of existing irrigation systems and the initiation of new projects to increase agricultural production. The major challenge is to develop an effective program consistant with the policy and organizational reforms recently established by the OMVS member states.

Those which will demand continuous attention include objectives to increase the scope and quality of farmer participation and the involvement of the private sector. Development of the specific mechanisms and the marshalling of resources necessary to put them into practice will be difficult and require extended periods of trial and error. They involve structural and organizational changes, and a reorientation of perspectives and behavioral patterns which can only be modified through extensive training and experience. It is difficult and often counterproductive to establish fixed timetables for such objectives.

The other dimension of the project -- the introduction of new skills and technologies -- also requires a cautious, flexible approach. While fishponds, animal traction, fruit trees and other project components are not unknown in the SRB, their integration into the irrigated perimeter schemes on even a modest scale involves a high level of uncertainty. These innovations will be introduced during this phase and the results carefully monitored and evaluated. The goal will be to learn enough about them, including implementation requirements and farmer response, to guide their expansion during the final phase of the project (years 5-7).

At the end of years two and three, internal project evaluations will be held at the zone level. These will be conducted primarily by the AID, OMVS and RDA staffs, but should also include some representatives of private institutions and farmer groups.

During the fourth year there will be a comprehensive mid-project evaluation for each zone and the regional program. This evaluation will consider the effectiveness of project operations as well as impact on the target populations. The results of the evaluations will be used to plan the final phase of project activities. RDAs, other donors, A.I.D. and OMVS

personnel will participate in both the execution of the evaluation and in the planning of the next phase.

2.6.2.3. Phase III : Implementation and final evaluation

Activities during this phase will reflect plans based on the mid-project evaluation. Such activities include the completion of all construction programs and feasibility and research studies, a master plan for development of the Upper Valley, and a coordinated basin-wide monitoring and evaluation system. A major concern will be to consolidate organizational changes within public and private institutions, and to have individuals sufficiently trained to continue the pace of development. This should result in a substantially reduced role for the RDA's and a corresponding increase in the capacity of other groups including suppliers and farmer associations, to assume responsibility for planning and implementing development efforts.

The final activity is an evaluation of the project, and recommendations for the next stage of development within the zone. The project zone staff will also contribute to recommendations for a master plan to guide future research and integrated development activities in the SRB.

2.6.3. Village Profiles, Site Selection and Construction : An Integrated Approach

2.6.3.1. Village Profiles

While much of the project focuses on the construction of new irrigated perimeters and the introduction of technical and economic innovations, the staff will also be involved in the full range of activities to support and improve existing perimeters in the project zone. These include the extension-education programs detailed in the training section of this project paper, small scale improvements in irrigation works, supervision of extension work at the farm level and technical assistance to farmers associations. In short, the team members are multipurpose technical advisors involved in the full range of zone level activities. In practical terms it means that the staff members will need to quickly familiarize themselves with specific village conditions in addition to planning the activities required for major perimeter rehabilitation and construction.

To meet this goal, the team will need to assess conditions in each village and develop site profiles (1). These site profiles will orient the staff to present technical, -social and economic conditions in each village and the history of development activities. Planning and data collection done by the local project and RDA staff, will include extensive discussions with farmers. It is important that this be a mutual effort so that the technicians can benefit from the insights of the social scientist, and the latter develop a more precise understanding of engineering and agronomic issues.

Developing these profiles will involve a review of existing data from each site (such as OMVS's Fiches Signalétiques, Bilan de Campagne and Annual Zone RDA Reports) and village reconnaissance surveys. Staff members will review production and debt repayment records, examine the physical works and discuss issues such as those cited in previous sections dealing with "past errors". The primary objective is to determine what has occured at each site, reasons underlying problems and successes, and to identify current difficulties that can be dealt with without a major committment of resources. The information will also be useful for identifying problems and issues that require longer range solutions and a higher level of process. The results of these activities will be used to develop action plans for all the villages in the project zone. The planning and survey activities should be integrated into the first year program for the Mobile Training Unit.

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(1) Information contained in these profiles should be standardized for all project sites and may be viewed as a part of the baseline data to be incorporated into the project information system.

2.6.3.2. Site Selection and Construction: An Integrated Approach

The rehabilitation and construction of irrigated perimeters is one of the principal project activities. This section outlines a detailed approach to site selection, perimeter planning, village participation, training and construction. It presents a model for the integration of engineering, agronomic and social aspects of perimeter development, and highlights key decision points in the planning and implementation process (flagged "Critical Point"). The chart on the following page presents a network plan of the principal events and a brief statement describing them. This is followed by a description of what is involved at each step with special reference to those which involve critical decisions that can affect the flow of future activities.

STAGE I. Feasibility and site selection

The project paper contains a list of sites recommended for rehabilitation and expansion. Most of these have been visited by one or more team members and all available technical and socioeconomic information on them has been reviewed. While conditions will change, the existing list of villages can be viewed as the starting point for operations and the staff can assume that the interest and potential for perimeter development is there, although this too will be verified during preliminary field visits. Once the team is assured that the village is interested in a major rehabilitation or construction effort, the following steps should be taken.

0. Advise the village of the team visit

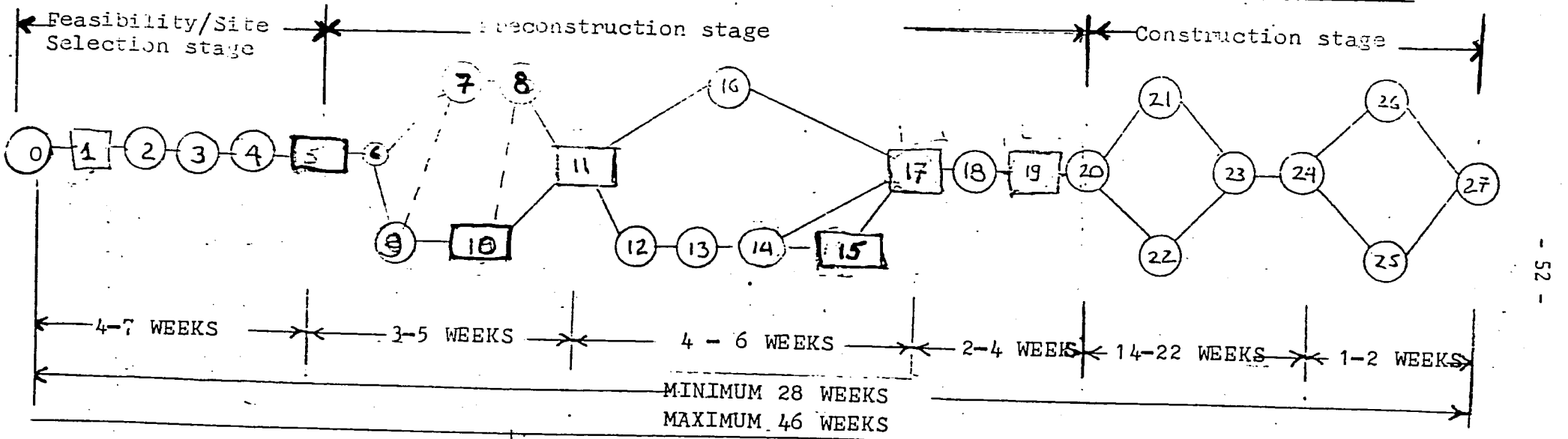
This involves contacting the village authorities and members of the perimeter association (if one exists) and asking them to inform others in the village of the planned orientation meeting. Village extension agents and the project social scientist can assist in assuring that village leaders representing the various social groups are properly informed. The date, time and place of the meeting should be worked out in advance with village authorities.

1. Orientation meeting. Critical point

This meeting has several objectives :

- To inform villagers of the opportunity for rehabilitating or constructing an irrigated perimeter..
- To explain the steps involved in site selection, training and construction.
- To present and discuss responsibilities for planning, construction and management.
- To determine if the villagers are interested in participating in the project. This is a CRITICAL POINT. If , after the discussion, the villagers decide not to procede, the process stops here. This meeting takes place in the village and will be conducted by members of the animation

NETWORK PLAN : ANIMATION AND SITE SELECTION THROUGH PERIMETER CONSTRUCTION (20 - 30 Hectares)



0. Advise village of visit.
1. Orientation meeting.
2. Socio-economic background survey.
3. Socio-economic field survey.
4. Perimeter visits.
5. Identification of construction sites
6. Final site selection.
7. Topographic survey.
8. Draft perimeter plan completed.
9. Labor, land tenure survey.
10. Resolution of land issues.

Critical decision events

Other events.

11. Village approval of plan.
12. Participation/Planning meeting.
13. List of participants completed.
14. Verification of participant list.
15. Resolution of participation/equity issues (if necessary).
16. RDA approves engineering plan.
17. Organizational meeting : village association.
18. Associations formed, village technical trainees selected.
19. RDA-village contract signed.

20. Construction begins ; Agricultural input ordered.
21. Village technicians/managers trained.
22. Major canal network completed, pump installe
23. Water management and irrigated agriculture training.
24. Construction completed.
25. Canal maintenance system established.
26. Agricultural inputs in place.
27. Perimeter ready for planting.

team including : at least one member of the technical supervisory staff, the extension-education specialist, the social scientist, and the village extension agent (encadreur).

2. Socioeconomic Background Survey
Review and analysis of existing socioeconomic data on the village and existing perimeters. This includes research and evaluation reports, census data, reports of government agencies, analysis of production and debt repayment. Key documents include :

- Fiche signalétique (OMVS).
- Bilan de Campagne (OMVS).
- Annual Report from Zone (RDA).
- Evaluation Reports by RDA's, OMVS and Donor Agencies.
- Special research studies (OMVS documentation Center, St. Louis).
- National and local administrative Census data.
- ORSTOM (Lericollais) and other maps.

This data will be summarized and analyzed so that follow up field surveys can explain past results and fill in information gaps. The zone social scientist has the primary responsibility for this and will be assisted by other project social scientists in Dakar, St. Louis and/or Nouakchott.

3. Socioeconomic Field Survey
Following the literature review, the social scientist will conduct a qualitative socioeconomic survey of the village. He and other social scientists will develop a field check list to facilitate the investigation and members of the animation team will assist in fieldwork. They will concentrate on gathering data related to the identification and enumeration of :

- Social groups, formal and informal associations, and patterns of social stratification.
- Groups and lineages that control land and other productive resources.
- Leadership and decision-making groups and patterns.
- Political and religious authorities.
- Land tenure and land use patterns.
- Spatial organization of the village (map of village).
- Initial individuals interested in participating in the project.
- Migration patterns.

- Agricultural labor supply in the village and other sources of labor.

- History of development projects in the village (including perimeters) and current projects.

- Village needs and attitudes towards irrigated agriculture.

- Assessment of the socioeconomic impact of existing perimeters.

The results of the background and field surveys will be written up in a site report and discussed with the team making the technical field visit (step 4). Leaders of all relevant social groups in the village such as landowners, casted groups, landless women, perimeter associations, and youth will be informed of the technical team visit and asked to participate.

4. Perimeter planning visit

This visit is concerned with providing villagers with details on the stages of project planning and implementation, and explaining guidelines for participation and the selection of technical options.

The technical and animation team will go to an existing village or nearby perimeter with representatives of village groups and potential participants. The technical and extension staff will present information and discuss issues of :

- Site selection based on soils and topographical features.

- Resolution of land tenure issues, mapping and registration of parcels.

- An overview of the stages of construction.

- Technical options (agronomic packages, fishponds, fruit trees, animal traction,etc).

- Roles and responsibilities of the RDA and villagers before, during and after construction.

- Guidelines for assuring equitable access to benefits and villager participation in decision-making.

- General information on perimeter management including the fund for pump replacement (caisse d'amortissement) financial management, and organization of water users associations.

At the end of the meeting the animation team will ask the

villagers to discuss the project among themselves for a few weeks and decide if they are interested in continuing. The team will also ask them to make a preliminary identification of sites they would like developed with reference to site selection guidelines explained during the meeting. During this period villagers may have additional meetings with project staff to clarify technical and/or organizational issues.

5. Decision period : to continue or not to continue with project. Identification of construction sites. (CRITICAL POINT)

If villagers, after discussing the overall strategy and requirements, decide not to proceed, they will inform the project staff. If they decide to continue, then the technical and animation team will visit the village to survey sites suggested by the participants and identify the relative advantages and disadvantages of each. They may also recommend alternative locations.

As most preliminary surveys of potential sites have already been conducted by RDAs, other donors and/or members of the design team, a decision regarding site location during this visit should be possible. If not, a second visit (step 6) will be scheduled. The outcome of the meeting (step 5 or 6) will be the identification of the general area for perimeter construction and the decision to procede with the topographic and socioeconomic surveys.

6. Final Site Selection (If necessary).
Identification of general boundaries and decision to procede with topographical and socioeconomic surveys will be made.

STAGE II. Preconstruction Stage

7. Topographic Survey Completed.
Engineers will conduct a topographic survey and soil analysis of the site. The study should also identify those individuals claiming rights to the land and precise boundaries noted. Conflicting claims will also be recorded.

8. Draft Perimeter Plan completed.
This is a preliminary plan to be submitted to villagers for their approval before being sent on to RDA headquarters for approval.

9. Socioeconomic Study on Land Tenure, Land use and Labor.[1]
This is a focused study by the social scientist on who owns the land scheduled for development, how it is used and the labor force which uses it. He will identify any outstanding land tenure and socioeconomic issues.

(1). Additional details are presented in the report by the land tenure specialist.

10. Resolution of Land issues. (CRITICAL POINT)
The sociologist, village leaders and land owners will discuss and resolve key remaining problems. Final boundaries indicating existing claims to land will be determined and these holdings registered on the site survey prepared by the engineers. How owners will be compensated will be determined (e.g. additional parcels, first choice of parcels).

11. Village Approval of Draft Engineering Plan
Villagers will review the draft plan. The project team will indicate how parcels will be divided (map outlining number or parcels and their location) but villagers will be allowed to modify layout of the system. Villagers approve plan.

12. Participation/Planning Meeting
This meeting will follow immediately after step 11, possibly on the same day the plan is approved. The villagers will now know the number of parcels which can be developed, and will now have to select the final list of beneficiaries. During the meeting the animation team will again present participation selection guidelines which stress landless farmers and women. The project staff must also draw up equity guidelines based on information collected in the socioeconomic survey. Among the principles to consider are :

- The first perimeters should allow all those who wish to participate access to at least one parcel (taking minimum size requirements into account). In cases of large village populations, access rights to even the second or third perimeters may be restricted to farmers without parcels, the remainder being allocated to individuals who already have irrigated land.

- Once all those wishing to participate have access to at least one parcel, then other factors such as number of agricultural workers in a family, the productivity of the existing parcels and their technical capacity to cultivate additional lands (e.g. use of animal traction) should be taken into account.

- Once the first perimeter is established and functioning satisfactorily, the team will be in a stronger position to develop more precise guidelines for equitable distribution among all social groups. This is a delicate issue and the staff must be sensitive to wishes of traditional authorities while at the same time trying to increase opportunities for those with less wealth and power. While the final decision must be left to the villagers, the animation team and the social scientist may wish to participate in the discussions.

13. Villagers complete list of participants
In most villages, the number of individuals desiring access to irrigated land will be greater than the number of parcels to be developed. Programs in the past that attempted to respond to all requests for land frequently resulted in extreme fragmentation of holdings (0.1 to .15 ha). Experience has shown that success of the program requires that minimum size of the parcels be at least 0.25 hectares. Villagers will therefore be faced with the difficult choice of determining the final list of participants which will then be given to the project staff. Possible problems with such lists are discussed below.

14. Verification of the list of participants
Field investigations in previous evaluations have revealed that some participant lists contain large numbers of individuals from a single extended family and systematically exclude others.(1) Since this may not only result in conflict but also contradicts the strategy for equitable participation, the social scientist will conduct a field investigation to determine the extent to which those selected sociologically represent the span of those individuals who wish to participate. The investigation may reveal that some families or groups are receiving a disproportionate number of parcels and that those excluded believe their interests have not been adequately considered. If this occurs, the social scientist and animation team may ask village authorities to call a meeting to resolve the issue.

15. Resolution of participation/Equity issues. (If necessary).
The role of the project staff in helping to resolve issues of participation and equity cannot at this time be determined. It is a matter for each project team to work out with their counterparts in the RDAs and village authorities. The staff should present its analysis of the situation, express its concerns at a village meeting, and allow for a solution using traditional mechanisms of decision-making;

As villages request expansion or construction of new perimeters, the staff should develop guidelines for the participation of groups and individuals who are still without irrigated land. This should be done cautiously and designed to prevent serious inequities in the distribution of benefits.

16. RDA approves engineering plan
This will, in most cases, be the approval of the draft plan with or without a few minor modifications.

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(1) While some abuses have been uncovered, problems of this type do not seem widespread.

17. Organizational meeting

The first act of the meeting is to present the RDA approved perimeter plan to villagers and explain any modifications. The villagers will then again approve the plan ; in most cases this will be a formality rather than a serious discussion point. If, however, changes in the draft plan affect construction issues such as size and number of parcels and/or exclusion of desired options (e.g. a fish pond), villagers will need time to consider the implications and make necessary adjustments.

The main purpose of this meeting is to resolve any outstanding problems and to discuss organizational and contractual arrangements with the participants. The animation team will outline requirements for :

- The organization of perimeter associations (groupements de producteurs) and the formation of subgroups within the perimeter (e.g. those sharing a secondary canal).

- Development of perimeter association by-laws that take into account existing national laws and particular needs of the participants.

- Clarification of the contractual agreements between the RDA and the perimeter association. Rights and obligations of each party to the contract and the sanctions to be applied to each if the terms of the contracts are not respected must be outlined.

- Definition of relationships between existing and new perimeter associations.

- Enumeration of technical roles for which villagers will be trained (e.g. pump operators, extension-education, management of perimeter association,etc.). The content and timing of training activities will be presented and the villagers will be asked to consider the selection of individuals for special training.

- Establishment and management of a fund (caisse d'amortissement) for pump replacement and other financial transactions. It is strongly recommended that the project establish a minimum contribution from each participant to set up this fund and that it be collected as a precondition to construction. An initial contribution between 1000 to 3000 CIA is acceptable ; the higher figure is preferable. The development of a coordinated staff policy for initial resource committments from villagers is a critical activity whose importance will increase with perimeter expansion.

- Design of a schedule of activities and village responsibilities during the construction phase.

- Selection of crops to be cultivated.

These topics will be discussed with the villagers ; they will be asked to continue discussions among themselves and take necessary actions before the project continues. These actions include formation of the perimeter association, election of the association's management committee, selection of candidates for training, and collection of funds. This process will take one to two months during which time the local extension agent, members of the animation team and the social scientist will make regular visits to the village, clarify issues and demands, and assist villagers when requested. Participants will review the contractual requirements and negotiate modifications with RDA officials.

19. Contracts signed between RDA and the perimeter association. CRITICAL POINT.

This meeting occurs after all outstanding issues have been clarified among participants, and between the perimeter association and the RDA's and/or other parties (e.g. banks). This is to be a formal ceremony during which :

- The contract is signed.
- Officials of the perimeter association are formally installed.
- Candidates for training are presented.
- A box to keep funds presented to the treasurer (and, possibly, an account book at the local bank).
- Participants' decision on crop choices presented.
- A date set for beginning construction.
- A celebration is held.

A written record of this meeting will be typed by the RDA office and copies sent to the perimeter association. It will include :

- Copies of the contract.
- A plan for the perimeter.
- A final list of participants including those designated as officers and local technical specialists.
- A schedule of training activities.
- An outline of stages of construction indicating time and manpower requirements.
- A list of agricultural inputs needed and who will be responsible for providing them. (It may prove necessary for RDA's to continue supplying certain inputs and pump parts until alternate sources can be sufficiently developed.).
- Any other arrangements agreed upon.

Stage III Construction

20. Construction begins and agricultural inputs ordered
Details of this will be worked out between participants and the organization responsible for construction. Steps will be taken to assure that all agricultural supplies are ordered with sufficient lead time to assure their arrival before agricultural activities begin. Construction work-groups will be organized.

21. Technical training for perimeter specialist and managers.
Training programs for pump operators include pump maintenance, repair and water management. Other training programs for perimeter leaders or organizational , financial and management issues will be organized where necessary. In cases where some innovations are being introduced as part of perimeter development - e.g. fishponds, woodlots, animal traction - special training sessions will be organized. Most training will take place in villages and training centers in the zone.

22. Major canal completed, pump installed.
Villagers will participate in the construction and learn skills useful for perimeter maintenance. The primary system will be tested and corrected.

23. Water management and irrigated agriculture training.
Training staff will be in the village for sessions on the construction of secondary and tertiary canals, perimeter maintenance schedules and procedures, preparation of soil for planting and the organization of water allocation procedures. Sub-groups will be organized to assume responsibility for maintaining sections of the canal network. Some training on cultivation techniques may also begin at this time.

24. Construction of irrigated perimeter completed.
All systems will be tested and final adjustments made.

25. Canal maintenance system established.
Rules and schedules for water allocation and canal maintenance will be reviewed and agreed upon and sanctions for non-compliance established. Procedures for the collection of water use fees and other financial needs are determined.

26. Agricultural inputs in place.
Seeds, fertilizer and equipment needed for planting will be available in the village or a nearby warehouse.

27. Perimeter ready for planting.
Regular schedule of extension-education and training activities will begin.

The chart on the following page summarizes the major activities and outlines who will be involved, where they will occur and their duration.

NETWORK PLAN SITE SELECTION - TRAINING - CONSTRUCTION

E V E N T	P L A C E	PRINCIPAL ACTORS	APPROXIMATIVE TIME/DURATION
0. Start : Advise village of visit.	Village	Animation Team/village leaders	1-2 weeks before visit
1. Orientation meeting.	Village	Animation Team/village leaders/ interested villagers	One day
2. Socio-economic background survey.	Local, regional, national RDA HQ, OMVS Saint-Louis	Sociologist/Animation Team/, Social scientist with the RDAs, OMVS and the River Basin Development office.	One week
3. Socio-economic field reconnaissance survey.	Village	Sociologist/Animation Team/ villagers	One week
4. Visit existing neighboring Perimeters	Village or nearby village	Technical Team RDA/Sociologist/Animation Team leaders of major social units, potential participants	One day (wait one week)
5. Decision point : if villagers approve, then : Survey of potential construction sites identified by villagers : Preliminary (or final) selection.	Village	Technical Team/Sociologist/ village leaders and owners/ Animation Team	One day (wait one week)
6. Final Site Selection	Village	Technical Team/Sociologist/ village leaders and owners/ Animation team	One day

NETWORK PLAN : SITE SELECTION- TRAINING - CONSTRUCTION

E V E N T	PLACE	PRINCIPAL ACTORS	TIME/DURATION
7. Topographic survey conducted : Boundaries marked.	Village and RDA Engineering Office	Technical Team, village leaders Land owners, Sociologist.	3 days
8. Draft of perimeter plan completed.	Local RDA Office	RDA engineers	2 weeks after survey completed
9. Socio-economic study on : land tenure, land use, labor supply, identification of key social issues.	Village	Sociologist.	1 - 2 weeks-
10. If necessary, resolution of outstanding land tenure issues	Village	Sociologist/villagers leaders/ Land owners	2 - 3 Weeks
11. Review, modification, approval of draft perimeter plan by villagers.	Village	Villager, potential participants, land owners, RDA technical team, animation team, Sociologist	1 - 7 days (About 2 weeks after survey is completed)
12. Participation/Planning Meeting. Guidelines for selecting beneficiaries discussed/established	Village	Villagers, leaders, land owners, animation team, Sociologist.	1/2 day (immediately following approval of draft plan).
13. Villagers complete list of participants.	Village	Village leader, land owners, potential beneficiaries	1 - 2 weeks
14. Verification complete list of participants- review for equity.	Village and RDA Office	Sociologist	One week.

EVENT	PLACE	PRINCIPAL ACTORS	TIME/DURATION
15. If necessary : resolve problems of equity and participation.	Village	Sociologist/Animation Team/ Village leaders, participants	One week
16. Perimeter plan approved.	RDA-National Headquarters	RDA Engineers	4-6 weeks after village approval
17. Organizational Meeting . Issues : village associations contracts, selection of villagers for technical training, construction schedule.	Village	Village leaders, perimeter participants RDA Technical and animation team.	Immediately after RDA approves perimeter plan (one day meeting)
18. Villagers, organize perimeter association, groupements select technical trainees, collect funds for caisse	Village	Village leaders, perimeter animation team (as advisors)	One-two months
19. RDA - village Association contract signed, Agricultural inputs determined	Village	RDA Representatives, villagers	One day
20. Construction begins. Agricultural inputs ordered	Perimeter	RDA Engineers, RDA Agronomist RDA extension agent, beneficiaries	Immediately following contract signing
21. Training of villagers for technical and managerial roles	Local RDA training and village	RDA Training Staff. Village association leaders, volunteers for technical training.	1 - 4 weeks
22. Completion of main canal and secondary distribution system. Pump installed.	Perimeter	RDA Engineers, extension agent, perimeter participants	About 3-5 months after start of construction

E V E N T	P L A C E	PRINCIPAL ACTORS	TIME/DURATION
23. Agricultural extension education of villagers, soil preparation, water allocation and management.	Perimeter	RDA Agricultural extension agent, perimeter participants village agricultural technician	3-4 1/2 day sessions
24. Construction completed.	Perimeter	RDA technicians - perimeter participants	Two weeks
25. Review of water allocation rules and canal maintenance schedule	Perimeter	RDA extension agent, village water management specialist, perimeter participants.	1-2 days
26. Agricultural inputs in village	Village	RDA Staff, perimeter participants.	
27. Perimeter ready for planting	Perimeter	RDA and Village extension staff, perimeter participants	
		Time : 0-27 Minimum Time : 0-27 Maximum	28 weeks 46 weeks

2.7. SPECIAL ISSUES IN PROJECT IMPLEMENTATION : THE SIZE AND EVOLUTION OF IRRIGATION SCHEMES

Various levels of irrigation scheme development and potential for future expansion exist within the project zones and may be broken down into the following categories :

- villages without irrigated perimeters ;
- villages with irrigated perimeters and ;
- large towns where medium to large scale irrigation schemes are planned (Podor) or under construction (Bakel).

Each context presents specific problems and opportunities which will evolve as villagers acquire new skills and the capacity to both assume new responsibilities and expand their perimeters.

The previous section outlined the general site selection approach focusing on micro-level, site-specific data as a prerequisite for planning interventions. This section discusses some of the larger problems and issues that arise in different contexts and phases, and suggests ways in which they may be treated. These contexts and phases are :

- Small Village Perimeters :
  . Introductory phase ;
  . Consolidation/Rehabilitation phase.

- Small Village Perimeters :
  . Expansion Phase ;
  . Consolidation Phase.

- Medium and Large Irrigation Schemes :
  . Lessons from the Past ;
  . Introductory Phase.

2.7.1. Small Village Perimeters : The introductory Phase

The introductory phase for irrigated agriculture development occurs in both :

- Villages without irrigated perimeters and ;
- Villages in which perimeter expansions are targeted towards farmers without irrigated land.

Regardless of whether or not a village has an irrigated perimeter, most farmers have observed the system elsewhere. While preparing the construction and agricultural program for farmers who have little or no actual experience with irrigated agriculture, the following issues should be given special consideration.

1. The need to focus on a limited number of basic water management and agricultural skills.
Learning how to effectively and efficiently operate an irrigated perimeter requires both the acquisition of knowledge and experience in its application - which normally takes a few years. Rather than introducing a large number of complex options, the implementation team should use an incremental approach in the transfer of management and agricultural skills.

2. Determination of the size of the irrigation scheme.
Given the increasing demand for perimeter construction, the team should identify village sites that can easily be expanded. In addition to the topographic surveys, analysis of the actual and potential labor supply is required. In some villages it will be prudent to plan for eventual expansion to 40-50 hectares, while in others it may be feasible to develop 120 hectares. This long range perspective may also disclose land tenure problems which should be resolved before extensive technical planning occurs.

2.7.2. Small Village Perimeters : The Consolidation/Rehabilitation Phase

Most villages in the project zones already have at least one irrigated perimeter. Before adding to the number of irrigated hectares, the implementation team will evaluate existing operations and develop a consolidation/rehabilitation plan for the existing system. The first step is to evaluate the technical, agronomic, sociological and economic conditions on the perimeter.

Within each zone the monitoring and evaluation plan should establish quantitative and qualitative benchmarks to determine how well villagers have acquired the basic technical and managerial skills. This includes :

- production and productivity data ;
- efficiency of water use, pump repair records ;
- state of repair of the canals ;
- financial management and debt repayment record ;
- farmers' knowledge and use of proper agricultural techniques ;
- the ability of the participants to manage tasks such as : supply and distribution of agricultural inputs, marketing and conflict resolution ;
- farmers attitudes towards irrigated agriculture and perimeter operations.

Each zone staff should determine specific indicators and minimum performance criteria to determine how effectively and efficiently the participants are operating the perimeter. The objective during this period is village capacity to operate and maintain productive and reasonably efficient perimeters with minimal outside help.

2.7.3. Small Village perimeters : the expansion phase

Expansion of village perimeters is at the core of the integrated development program. The plan in section 2.6.3.2. (Site selection and construction : an integrated approach) outlines the steps to be followed. Issues that need special consideration during this phase are listed below :

1) The long-range potential for irrigated agriculture.
This includes factors such as :

- Amount of land suitable for irrigated agriculture development.
- Labor supply (local and migrants).
- Size of plots to be allocated to participants.
- Technical options, the mechanized construction of embankments and main irrigation canals, alternative irrigation technologies.

2) The resolution of land tenure issues on all land that would eventually be irrigated from a single main canal.
This is particularly important where the land is shared by two villages and/or where flood recession (walo, hollandé) land is to be developed.[1]

3) The establishment of criteria for participation and plot size on expanded perimeters
In most large villages (2000 - 5000 inhabitants) the purpose of additional second or even third perimeters is to provide access to irrigated land for those who are without parcels. Where the majority of participants on an expanded perimeter are inexperienced, the transfer of basic technical and management skills to these new partipants must not be neglected.

When the profile of participants shifts from individuals with no experience in irrigated agriculture, to those with several years of experience, additional economic and social criteria will be used to guide the selection of beneficiaries and to determine the amount of land to be allocated. These criteria include :

- The productivity of irrigated parcels already being cultivated by the farmer. Those who have consistently had high average yields should be given priority over those with low productivity. This criteria, if agreed on by the villagers, should act as an incentive for farmers to increase production.

- Debt repayment record. Those who have paid all debts to the association should have priority.

- Number of agricultural workers in the family. Families with larger numbers of agricultural workers should be given priority.

- The technology the family will employ on the new land. If

1. This also applies to the rain fed depressions (cuvettes) planned for Mali.

manual cultivation techniques will be used then increases should be limited to between 0.25 and 0.50 hectares per production unit. If animal traction or some form of mechanization (1) is to be used, the association allocating land should consider increasing the size of the parcels beyond 0.50 hectares.

4) Regrouping of perimeter plots
As perimeters expand, some families will eventually own 2-6 parcels distributed among several perimeter units. While many will wish to maintain this pattern, some farmers may prefer to rearrange their holdings to facilitate agricultural work (e.g. the use of animal traction or other equipment). Regulations to guide these exchanges and to determine compensation must be developed.

5) The expansion of perimeters to medium clay (faux hollandé) and heavy clay (hollandé) soils.
The current small village perimeters are being developed on light, sandy soils (fondé) but expansion programs will eventually involve the irrigation of heavier, more productive soils (walo, hollandé).

These expansions will often touch on a number of complex land tenure and management issues and should begin only after research is completed. The research will be used to develop policy guidelines for land registration, compensation and redistribution.

6) Determination of the technologies that will be introduced to increase the productive capacity of the farmers. For example : animal traction programs, small scale mechanization, piping or other water distribution technologies.

7) Anticipation of the sociological issues which will emerge as larger more complex organizations are needed to manage the operation

They include topics as such as : the participation of each social groups ; the composition and autonomy of subgroups (2) within the perimeter association and ; the relationships among groups sharing a single main canal and/or pumping station.

8) Clarification of relationships between the leaders of perimeter associations and traditional political and religious authorities.
While this has not been a major problem in the first phase of small perimeter development, the situation may change as

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1. While the project is not introducing mechanization, farmers in some areas may be able to rent tractor services and/or purchase or rent equipment such as motorized omniculteurs. Some villages are already seriously considering the purchase of small tractors.
2. Anthropological investigation of irrigation projects have revealed that producer groups that are socially and culturally homogeneous are most effective. Thus in any size scheme, it is wise to maximize the autonomy of these units.

irrigated agriculture expands and becomes more important in the economic life of the village. At all phases of the project, the definition of perimeter leadership and its scope of authority must be adapted to the traditional context.

2.7.4. Small village perimeters : the consolidation phase

In small village perimeters the number of participants is low, the technology simple, and production oriented primarily to subsistence. As these perimeters expand, the number of participants will significantly increase, the technology and agricultural methods will grow complex, and production will be increasingly oriented towards regional and national markets. The principle concern of the project staff is to assure that the new technologies and agricultural practices are adapted to local conditions and that villagers learn to use them effectively. In addition, the staff will assist the villagers to develop the organizational framework and managerial skills needed to operate and maintain the larger irrigation network. These problems will be minimal in systems with multiple small pumps and autonomous perimeter groups, but will be more complex where larger pumping stations are operating.

There are several issues the staff will have consider in order to increase the capacity of participants to gain greater control of development activities and derive increased benefits from the expanded irrigation systems. A partial list is presented below.

1. Higher level training for pump operators and others involved in the maintenance and repair of equipment.

2. The transformation of village associations (usually "precooperatives") into more complex organizations or cooperatives. This involves additional training for members as well as for cooperative managers. These organizations should eventually take responsibility for obtaining inputs and may become involved in transportation and marketing.

3. The organization of multivillage associations in which each producer group and village cooperative is represented.

The effective functioning of smaller units must always be assured before their inclusion into more complex organizations. In addition, the functions of the larger associations, including their legal status, must be carefully defined and limited to activities which bring increased benefits to the farmers. One should keep in mind that large scale farmer organizations often result in the emergence of local leaders who abuse their authority and initiate activities not always consistant with the best interests of the members. Strong local organizations that are capable of defining and protecting their role within a larger association constitute the only constraint against this potential danger.

2.7.5. Medium and Large Irrigation Schemes

1. Past Problems

The first generation of large irrigation schemes concentrated on the rapid expansion of water management technology to increase food production. Construction and operations were heavily mechanized ; all planning and management decisions were controlled by development corporations without farmer participation. The sociological aspects of irrigated agriculture were not considered and farmers were viewed as components of a productive enterprise. The failures and problems of these large schemes have been documented in the OMVS Socioeconomic Study (1980) and other research and evaluation reports (see bibliography).

The socio-psychological impact of the large-scale development projects alienated farmers from the land and undermined the complex sociocultural framework within which productive activities were traditionally organized. The economic failure and social conflict generated by this approach has, however, been recognized by the development corporations and new policies based on principles which support decentralization of management and farmer participation in the decision-making process have been adopted. The challenge faced by the implementation teams is, therefore, primarily one of avoiding past errors and adapting the positive features of small irrigation schemes into the design and management of medium and large operations.

2. Positive lessons from medium and large perimeters

Experience acquired from operations at Guédé, a medium-sized perimeter in Senegal, and decentralized activities currently used in Lampsar (Senegal) and Gorgol (Mauritania) suggest that the size is less of an issue than organization and management. This occurs when :

- The perimeter is organized to function operationally as a cluster of village schemes.

- The size and composition of producers associations is determined through sociological investigation and the participation of the members. As a general rule, the more homogeneous these groups are with respect to socioeconomic status and ethnic identity, the more smoothly they function.

- Producer groups are permitted autonomy in determining crops to be cultivated, agricultural inputs to be used, how work is organized, the marketing of crops and the resolution of conflict.

- Farmers participate in overall perimeter management and the training and are effective in this role.

- A flexible plan for perimeter expansion is deployed so that groups share equally in the use of different types of soil that are eventually developed.

- The management and technical assistance staff responds to farmer needs.

- Long range plans emphasize the increased responsibility and participation of the farmers in perimeter management and provision of technical services (e.g. local inhabitants trained in pump and equipment repair, cooperative management and agricultural extension techniques).

- Management of the engineering works is both effective and efficient.

- Training and extension-education programs is of high quality.

2.7.6. Medium and large perimeters : the introductory phase

The key planning and implementation issues in the Bakel and Podor perimeters is how to avoid past errors and build on the positive features of small, medium and large schemes. In both cases, the engineering plans have been developed and technically allow for a gradual, flexible approach to perimeter development. The principal missing elements are :

- Detailed sociocultural and economic information on the populations and their views on optimal schemes management.

- A phased strategy in which sociocultural and economic factors are integrated into perimeter development and management plans. This must detail the categories, levels and responsibilities of operating units and how these will be organized.

- A strategy for farmer participation in planning, management and evaluation.

Some information relevant to these issues is already available. While the RDAs have collected socioeconomic data, much of it remains descriptive and is thus of little use to administrators, engineers, and agronomists. Additional collection and analysis of quantitative, micro-level data is required for projects implementation planning and should take a minimum of four to six months.

This will allow for a high level of farmer participation in the resolution of social and land tenure questions before construction begins in Podor or production begins in Bakel. Other issues involved in developing larger perimeters are addressed in the following guidelines.

1) Adaptation of the integrated approach to site selection and construction (section 2.6.3.) as to the technical and social conditions in Bakel and Podor. The steps outlined above remain essentially the same with a major change in the duration and pace at which specific events can proceed.

2) The sociocultural analysis and organization of production, water distribution and perimeter management units requires special attention to :

   - Flexibility in the composition and size of water-using groups.

   - Acknowledgement of ethnicity, residential affiliation (village or urban "quarter") and socioeconomic status in planning the layout of the perimeter plots.

   - Maintenance of the functional autonomy of water-using sections.

   - A clear definition of the rights and responsibilities at each level within the perimeter organization.

   - A clear definition of the relationships between different groups and organizational levels.

3) A long-range plan to gradually increase the participation and responsibility of producers to plan and manage the perimeter.

P A R T III

SOCIAL INSTITUTIONAL ANALYSIS OF THE PROJECT ZONES

2.8.1. Podor Project Zone
2.8.2. Bakel Project Zone
2.8.3. Kaédi Project Zone
2.8.4. Gouraye Project Zone
2.8.5. Kayes Project Zone.

2.8.1. Podor Project Zone

A. Socio-Economic Profile of Project Zone

The Podor project zone is located in the Département of Podor in the western part of the Middle Senegal River Valley. The département's population is close to 150,000. However, according to a recent GERSAR report, the population of the Podor project zone, which encompasses the urban commune of Podor and several neighboring villages, is less than 14,000.

The Tukulor constitute the dominant ethnic group in the zone with 49.2% of the total population. Next come the Wolof with 28% ; then the Moors with 14.5% ; and the Peuls with 4.3%. The ethnic mix is slightly different in the commune of Podor, which has a larger percentage of Wolof (34%) and Moors (18%) and a smaller percentage of Tukulor (41%).

Historically, the project zone was part of the province of Toro of the Tukulor state of Fouta Toro. Tukulor on both sides of the Senegal River found themselves in frequent conflict with the Moor emigrants to the north and many moved to the Senegalese side of the river to escape Moor domination. During the middle of the nineteenth century, the French under the leadership of Governor Faidherbe began their conquest of the Senegal River. They defeated the Moors and ended Moor control over river trade. At this time, Podor, which had been an important trading post, was transformed into a major French military post. As the French advanced, they came into conflict with Umar Tall, the Muslim cleric and warrior who introduced the Tijaniya order to Senegal. Many Tukulor men left the Fouta Toro region during this period to escape French domination or to fight with Umar Tall's armies which conquered much of the Western Soudan. This touched off a period of population decline which lasted nearly four decades.

Like many other Senegal River towns, Podor stagnated economically when the gum trade declined and the center of economic activity shifted further south to the peanut producing regions of Senegal and Dakar. The rural populations in the project zone had no cash crop to earn a monetary income throughout most of the colonial period. Pratically all that was produced was for self consumption or for the local trade - farmers exchanging millet for milk from herders. Traditional land tenure patterns prevailed with the Tukulor nobles controlling most of the Walo lands and exacting rents from those who farmed them.

The Podor project zone is located in one of the driest areas of the Senegal River Valley. Rainfall averages only 300-400 millimeters in a normal year, barely enough to sustain a decent crop in good years. This increases the area's dependence on flood recession agriculture for survival and is the reason why Podor was one of the hardest hit areas during the droughts of the late 1960s and early 1970s when floods were very limited.

Podor's economic poverty and harsh environment led to massive outflows of people beginning in the early 1950s and this increased further during the drought years. Podor commune now has the lowest male-female ratio (.81) of any urban area in the Fleuve region. This underscores the lack of economic opportunities in the town that creates an exodus of Podor residents to Dakar and elsewhere in search of work. Like many small rural towns in West Africa, Podor has a large percentage of people working in the primary sector. Nearly 40% are farmers or/and fishermen. Many Podor farmers cultivate land on the other side of the river in Mauritania and elsewhere in the project zone. Since the drought, fishing has declined in this area. About 25% of the population are merchants or artisans. A similar percentage works for the government and include administrators, school teachers, technical agents, chauffeurs, gardiens, municipal employees, and unskilled labor. Podor has no industry.

Podor's economic growth since independence has suffered from its poor infrastructure. Until the late 1970s, Podor was cut off during the rainy season because it lacked a bridge to link it to the national highway to the south. In 1979, the Senegalese government built a bridge accross the Doué thus ending Podor's isolation and followed this up with a paved access road in 1980 which links Podor directly to the main highway. When compared with other Senegal River towns such as Dagana, Richard Toll, and Matam, Podor is poorly equipped. It has no hospital or lycée, and electricity only part of the day. Even more significant is the fact that Podor is the only departmental capital in the Fleuve region not to have its own irrigated perimeter or other important agricultural projects. Podor residents have complained about this situation and demanded their own perimeter to end the "discrimination" against Podor.

B. History of SAED Interventions and Related Development Activities in the Podor Project Zone

The introduction of irrigated agriculture in the département of Podor dates back to 1945 when it was first introduced in the village of Guedé, located between Podor and N'Dioum.

During the early 1960s, the Senegalese government established the Organisation Autonome de la Vallée (OAV) to promote the development of irrigated agriculture in the Middle Valley. The OAV coexisted with the Organisme Autonome du Delta (OAD) which was charged with promoting irrigated agriculture in the Delta region. Both agencies used controlled submersion methods and lacked the financial means and skilled manpower to properly supervise their projects. In 1965, the OAD and OAV gave way to SAED, which became responsible for irrigated development in the Fleuve region. Throughout most of the 1960s, SAED's efforts were concentrated in the Delta region. However, with the drought, it began to pay greater attention to the Lower and Middle Valley and began several major projects during the early and mid 1970s.

The most important SAED intervention in the department of Podor has been at Nianga. In 1972, the Senegalese government signed an agreement with FED for financing of a large-scale perimeter at Nianga. This project involved 16 villages including Guia, one of the most important villages

in the project zone. At first, only 4 villages were to be involved, but demands from other villages in the vicinity seeking access obliged SAED to expand the number of villages participating in the project. A 20 kilometer dike was constructed to protect perimeter land from flooding. Unfortunately, the dike also prevented Walo lands from being flooded, thus depriving farmers of the possibility of cultivating their Walo lands. The Nianga experience became notorious throughout the Middle Valley for its "destruction" of Walo lands and aroused considerable anguish and opposition to SAED large-scale perimeter projects among large segments of the population who relied heavily on their Walo lands. In fact, much of the initial opposition and present apprehension of conservative Podor Walo landholders is due to their fear that SAED will do the same thing -- i.e. dike up Walo lands -- as they did in Nianga--and thus "kill" their land.

Since cultivation began on the Nianga perimeter in 1975, the perimeter has suffered from many of the problems common to other SAED large-scale perimeters. The organization of farmers on the perimeter left much to be desired. In the first place, the farmer associations (groupements de production) were not very cohesive. Individual farmers had to join a groupement to have access to land. The groupements did not have much control over individual farmers who would not respect the regulations. Most farmers saw the perimeter as providing a means of food security and hedging their bets during a period of drought. Most had other activities which often interfered with their participating fully in the perimeter. There were frequent withdrawals on the part of both individuals and groupements that were dissatisfied with low incomes and high debts from irrigated agriculture. There was also little dialogue between SAED agents and the farmers. Poor management, late deliveries of inputs, and poor perimeter maintenance plagued the operation of Nianga. As a result, the entire 750 hectares within the perimeter have never been fully cultivated. During the early 1980s, SAED has made plans to increase the authority of farmer associations in line with its new evolutionary self management philosophy and has sought new capital to rehabilitate Nianga. The Nianga perimeter is only 10 kilometers from Podor.

During the mid-1970s, SAED also initiated a program of small village perimeters in the Aeré-Lao sector in the eastern half of the department of Podor. The small perimeters had fewer land tenure problems because they did not touch Walo lands. There were, however, occasional disputes among different villages contesting the same land. SAED gave the farmer associations more autonomy on the small perimeters. The main losers were the Peul herders, who saw their traditional grazing lands reduced by the construction of irrgated perimeters. On the other hand, former slaves and previously landless peasants often benefitted because SAED gave them access to perimeter land on a more or less equal footing. Although SAED was not as heavy-handed in supervising the small perimeters as it was on the large perimeters, the local populations were not satisfied with SAED's performance and frequently complained about late delivery of inputs, SAED agents charging for services which were supposed to be provided free, and high debt levels resulting from the obligation to pay for irrigation costs even when procution was low. Villagers often referred to the time when the Chinese worked with the farmers in the Guedé perimeter. With the Chinese there was always plenty of money left

to repay irrigation costs and earn a profit. Or so the legend goes.

During the early 1980s, SAED began to change its stance towards the farmers and make a greater effort to win their support. It has recognized some of its principal weaknesses -- overcentralization, heavy-handed management techniques, lack of sensitivity to farmer demands, poor perimeter maintenance, etc -- and has pledged to take the necessary measures to remedy the situation.

It remains to be seen whether SAED will change enough to win the confidence of the local populations. In the Podor case, there is some evidence that SAED has, indeed, become more responsive to local concerns. Thus, instead of immediately diking off all the Walo land as it had initially intended, SAED agreed to another plan which provided an intermediary dike which would leave the main Walo lands untouched for many years. This comprise sharply reduced the intensity of the opposition to the project on the part of some of Podor's major traditional Walo landowners.

The Podor perimeter now being planned is one of the few large-scale urban-based perimeters in Senegal. Planners should profit from the Dagana perimeter experience and attempt to avoid some of the major mistakes made there, which included :

1. SAED domination of all technical aspects of decision-making. Little effort was made by SAED to discuss and explain technical issues to local populations or to listen to their concerns about land use.

2. Overmechanization due to strong demands of urban leaders for more advanced technology. The average horsepower per hectare used in Dagana was higher than the average in the U.S.A. The result was high production costs and high debt levels. Podor residents have to be convinced that the use of simpler machinery and animal traction can be just as "progressive" as large tractors and certainly far more economical.

3. Arbitrary recruitment of participants with allocation of parcels determined largely by local political leaders favoring their own followers in the distribution of land.

C. Political Institutions.

Of the three OMVS countries, Senegal has the most active local political institutions. The department of Podor is highly politicized and well-connected to national politics. It has two deputies representing it in the National Assembly and one government minister. Podor's political institutions are currently dominated by the Parti Socialiste (PS), Senegal's ruling party. Within the PS, there are usually rival political party apparatus (comité de coordination départementale). During the early 1960s, Podor was a stronghold of the followers of the Prime Minister, Mamadou Dia, who started several human investments and rural animation projects there. After Dia's fall from power in December 1962, the Diaistes were purged and the département went into a period of political

decline. With the resurrection of competitive party politics in the late 1970s, political life revived ; former Diaistes rejoined the party and were given high party posts, and the government directed more resources to Podor.

Like all Senegalese communes, the town of Podor has an elected mayor and municipal council. The current mayor is a charming octogenarian who has been active in Senegalese political life for nearly half a century. The mayor strongly advocates the proposed Podor perimeter. He sees irrigated agriculture as a sign of progress and asserts that his region must move with the times. Although critical of SAED's past efforts, he, nevertheless, sees SAED as becoming more responsive to local population's wishes. He dismissed criticism of the proposed project as politically motivated and insisted that he had the great majority of the population behind him. The construction of the Podor perimeter is high on SAED's priority list because President Abdou Diouf while still Prime Minsiter, had promised the people of Podor that they would get their perimeter. With the national elections coming up in 1983, the government is trying very hard to keep its promise.

Opposition to the project is strongest among the traditional Tukulor walo landowners in Podor's two oldest neighborhoods. They are backed by most of their traditionally associated artisans and laborers. Members of opposition political parties from Podor having traditional land rights in Podor but now living and working in Dakar also oppose the project. In general, the political opposition in Senegal has attacked SAED as an instrument of government repression and exploitation of the rural masses.

The mayor and municipal council have a voice in allocating communal land. Some of the land in the project zone, however, belongs not to Podor but to local villages. The local villages in the project zone are part of the Rural Community of Guedé village which regroups 35 villages. The rural Council of Guedé theoretically has power to allocate village land within its jurisdiction. This includes land that is part of the proposed Podor SAED perimeter. There is thus a possibility of conflict between Podor commune and the Rural Council as to how to allocate perimeter land. The land tenure issue is further complicated by SAED's claim that it has the authority to allocate land for perimeter use, thanks to the 1964 National Domaine law. The situation becomes even more complicated when one considers the demands of individual villages like Guia which demands that traditional land rights be respected. It will take careful analysis to sort out the different jurisdictional claims to land allocation authority and the tactful negotiations to come up with a plan that will be acceptable to most of the parties concerned. Any attempt to push through a solution without consulting the local populations concerned will certainly lead to serious problems in implementing the project.

D. Administrative Institutions

The IDP project zone staff will not have much contact with the Governor, who is based in Saint Louis. Podor is one of three départements in the

Fleuve region, the other two being Dagana and Matam. The central departmental administrative official is the préfet. The préfet is the administrative superior of all the technical agents working in his département. He presides over the Departmental Development Committee which meets periodically, usually once a month, to discuss the state of development programs and projects going on in the département.

Since the proposed Podor perimeter is a major development project involving the town of Podor, the préfet has worked closely with the major of Podor and SAED officials in enlisting support for the project. Since one of the préfet's main duties is to keep the peace, it is in his interest to see to it that a general consensus concerning the acceptability of the project prevails. If any violence occurs because of land disputes or any reasons related to the project, the préfet will have the unpleasant task of intervening to restore the peace. As a representative of the national government, the préfet often puts pressure on the local populations to adhere to government programs.

The sous-préfet is the main government administrative official at the arrondissement level. The arrondissement of N'Dioum is the only arrondissement in the project zone. The sous-préfet is formally under the authority of the préfet. The sous-préfet also draws up the budget for the Rural Councils in his arrondissement and is responsible for its execution. The Centres d'Expansion Rurale (CER) are also located at the arrondissement level. The CER provides a variety of technical services to the populations in the arrondissement and works closely with the Rural Councils.

The IDP staff will be working with both the préfet and the sous-préfet based in N'Dioum since the project involves both an urban and a rural area.

E. Technical Services in the Project Zone : Linkages with the Project Zone

(1) Eaux et Forets

SAED has an Eaux et Forets section which is supposed to deal with development activities such as fishponds, reforestation, wind-breaks, etc. in its zone of operations. This section is sparsely staffed and not very active. Moreover, the Eaux et Forets personnel attached to SAED are not encouraged to pursue the environmental concerns of their colleagues in the Eaux et Forets Service. For example, some Eaux et Forets agents attribute part of the decline of fish production in the Senegal River to pollution caused by the Senegal Sugar Company and by fertilizer drainoff in SAED perimeters.

SAED has cooperated with the Eaux et Forets Service and the Peace Corps in fishpond projects on irrigated perimeters along the Senegal River. SAED built the fishponds while Eaux et Forets agents and Peace Corps Volunteers did the extension work with the farmers. The Department of Podor has fishpond projects in three villages with irrigated perimeters. The pisciculture projects have thus far proven to be popular. However, some of the managerial problems still have to be worked out. For example, nearly all the male heads of houshold are members of the fishing cooperative created around the fishpond project. Since production still remains on a

small scale, the benefits per member are very small -- perhaps a day or two's supply of fish for each member. There is thus, little incentive for the village designated fishpond managers to work hard and do all the work. On the other hand, if all the villagers agree to do a little bit, it is difficult to see to it that everyone does his share when he is supposed to. The IDP team will be working in an urban environment and will have to work out somewhat different arrangements in organizing interested Groupements de Producteurs to manage their fishponds.

Podor used to be an important fishing center before the drought. Today production is down to but a fraction of what it used to be. Podor has several fishing cooperatives. But none are really functioning well because its members are not putting up sufficient capital for the crop's social equity. The Mbojene quarter of Podor has a large number of fishermen. This quarter is also one of the strongest supporters of an irrigated perimeter for Podor and probably would welcome a fishpond project for its part of the perimeter.

The town of Podor itself would provide much of the market for fish produced in the fishponds. Women could organize the local marketing of the fish. A women's group might conceivably also want to manage one of the fishponds.

The Eaux et forets service is also prepared to provide extension work for windbreaks and small fruit projects. The Regional Inspection has agents at both the departmental and arrondissement levels. The main problem is the usual "manque de moyens" (lack of means) to enable forestry agents to do extension work.

One problem which the IDP design team has not dealt with is how to replace the wooded land which will be lost as a result of perimeter construction. The earlier phases of the project call for clearing heavily wooded areas. One justification for beginning perimeter construction in the wooded areas was that there would be fewer land tenure problems since the land was not being cultivated. However, this creates other problems. The development of the construction site plan will look into the environmental impact of clearing this wooded land and attempt to find some ways to mitigate its negative effects.

(2) Cooperative Service

SAED has its own cooperative section which is under the supervision of the Division de la Production. The SAED coop section organizes the groupement de producteurs on the SAED perimeters. SAED has, however, only three coop agents to cover the entire Senegal River Valley.

The future status of the regular cooperative service (Direction Nationale de la Coopération) is still unsure. Its regional office, the Inspection Régionale de la Coopération, is based in Saint Louis. At the present time it is primarily concerned with organizing and providing coop education to the following specialized groups : (1) fishermen ; (2) herders ; (3) artisans ; (4) butchers ; (5) dairy products processors ; (6) woodcutters and charcoal makers; (6) consumers;

(7) peanut and millet farmers ; and (8) truck farmers.

A certain rivalry exists between SAED, which has had the monopoly of organizing rice cooperatives, and groupement de producteurs in the SAED perimeters and the regular cooperative service. SAED wishes to absorb most of the functions now being carried out by the regional coop service while the cooperative service for its part considers itself more qualified and more attuned to organizational issues than SAED because it is less "productionist" in orientation. The government is now debating whether to transfer coop agents to the RDA's or to provide the regular cooperative service with sufficient means to carry out its coop education mission. The regional coop service has agents at the departmental and arrondissement levels.

(3) Promotion Humaine

The Secrétariat d'Etat à la Promotion Humaine (SEPH) has been traditionally one of the main government service critics and rivals of SAED and other RDA agencies. Promotion humaine is active in the department in several areas :

1. Promotion Humaine agents are responsible for providing literacy and civic education programs to the Rural Councillors ;

2. Promotion Humaine supervises the CER's in the department. The CER at N'Dioum which services some villages in the project zone is one of the most dynamic in the Fleuve region. There is considerable competition and rivalry between Podor and N'Dioum for the economic leadership of the department. N'Dioum grew far mor rapidly than Podor when the paved highway connecting St. Louis to Matam was completed in the 1960s. The CER's are considered by many Senegalese to be partisans of participatory development and preferable to the RDA's as development institutions because they are multidisciplinary, concerned with the overall well-being of the rural populations and closer to the grassroots. In the past, the CER's have not received sufficient resources to carry out their missions and most have tended to languish. Critics have caustically referred to the CERP's as Centres de Repos Permanents.

3. Promotion Humaine Monitrices based at the CER level provide educational services for village women at the arrondissement level. The Animation Service, often in collaboration with the Peace Corps, organizes various women's projects such as vegetable gardens.

4. Promotion Humaine also organizes diverse small-scale community development projects at the Rural Community level.

5. There is a Maison Familiale Rurale at Guedé which provides training for over 400 youg women and 155 young men.

Although SAED has its own functional literacy section, it often relies heavily on Promotion Humaine to provide the agents training and materials to carry out functional literacy programs. In the Podor project zone, these programs will be in Pular and Wolof.

F. Donor and PVO Activities in the Project Zone

While there is little donor activity going on in the immediate project zone (Podor and vicinity), there is considerable activity going on in the department of Podor. Holland has financed an important SAED small village perimeter program at Cas-Cas ; FED financed the Nianga perimeter ; the Chinese financed the Guedé perimeter (and enjoyed great popularity among the local populations for their willingness to work side by side with local farmers and for their success in obtaining higher yields) ; and FED has financed some village perimeter projects on the Ile de Morphil.

SAED has several important irrigation projects for which external donor funding will be sought during the 1980s. SAED is loooking to the African Development Bank to finance the rehabilitation of the Nianga perimeter, and hopes that FED and Kuwait will finance perimeter development in the zone between Podor and Aeré Lao (excluding Cas-Cas), and is looking for donors to fund the rehabilitation of the Guedé perimeter. The SAED program also calls for the electrification of most perimeters in the Department of Podor.

The southern part of Podor department used to be a major arabic gum producing area. FED and Holland are financing large-scale reforestation programs of gum trees.

One of the most interesting PVO projects in the area is the Projet Intégré de Podor (PIP) based in N'Dioum and financed by CIMADE and the Service Oecumenique d'Entraide (SOE). The history of the project dates back to 1973, when CIMADE and SOE distributed millet to 17 herder villages hardest hit by the drought. In 1974, the European based PVOs met with the local populations and administrative authorities to plan several development activities in the department in the following areas : (1) well and forage construction ; (2) agricultural projects ; (3) herder programs ; (4) health programs ; and (5) measures to protect villages against floods and isolation during rainy season.

The most interesting aspect of the project was the effort to organize an inter-village association to bring all the villages in the department together to organize small-scale development projects. The new association called itself Diokeré-Endam or Brothers United and in 1981 claimed that 140 of the 250 villages in the Department of Podor were represented with a membership of well over 14,000. Brothers United works closely with the N'Dioum CER from which it obtains considerable technical advice. One of its major promoters is the director of SICAP in Dakar.

Relations between SAED and the PIP are not very good. The villages that most enthusiastically support the Brothers United are often those the most hostile to SAED. The group claims that SAED won't permit Brothers United to organize their own small village perimeters. The group proudly adheres to a philosophy of self-reliance and self-management and attacks SAED for heavy-handed and inefficient management techniques and lack of interest in the views of the populations it is supposed to be servicing.

PIP has some influence in Podor where it has been trying to organize the youth of Podor to run a small vegetable project. This particular project has not been very successful because insufficient numbers of youth come regularly to tend their plot of land.

The IDP staff should watch the PIP experience closely and see what can be done to build better relationships between SAED and PIP. In the future, the USAID/Senegal might look into the possibility of financing PIP projects under the PVO/Coop Sector Grant, if that project should be approved.

2.8.2. Bakel Project Zone

A. Socio-Economic Profile of Bakel Project Zone

The Bakel Project Zone is located in the Département of Bakel in Eastern Senegal. Most of the zone is located within the arrondissement of Ololdou which extends upstream and downstream from Bakel, the departmental capital. The project zone touches a population of 25,000 to 30,000 people, of which approximately 8,000 live in the commune of Bakel.

The Soninké are the predominant ethnic group in the arrondissement of Ololdou. They comprise 69% of the total population. Next come the Tukulor with 14%. The Tukulor are concentrated primarily in the western part of the arrondissement towards the department of Matam. The Peul who live away from the River constitute 10% of the population. The ethnic mix is different in Bakel commune, however, where the Soninké and Tukulor comprises only 50% and 10% of the population respectively, and nearly one-third of Bakel commune's population is made up of Bambara and other ethnic groups found in Mali. Three percent of Bakel's population is Wolof. These Wolof are mostly government officials or merchants originally form outside the region.

Historically, the Bakel project zone was part of the Soninké kingdom of Gajaaga. During the 17th and 18th century, the Soninké were active in gold and slave trading. When the French expanded their trade among the Senegal River in the 19th century, they established a trading post at Bakel. Later as the slave trade died out, the Soninké merchants and nobility used their domestic slaves to produce peanuts, cotton, and cloth for trade. By the end of the century, nearly half of the population were slaves. Towards the end of the century, the Soninké, under the leadership of Mamadou Lamine resisted to French conquest but were eventually defeated and placed under the jurisdiction of three separate colonies -- Senegal, French Soudan, and Mauritania.

In the early 20th century, the establishment of the Dakar-Bamako railroad and the development of the peanut economy in Senegal led to the decline of river trade. Bakel suffered like most of the Senegal river towns. The end of the slave-based economy and decline of trade led many Soninké to emigrate. Many went to grow peanuts in the Gambia and Senegal. Others became sailors or traders. This pattern of emigration took place before World War II. After World War II, many Soninké men sought work in France as industrial workers and day laborers, and Bakel continued to stagnate economically. Because of its long distance from the coast and its poor road infrastructure, Bakel remained outside the mainstream of the Senegalese economy. Along with Kédougou, it was a place where the colonial administration sent officials as a demotion or punishment.

After independence, the project zone continued to be neglected until the mid-1970s, when irrigation projects were first introduced to the area. A paved road connecting Bakel to the main Senegal River highway system and Saint Louis is expected to be completed by the end of 1982. This will end Bakel's isolation during the rainy season. Plans are also being made to improve the road between Bakel and Kidira, which is a laterite connection to Tambacounda.

Villages in the project zone are larger than the average in Senegal, with most between 1,500 and 3,000 persons. The per capita incomes in the project zone are higher than in other rural areas in the Fleuve region, largely because of the remittances sent home by Soninké emigrants working in France. Trade is also more lively in Bakel than in Gouraye on the other side of the river. The outmigration of the adult male population means that women have to do relatively more work and that many families rely on seasonal labor recruited from more isolated populations in the zone or from across the border in Mauritania or Mali.

The rainfall in the Bakel project zone is higher than in Podor and the Walo lands are therefore relatively less important. This means that land tenure disputes over Walo land allocation in irrigation projects are less acute, and that dryland agriculture can provide an alternative to irrigation in normal rainfall years.

B. History of SAED Interventions and Other Related Development Activities in the Bakel Project Zone

The history of SAED interventions in the project zone is exceptionally well documented, thanks to studies by Adrian Adams (Le Long Voyage des Gens du Fleuve) and Robert Aprin, (Développement et Résistance Paysanne : Le Cas des Soninkés de Bakel), and USAID's involvement in the zone since 1974/75.

The introduction of irrigated agriculture was initiated by a group of Soninké emigrant workers in France who sought some financial aid and support from Paris-based PVOs in 1974. The CIDR provided a French technician to get the project started. And an emigrant leader from Koughany village organized a Federation of Soninké villages to carry out the project. Oxfam of Great Britain financed the project in its earliest stage. One of the interesting characteristics of the Soninké organization of the perimeters was the use of collective fields rather than individual family plots.

Once the project began, it soon came into conflict with SAED which was given responsibility for developing the Upper Valley at that time. The technician working for the project was accused by SAED of stirring up trouble because the local populations did not want to be supervised by SAED. The technician continued to stay on, but as SAED's "chef de projet". This created dissension in the area and engendered backlash against SAED, led by the original initiator of the project. At this time, OXFAM withdrew its financial support, and War on Want, which had been thinking of providing some funding for the perimeters, backed off, eventually winding up in the Guidimaka region of Mauritania.

The Americans entered the picture in late 1974 after a USAID mission visited the area and offered some aid in the form of motorpumps. By 1975, SAED had established its control over the irrigation projects in the area, and in 1978 USAID started its Bakel Irrigated Small Perimeter Project, which touched 25 villages in the project zone. USAID had previously introduced a livestock project in the area.

Today, relationships between the Federation and SAED are somewhat better than they were in the mid and late 1970s. The IDP should be able to work effectively with the Federation since both share a strong commitment to participatory development strategies.

C. Political Institutions

The Bakel project zone is not quite as politicized as Podor. Similar political institutions exist. The commune of Bakel has an elected mayor and municipal council. The center of local politics is in the commune. Bakel has its deputies representing it in the National Assembly and seeking patronage and development projects for their constituents. The zone's rural populations are not as integrated into the Senegalese national political system. The emigrants working in France tend to be radicalized and often hostile to the present regime.

Bakel does not have much clout in Senegalese national politics. The department of Bakel is part of the region of Eastern Senegal, the most sparesely populated region in the country. The Soninké, moreover, are a tiny ethnic minority in Senegal, concentrated almost exclusively in Bakel. The Tukulor in the Senegal River Valley have far more influence because they make up 10% of Dakar's population and have greater access to nation decision-makers.

D. Adminsitrative Institutions

Bakel is far from the regional capital of Tambacounda. The region of Eastern Senegal is vast and road networks the least developed in Senegal. This means that the Governor does not take a very active role in overseeing Bakel development programs.

The most important administrative official is the préfet based in Bakel commune. Since Bakel is in the middle of the Ololdou arrondissement, the préfet is in good position to supervise activities in the project zone. The préfet actively promotes government programs and wor's closely with SAED officials. He also presides over the monthly Departmental Development Committee meetings.

The project zone thus far has no rural communities and rural councils, since the Administrative Reform will not go into effect in Eastern Senegal until July 1, 1982. By the end of 1982 or early 1983, the zone should have several rural communities. It will be interesting to see the extent to which the Soninké Federation will exercize influence within the Rural Councils.

The main regional services are located in Tambacounda which is quite far removed from Bakel. Departmental administrative officials and technical agents often feel neglected and complain frequently about the lack of logistical support from Dakar and Tambacounda.

It should also be noted that the Bakel project zone is the only zone of SAED interventions administratively outside the Fleuve region. This means that local SAED agents can't rely on their superiors in Saint-Louis to work out problems or better coordination and collaboration with technical officials from other services based in Bakel. The regional office of SAED in Saint Louis is even further away than Bakel from the regional offices of the technical services in Tambacounda.

E. Technical Services in the Project Zone : Linkages with the Project

(1) Eaux et Forets

The Eaux et Forets service is represented at the department level and based in Bakel. Right now it is collaborating with SAED and the Peace Corps in fishpond projects in villages with irrigated perimeters. SAED constructs the perimeters and Eaux et Forets agents and Peace Corps volunteers provide extension services. The project was started in 1981 in Bakel. Bakel like Podor also used to be an important fishing area before the drought. In the Bakel area, there are sometimes disputes caused by fishermen coming from Mali to fish in Senegalese waters. At the present time, there are no arrangements between the Malian and Senegalese Eaux et Forets Services to regulate fishing practices. This is a regional issue which should be addressed.

(2) Cooperative Service

The SAED cooperative section is not very active in Bakel. Based in St. Louis, it is very far from Bakel, and is primarily concerned with organizing the groupements de producteurs in the irrigated perimeters growing rice.

The emphasis on collective farming that was prevalent during the early years of irrigation in Bakel has declined. SAED has tried to discourage collective farming. Today, only 25% of the irrigated land is farmed collectively ; only one small perimeter is totally collective . and 15 perimeters have no collective land.

The regular cooperative service has little to do with the perimeters. Like the Fleuve Regional Cooperative Service, the Eastern Senegal Cooperative Service is primarily concerned with specialized cooperatives. It is far more active in the département of Tambacounda which is an important peanut and cotton producing zone.

(3) Promotion Humaine

Promotion Humaine first came into the Bakel project zone in 1975 along with SAED. At that time, Promotion Humaine agents were also closely associated with the USAID livestock project. Their mission was to organize

PART V

OUTMIGRATION AND RURAL DEVELOPMENT

IN THE SENEGAL RIVER BASIN

2.10.1. Introduction

2.10.2. Historical Background

2.10.3. Modern Migration

2.10.4. The Multiplication of Small Irrigated Perimeters

and animate herders to participate in the project. They did not succeed very well for several reasons :

(1) The Promotion Humaine agents did not have the technical knowledge needed to understand and to explain the technical aspects of the projects ;

(2) Although they were working with Peul herders, none spoke Pular ;

(3) They received very poor logistical support, were paid infrequently, and suffered from poor morale.

However, the Promotion Humaine service was somewhat more successful with its women's programs, though this is probably a result of the important role of Soninké women in local agricultural production.

At the present time, Promotion Humaine is not set up to do functional literacy programs in Bakel and it remains to be seen what the role of Promotion Humaine will be in educating Rural Councillors and providing literacy programs once the Rural Communities are established.

(4) Livestock Service

The Livestock Service for the department of Bakel is based in Bakel. The Department of Bakel has considerable livestock resources. In 1969, there were nearly 200,000 cattle, and 317,000 goats and sheep. The USAID financed livestock project in Bakel had sought to improve management of herds and grazing areas. Transhumance is quite important and large numbers of cattle cross the Senegal River each year and many remain near the River in the dry season when other water sources are scarce.

With the expansion of irrigation, there could be some difficulties between herders and farmers. The IDP will finance a study of pastoral problems and monitor cattle movements in and out of the zone, in order to encourage arrangements that will accomodate both herders and farmers. The Rural Communities will have an important role to play here once they are functioning.

F. PVO and Donor Interventions in the Bakel Project Zone

PVOs have not been very active in the area with the exception of the French-based organizations which helped Soninké emigrants in France to start their perimeters in 1974. The only active PVO project now functioning in Bakel is run by Oxfam-England, the group that initially provided some early financing of the Soninké Federation project.

USAID has been the most active donor in the project zone with livestock, irrigated perimeters, and health projects. The Japanese have recently agreed to finance a cold storage warehouse in Bakel.

2.8.3. Kaédi Project Zone

A. Socio-Economic Profile of Kaédi Project Zone

The Kaédi project zone is located in Mauritania's Fourth Region (Gorgol) and covers the départements of Kaédi and Maghama. The rural population of the project zone is approximately 30,000. The project zone also includes the regional capital of Kaédi, which, with a population of over 20,000, makes it the largest urban center in the Senegal River Basin between Saint Louis and Kayes.

The Kaédi project zone spans the central, walo-rich portion of the Middle Valley where land tenure problems are the most acute. The area has a notable history. Its predominantly Tukulor populations were one of the first Black African ethnic groups to embrace Islam nearly a millenium ago. Today, Kaédi remains one of the most important centers of Koranic learning and the marabouts continue to exercise great influence on the local populations. The two main orders are the Qadiriyya and the Tijaniyya, the later introduced by Umar Tall in the mid-nineteenth century. Before the French colonial conquest, the area was often embroiled in wars with Moorish tribes from the North. The area came under French rule during the last two decades of the nineteenth century. It took longer to subdue the Moors in the north.

During the colonial period, political and economic activities in Mauritania revolved around the Senegal River. Saint Louis was the capital of both Senegal and Mauritania. In the early part of the period, trade along the Senegal River floruished. However, the establishment of the Dakar-Bamako railroad line and the shift of economic activities to the peanut zones in Senegal initiated a period of economic decline which has continued to today.

During the colonial period, there was little restriction of movement between the Tukulor populations on both sides of the Senegal River.

Thus, Tukulor families from Matam would send their children to Kaédi for Koranic and primary school education, and families from Kaédi would send their children to Saint Louis to attend French secondary schools. The absence of western schools for Moors to attend in the north meant that Black Africans from the Senegal River region tended to dominate th lower echelons of the colonial territorial bureaucracy in Mauritania.

Since independence, the political situation has changed considerably. The Moor majority took political power and placed more Moors in top administrative positions. Efforts to Arabize the Black African populations also aroused tensions between the two groups. During the late 1960s and 1970s, there were occasional clashes between Moor and Black African secondary school students in Kaédi over this issue.

By the end of the colonial period in Mauritania, the locus of economic power shifted to the north with the development of mining. After independence, the establishment of a new Mauritanian capital at Nouakchott, the expansion of mining and maritime fishing, and urbanization

provoked by drought and the collapse of the nomadic economy increased the economic gap between the Senegal River region and the modern monetized sectors of the economy. Outmigration from the Kaédi project zone increased tremendously as young men sought work in Nouadibou and Nouakchott. The great drought and massive outmigration transformed the Kaédi project zone from a net exporter of millet to a deficit area. This in turn created a favorable climate for the populations to be receptive to irrigated agricultural schemes.

The average per capita income for the Gorgol region according to the RAMS report is $ 391, a figure which approximates the national average. However, this figure is distorted by the presence of relatively large numbers of wage-earners, merchants, and civil servants working in the regional capital of Kaédi. The average per capita revenues derived from farming, animal husbandry, fishing, and handicrafts in the project zone is less than $ 45, a figure reflecting both the extreme poverty of the rural populations and the absence of cash crops and market opportunities. Only 11% of the region's per capita income is derived from agriculture and related activities ; 62% comes from service occupation income and 27% from remittances.

B. History of SONADER Interventions and Related Development Activities in Kaédi Project Zone

SONADER was created in July 1975 but did not begin operations until 1976. Irrigation activities in the Kaédi zone date back to 1967, when an irrigated perimeter was established in the village of Winding. Until SONADER entered the scene, Génie Rural constructed the perimeters and the Direction de l'Agriculture was responsible for supervising them. The Winding perimeter and several other small perimeters were financed by FED.

There are basically two kinds of irrigation schemes in the Kaédi project zone : (1) small village-level irrigated perimeters. In 1981 the zone had 16 perimeters covering a total 350 ha, with each perimeter ranging from 10 to 40 ha in size; and (2) the large pilot perimeter of Gorgol located at Kaédi.

The history of the Gorgol Pilot Perimeter provides many lessons as to what should be avoided in planning large perimeters. While sociological analyses were commissioned in 1972 and 1974 to guide the project, they provided very little hard socio-economic data and inaccurate conclusions concerning the willingness of the traditional landowners to accept the project. The Mauritanian administration had no clearcut land tenure policy and made little effort to explain the project and win the support of the local populations before construction work was begun in 1975. As a result, the traditional landowners systematicaly opposed the project, insisting upon their traditional rights to collect rent and other charges from those working on their land. They also demanded preferential access to perimeter plots for themselves and their families. Negotiations lasted two years before an agreement was signed in May 1977 on terms which were very advantageous to the traditional landowners. The owners yielded the land to the state for an undetermined period and were given clearly preferential treatment in the allocation of plots. The state also agreed to return the land to the original owners in case the project was terminated. The traditional landowners placed many of their dependents on

the perimeter and forced some to continue to pay them rents.

Since the agreement was signed, there have been constant conflicts. In 1979, the traditional notables organized a boycott and much of the perimeter went uncultivated, with the exception of plots cultivated by Soninké farmers. This increased tensions between the Tukulor and Soninké communities. The boycott was instituted to protest SONADER's decision to charge the plotholders for the costs of financing the coming agricultural year and for maintenance of the perimeter. The previous two years, plotholders did not have to pay. Since 1979, the state has toughened its stance towards the traditional landowners in Kaédi.

The USAID/OMVS IDP in Kaédi as elsewhere in the SRB, places great emphasis on the need for good sociological analysis and preliminary explanatory campaigns as prequisites for designing equitable projects and winning the support of the local populations. Some of the problems which led to delays in farming the Gorgol perimeter after it had already been constructed might have been avoided if such measures had been taken by the Mauritanian government. The IDP proposes to resolve outstanding land tenure issues and obtain popular support before perimeter construction or expansion is started.

SONADER has had fewer social problems on its small perimeters. As elsewhere in the Senegal River Basin, the small perimeters also have had higher yields - more than 4 tons of rice per hectare during the rainy season. During the contre-saison, many perimeters grow maize and vegetables. Small perimeter construction in the project zone has been financed by FED, FAC, and the World Bank. Farmers look to the small perimeters to provide food security ; they do not see small perimeters as important sources of cash income. In the past, family plots have been too small -- usually well under .5 hectares -- to produce much of a surplus for the market. However, there is a growing demand for expansion in villages which already have their perimeters and demands for new perimeters in villages which do not have them. A possible constraint to small perimeter expansion could be land tenure issues, since expansion will increasely move into Walo land.

SONADER is also responsible for marketing and processing rice produced on the perimeters. There is a rice mill in Kaédi which has an annual capacity of 5,000 tons. However, the project zone does not market sufficient rice to keep the mill running at anywhere near full capacity. Less than 2,000 tons of rice are now sold to SONADER for processing.

In 1980, CARITAS/Mauritania began an integrated development project at Paliba Pond in the Department of Maghama. The project plans to use water from the pond to cultivate 90 hectares of village rice paddies and for vegetable gardening. It also plans to stock the pond with fish and build fishponds not far from the irrigated fields. Since the IDP plans to introduce fishponds in its perimeters, IDP staff should follow the Paliba project quite closely.

C. Political Institutions

Mauritania is governed by a military regime which has banned political parties and public political activities since coming to power in 1978. The government is currently discussing means of giving the local populations some formal channels for expressing their views. At the beginning of 1982, some local leaders in Kaédi were planning to organize neighborhood committees to prepare for the time when local elections will take place. However, even if the Mauritanian regime should restore political parties, it will probably take several years before they could become a major force in the rural areas.

The absence of formal political elective bodies increases the relative influence of traditional notables, especially those who willingly collaborate with the regime. The Tukulor in the Kaédi project zone identify more with Black Africa and retain close ties with the Tukulor on the Senegalese side of the river. They are very much aware that the Senegalese side has better roads, schools, and medical facilities and more political freedom. There is growing dissatisfaction with the present situation and Tukulor nationalism is on the rise, abetted by groups like the Association pour la Renaissance du Pular which promote Pular as a national language.

D. Administrative Institutions

In Mauritania as in Mali and Senegal, the Governor is the dominant administrative official at the regional level. The IDP staff will have easy access to the Governor since Kaédi is the regional capital of the Fourth Region. The Governor is assisted by an economics officer who deals primarily with financial and economic development problems. In the past, SONADER has not worked closely with the Governor in discussing its irrigation program. While there is a regional budget, there is no regional plan. The involvement of the Governor in regional development planning depends largely upon the extent to which he is interested in such questions. There is no formal mechanism similar to the Regional Development Committee in Senegal which meets regularly to discuss regional development projects.

The Gorgol region has had a Regional council since 1980, consisting of 20 members designated by the Governor. The Regional Council deliberates on the Regional Budget, which in 1981 was approximately 520,000 dollars. The Regional Council members have no real power since they can be overruled by the Governor or the Ministry of the Interior. Most Regional Council members are notables chosen from the different departments in the region. In 1980, Kaédi received 150,000 dollars from a Regional Development Fund created by the government. The Regional Budget is used to provide some funding for rural development services, well construction, market infrastructure, and other small-scale projects.

The préfet is the main administrative officer at the departmental level. He often intervenes to resolve land tenure disputes among different villages. For example, in one village in the project zone, the préfet went against the wishes of one village and the technical advice of SONADER in placing a perimeter in an area which was not topographically suitable largely because of the préfet's desire to satisfy the demands of a neighboring village which did not want the perimeter to be constructed on what it considered to be part of its own land.

SONADER officials have gone to the préfet for help when farmers refuse to repay their debts to Sonader. In such instances, the gendarmes (rural police) are called in to put pressure on recalcitrant farmers to pay up.

In the project zone there are very few services located at the district level. Unlike Mali and Senegal, Mauritania doesnt divide its administrative units in Cartesian fashion. Thus, departments do not necessarily have several districts.

E. Technical Services in Project Zone : Linkages with Project

(1) Inspection Forestière.

The Regional Forestry Service is located at Kaédi. The forestry service staff is quite thin in the project zone. The cantonnement forestier (department level) at Kaédi has only three agents. Its most recent project is a modest Neem tree nursery started in September 1981. The department of Maghama also has a forestry post with 3 agents.

One percent of the regional budget is allocated to the operating budget of the regional forestry service -- less than $ 6,000. The service is almost entirely dependent upon external financing to carry out projects or to obtain new equipment. During the drought years (1973-78) USAID financed a firebreak project and provided 4 all-terrain vehicles and 2 graders, and a truck. This equipment was not replaced.

The Regional Forestry Service is under the Directorate of Environmental Protection in the Ministry of Rural Development. While agents are very much concerned with controlling tree cutting, stopping the advance of the desert, preventing bush fires, and preserving the classified forests in the zone, the Forestry Service does not have the personnel nor resources to carry out these missions. Firewood is becoming scarcer as forestry resources dwindle, and prices have nearly quadrupled in Kaédi in the past few years.

The USAID/OMVS IDP will be able to obtain some assistance from the Regional Forestry Service in the Kaédi project zone by getting its agents to participate in the field activities of the Mobile Training Unit. The forestry service no longer has responsibility for inland fishing, which was transferred to the Ministère de la Pêche which has no presence in the Gorgol region at this time.

(2) Service de l'Agriculture, Kaédi Sector.

The agricultural service in the Kaédi project zone is headed by a chef de secteur (sector chief). In the Kaédi region, the agricultural service is concerned primarily with extension work in vegetable farming. Before SONADER came into existence, it was responsible for irrigated agricultural activities. Since then, it has become the poor brother to SONADER. Most agricultural extension agents were trained in a three-year program at the National Agricultural Traning and Extension school (ENFVA) in Kaédi. The agricultural extension service has not made an effort to improve techniques on traditional Walo and Djeri lands.

There is not much collaboration between SONADER and the agricultural extension service. The latter has few resources and a limited budget.

(3) The Cooperative Service

Although each small village irrigated perimeter has a pre-coop (groupement), the cooperative service is not very active in the project zone. The cooperative service remains in an embryonic state. There are few Mauritanian cooperatives with full legal status. (See the Technical Analysis on Cooperative Development, Volume 3, Section 3.6.). The IDP will probably work with the handful of coop agents in the project zone in organizing new perimeters and improving management skills in existing ones. The assistance of these agents will be coordinated through the Mobile Training Unit.

(4) Functional Literacy Service

Mauritania has no formal functional literacy service. The Institut des Langues Nationales may be starting literacy programs in Pular in elementary schools in the Kaédi region in 1983. The IDP plans have the Institute help train Functional Literacy Agents (FLA) and organize a literacy program in the project zone. In the town of Kaédi, however, there are already people giving literacy courses in Pular. For example, one health official gives night courses for free on his own time. He uses materials produced in Senegal. Thus, there is a demand for learning how to read and write in Pular in Kaédi itself. It is of course much more difficult for government officials to organize courses in the villages on one's own time. The desire for literacy in Pular appear to be related to the resurgence of Tukulor nationalism.

(5) Inspection Régionale de la Jeunesse et des Sports

Since the military took over, the main emphasis on this service has been on sports activities. In Kaédi, the regional youth inspectorate has helped organize collective gardens in several villages. These projects work with youth associations and bring together young men and women. Parents have supported the projects because they bring in extra income and food. Unlike the Foyers in Senegal, which rely heavily on donor or PVO support, the youth garden projects rely primarily on money collected from villagers working in the town who send money to buy seed and agricultural implements. The youth associations use the money earned from selling potatoes and other vegetables to improve their village.

(6) Inspection Régionale de l'Elevage

The Livestock Service in Mauritania is primarily concerned with animal health issues. The veterinarian perspective dominates and there are few ties between livestock officials and other technical services. Like most rural development services in Mauritania, the livestock service is underfunded and often lacks the funding needed to carry out vaccination campaigns. The IDP staff should tap the knowledge of livestock officials and try and get them interested in project concerns about protecting herders' rights and regional issues such as regulating livestock movements across the Senegalese border and the need for regional

vaccination campaigns to prevent the spread of cattle disease.

The size of the cattle herds in the Fourth Region has not reached pre-drought levels. In 1968, there were approximately 300,000 cattle ; now there are 267,000. However, there has been a sharp increase in sheep, up to 560,000 from 300,000, and goats, now up to 550,000. The number of camels has also increased considerably, jumping from 8,000 in 1968 to 12,000. One livestock agent jokingly reported that Moor ministers and other important men are now investing heavily in camels rather than Swiss bank accounts.

(7) Commissariat pour l'Aide Alimentaire (CAA)

The CAA (Food Aid Commission) is a key institution in a country like Mauritania, which has to import 70% of its needs in cereals. In 1980, cereal food aid imports were 61,000 tons compared with a national production of only 41,000 tons. The ability of Mauritania to obtain massive food aid decreases the pressure on the government to promote agricultural production. Since 1969, the CAA has depended entirely upon foreign aid.

The CAA is organized at the regional and departmental levels and generally administered by Moors. The national CAA sends evaluation missions to make a census of food needs. In 1981, food aid needs for the Fourth region were estimated at 1,253 tons. This figure included 299 tons for Kaédi and 298 tons for Maghama. USAID is an important source of food aid in the fleuve region and provides millet and sorghum. The regional CAA agency manages and controls stocks. At the departmental level, the CAA maintains storage depots. The regional CAA agency in Kaédi works closely with the Office Mauritanien des Céréales (OMC), which stores and sells regional stocks of cereals at 13 UG per kilo in order to discourage speculation and keep down food prices.

(8) Research Institution Linkages

Mauritania's principal agricultural research center is located at Kaédi. The Centre National de Recherches Agronomiques et du Développement Agricole (CNRADA) has several specialized divisions : (1) rice culture ; (2) vegetable farming ; (3) fruit ; (4) food crops ; (5) cattle farming. It also has a crop protection and seed service. The CNRADA has been and will continue to be funded by the USAID/OMVS Agricultural Research Project (ARP), which is part of a broader program to improve agricultural research in the Senegal River Basin.

In the past, working relationships between the extension service and the research center have not been very close. However, CNRADA has recently signed a research/extension protocal agreement with SONADER, and both IDP and ARP will attempt to forge better linkages between the CNRADA, SONADER, and the other extension services operating in the project zone.

(9) Donor and PVO activities in the Kaédi Project Zone

There is relatively little PVO activity going on in the Kaédi area outside the Caritas/Mauritania integrated development project at Paliba pond, with the exception of the Catholic Relief Service collaboration with

USAID/Mauritania in running nutrition and child health programs.

FED has financed and provided technical assistance for the large-scale Gorgol Pilot project at Kaédi. This project has been plagued by numerous mishaps, the latest being the collapse of the major dike. FED also financed some of the early perimeters established in the project zone as did FAC and the World Bank.

The UNDP has provided some support for the agronomic research center and funded a seed center. FAC and the FAO have also provided some technical assistance to the research center.

Kaédi has the best social infrastructure of any Mauritanian town on the River. It has a modern hospital financed by FED and Saudi Arabia and one of the best lycées in the country staffed by French, Algerian, and Tunisian teachers.

So far, very little has been done to improve roads in the Kaédi project zone. Most donor effort has gone into the Kiffa-Nema road to the north. Roads are much better on the Senegal side of the River, and the IDP should attempt to win clearance to bring in equipment from Dakar or Saint Louis rather than from Nouakchott. There is a ferry linking Kaédi to Thilogne in Senegal. The road from the bac landing in Senegal to Thilogne should be improved and a larger ferry installed.

2.8.4. Gouraye Project Zone

A. Socio-Economic Profile of Gouraye Project Zone

The Gouraye project zone is located in Mauritania's Tenth Region (Guidimaka) in the southeastern corner of the country. The region's population in 1980 was estimated at 90,600 ; the rural population in the project zone is approximately 20,000. Sixty percent of the active population are women, a reflection of the large male outmigration from the region.

Selibaby, the only urban center in the region and the regional capital, has a population of between 6,000 and 7,000. Most of the Guidimaka's region's administrative and technical service offices are located there. Selibaby is also the departmental capital of the project zone which covers the arrondissements of Wompou, Gouraye, and Khabou. It should be remembered that the size of arrondissements and departments in Mauritania are generally smaller than those in Senegal and Mali.

The Gouraye project zone is predominantly Soninké in ethnic composition. It is part of a broader Soninké zone which encompasses part of Senegal and Mali. During the late nineteenth and early twentieth century, the decline of the slave trade, wars, and the French colonial conquest disrupted the area's economy. Bakel, on the other side of the Senegal River, became more important economically as a French military outpost and trading center. Very little economic development took place during the colonial period and little development has taken place since independence, despite the area's considerable agricultural potential in both dryland and irrigated agriculture. The limited economic development in the area is due to its poor road infrastructure, lack of integration into the national economy and benign neglect by the Mauritanian government.

According to the RAMS report, regional per capita income was approximately $ 214, little more than half that of the Gorgol region. The great contribution of emigrant workers is reflected in the fact that remittances account for 53% of per capita incomes, compared with only 21% derived from farming, animal husbandry, fishing, and handicraft activities. The RAMS study also notes that the Guidimaka region has a negative savings rate and a heavily indebted population. The IDP is thus dealing with an extremely poor rural population whose economic survival depends largely upon remittances coming from those working outside the region. The relatively small size of the male labor force due to outmigration also has important implications for the project.

B. History of SONADER Interventions and Related Development Activities in the Gouraye Project Zone.

Irrigated agriculture in the project zone began in 1975 with the construction of the Bedenky perimeter which was financed by FED and was part of the Opération des Petits Périmètres Irrigués (OPPI) then under the supervision of the Agriculture Service. SONADER did not enter the picture until 1978 when it set up two small perimeters at Toulel and Sagné.

In 1979, SONADER took over supervision of all the perimeters in the Gouraye zone, which at the time was an extension of SONADER's Kaédi sector. In 1980, Gouraye became an autonomous SONADER sector and small perimeter construction was increased. In 1981, USAID/Mauritania financed an 18 month program to assist SONADER in setting up new irrigated perimeters. The American-based PVO, AFRICARE, was given a contract to provide technical assistance to oversee the project. The project got off to a slow start because of administrative delays SONADER operations in the Gouraye project zone are not as well-equipped nor as well-staffed as in the Kaédi project zone. American Peace Corps Volunteers have worked closely with SONADER, serving as extension agents. There are now 12 PCV's working as SONADER extension agents in Mauritania, including three each in the Gouraye and Kaédi project zones.

Most of the 15 perimeters operating in the Gouraye zone were financed by the World Bank. The USAID/OMVS IDP will be working closely with the World Bank in constructing new perimeters and in rehabilitating and expanding existing ones. The World Bank will finance construction and the IDP will provide technical assistance, training and operating support.

Elsewhere in the region, USAID/Mauritania has funded an Integrated Rural Development Project in the Selibaby area. The project was primarily concerned with dryland farming and livestock interventions in villages near the regional capital. A 1980 project evaluation noted that the project suffered from attempting to do too many sub-tasks which stretched financial and managerial resources. The IDP should also be aware of this problem, especially in a region where one can not rely very much on Mauritanian technical services to provide support for woodlots, cooperative training, and other activities.

One of the most successful projects in the Guidimaka region is that run by the British based War on Want team which covers a dozen villages. Before lauching their project, War on Want did a careful in-depth socio-economic analysis of the area in which they wanted to work and engaged in long discussions with the local populations. War on Want stresses self-reliance as both a means and an end. It insists upon using low-cost equipment and the application of simple techniques which require a minimum of capital and technical assistance. The project is very well adapted to local conditions. The IDP team in the Gouraye area should profit from the War on Want experiment.

C. Political and Administrative Institutions

The Mauritanian regime regards the Guidimaka region as a distant province. Unlike Gorgol and the Kaédi project zone, it was not very well integrated into the French colonial administrative system. Political tensions are lower in Gouraye than in Kaédi where Tukuloi nationalism is on the rise. An important Soninké clan has close ties with the military regime in power while another important clan which used to have good ties with the ousted Daddah regime is now in eclipse.

As a distant province, the administrative apparatus is much thinner in the Tenth Region than elsewhere. This is particularly true of the Gouraye project zone where the main administrative presence is the Chef d'arrondissement.

One has to go up to Selibaby to come into contact with the préfet and the Governor. The tenth region has a modest Regional Budget which in 1980 was approximately $ 215,000. Gouraye's administrative and technical service infrastructure is practically non-existent. This means that the IDP will be creating a new administrative and technical infrastructure for the area.

D. Technical Services and Linkages with the Project

The offices of the regional technical services operating in the project zone are all located in Selibaby. SONADER is the main technical service operating in the Gouraye project zone. Poor roads and small operating budgets (the classic "manque de moyens" syndrome) means that technical services based in Selibaby are not very active in Gouraye. A good road between Selibaby and Gouraye would be a great help.

E. Donor and PVO Interventions

War on Want and AFRICARE are the two main PVO's operating in the region.

USAID is fairly active in the region, financing the AFRICARE project, the Guidimaka Integrated Rural Development Project, and a Rural Roads Project under which USAID will be collaborating with UNSO to construct the M'Bout-Selibaby road. The Chinese are building a hospital in Selibaby.

2.8.5. Kayes Project Zone

A. Socio-Economic Profile of Project Zone

The USAID/OMVS IDP is located in the First Region in western Mali. The First Region is Mali's second largest administrative region in size, with an area of 128,000 square miles and an estimated population of over 900,000.

The immediate production phase of the project is concentrated in the cercle of Kayes. It will directly involve 16 to 20 villages both upstream and downstream from Kayes, the regional capital and Mali's third largest city, with a population of nearly 40,000.

The Malian project zone resembles those of Bakel and Gouraye in several ways :

(1) rainfall is relatively high, averaging over 700 mm/year, and rainfed agriculture is likely to remain the predominant form of agriculture, even with the expansion of irrigation ;

(2) the rural areas in the zone are primarily subsistence economies producing for self-consumption ;

(3) the zone is only marginally integrated into the national economy and regional trade is the predominant form of economic exchange ;

(4) outmigration is very high and village living standards in the zone are to a large extent dependent upon remittances sent by emigrants working in France and other parts of Africa ;

(5) the Soninké are one of the most important ethnic groups in the zone ;

(6) the people in the zone were initially attracted to irrigation to complement and secure food production ;

(7) the high costs of inputs and relatively low producers' prices for cereals have been obstacles discouraging the expansion of irrigated perimeters.

The First Region is one of Mali's poorest and least developed regions. Per capita incomes in the Kayes region are lower than the national per capita income of $ 120, which is the lowest in the Sahel. The lack of transportation infrastructure outside the narrow confines of the Dakar-Bamako railroad line, the unsanitary health conditions throughout much of the region, and national marketing policies providing few incentives for farmers to increase production and all major obstacles to regional development.

In the future, the First Region's economic status may improve considerably following the completion of the Manantali dam in 1987 or 1988. The Malian government has begun to end its previous neglect of the region. The 1981-1985 Malian Plan calls for 16.8% of the Plan's total investments to go there, the highest percentage for any single Malian region. (This percentage

excludes investments for the Manantali dam). It should be noted that the Malian government is not making heavy investments in irrigated agriculture. Even under the most optimistic projections, the Malian government does not expect the First Region to account for more than 5-10% of the national output from irrigated agriculture. Its main efforts in irrigation have been concentrated along the Niger River (Office du Niger, Central Delta, Segou, and Mopti).

In modern times, the economic development of Kayes and its hinterlands was closely tied to events taking place within the French West African colonial system. The town of Kayes was originally a small Khassonké village before the French transformed it into a major outpost for the conquest of the French Soudan in 1882. Located near the Senegal border on the Senegal River, Kayes became an important port and supplier for other French colonial outpost in French Soudan. A railroad connecting Kayes to Bamako was completed in 1905. Though the railroad permitted the French to consolidate their hold over the French Soudan, it did little to promote economic development.

The completion of the Thiès-Kayes section of the Dakar-Niger railroad in 1923 linked Kayes directly to Dakar by rail and oriented the region's economy towards Senegal. With the completion of the railroad, the port of Kayes like the small trading ports all along the Senegal River declined in importance. River trade between Saint Louis and Kayes dropped sharply. Kayes, nowever, had the advantage of being a major railroad juncture. It became a major trans-shipping center for European imports shipped by rail to the French Soudan from Dakar. During the inter-war period, the Kayes region became integrated into the Senegalese colonial export economy by sending thousands of seasonal workers (navetanes)who worked as sharecroppers on Senegalese peanut farms. It also began to produce peanuts as a cash crop. Peanut production was concentrated along the railroad line, and the cercle of Kayes and became the most single peanut-growing cercle in French Soudan.

During the post-war period (1945-1960), peanut production became the most important cash crop in the region, generating 80% of the cash income derived from the primary sector. Production was concentrated in the cercles of Kayes and Keita. As peanut production expanded, there was a corresponding drop in food production in Kayes cercle. The Kayes hinterland was no longer able to produce sufficient food for Kayes, and the cercle became a net importer of rice and millet. During the post-war period, Kayes also became a major interterritorial cattle and livestock market drawing livestock from Southeastern Mauritania and Nioro for local consumption in Kayes and for export to Senegal by the railroad. Sub-regional trade facilitated by the fact that Senegal, French Soudan, and Mauritania had common currencies and tariff regulations, and open borders.

This situation changed radically after independence. The sudden breakup of the Mali Federation in August 1960 was accompanied by a rupture of trade relationships with Senegal and a rerouting of Malian and Kayes trade with Europe through the Ivory Coast. Peanut production dropped sharply in the cercle of Kayes as peanut producer prices dropped and the cost of evacuating the peanuts to export to Europe became prohibitive.

The Keita regime's (1960-68) socialist economic policies also contributed to Kaye's economic decline. The establishment of the Malian franc stifled legal trade with Senegal and Mauritania and led to smuggling. Because of the vastness of the borders, the Malian government's attempt to suppress smuggling did not work very well, as livestock and food crops passing through the first region were sold in Senegal and other nearby countries. Smuggling continued even after the Malian franc became linked to the CFA in 1967.

With the decline of the First Region's economy, emigration increased sharply. This in turn led to manpower shortages. Because of the labor shortages due to emigration, the decline in peanut production was not accompanied by a corresponding rise in food crops. As a result, food deficits increased. Peanut production in the cercle of Kayes never recovered to pre-independence levels. Efforts to revive the peanut economy during the 1970s were concentrated in the cercle of Keita under the auspices of the Opération Arachide et Cultures Vivrières (OACV). However, the Traoré regime maintained the previous regime's policy of maintaining low producer prices for food crops, a factor which discouraged agricultural development in general and encouraged the smuggling of food surpluses across the border to Senegal.

During the early 1970s, irrigation was introduced into the region on a small scale. Unlike the other IDP project zones in Senegal and Mauritania, irrigation production did not concentrate primarily on rice and other cereals. Instead, production was geared more towards vegetable production for marketing in Kayes. Vegetable production has leveled off in recent years as regional demand has become saturated.

B. History of OVSTOM interventions and Related Development Activities in Kayes Project Zone

The history of irrigated perimeters in the project zone dates back to 1971, when a pilot vegetable project was established at Kamenkole, a Khassonké village located 3 kilometers downstream from Kayes. The project was promoted by the Governor of the First Region, who wished to supply Kayes, the regional capital, with sufficient supplies of vegetables to meet local demand. The project received funds from the regional gov. and technical assistance from a French SATEC engineer. The perimeter had its own motorpump and was managed by the farmers themselves. The project was fairly successful and caught the attention of other villages in the area -- Sapou, Kakoulon, Maloum, and Bafoulabé -- which started their own small perimeters.

The 1974-1978 Malian National Plan, like most Sahelian plans responding to the aftermath of the drought, called for the development of irrigated agriculture to insure production independent of climatic conditions. The objective for the First Region was to rapidly eliminate its food deficits through a number of hydro-agricultural projects along the Senegal River and its tributaries, the Kolombiné and Térékolé. The Plan called for the creation of "Opération", the OVSTM (Opération Vallé du Sénégal-Magui) to develop and run such projects. In the Malian context, an Opération is similar to the Regional Development Agency (RDA) in Senegal in that it is generally concentrated in a particular area and

the mission of developing certain kinds of crops or agricultural activities. Thus, there is Opération Pêche in Mopti to develop fishing, Opération Riz-Ségou to develop rice, and Opération Arachides et Cultures Vivrières (OACV) in the First Region to develop peanut and millet production.

In Mali an "Action" operates on a smaller scale than an "Opération" which covers a wider area and entails far more resources. In 1975, the Ministry of Rural Development had established l'Action des Périmètres Irrigués (API) to promote the development of small village perimeters and expand extension activities in the areas upstream and downstream from Kayes. New perimeters were created at Fanguine, Djimekon, Moussa Gouya, Samankidi, Moussala, Gakoura, Sobocou, and Sangalou. Like SATEC in Senegal and SONADER in Mauritania, API was given formal responbility for controlling nearly all aspects of irrigation operations. Thus, API was supposed to provide extension services, improved seed, and agricultural equipment, distribute parcels to the villagers, organize the marketing of crops, collect fees and taxes related to irrigation, and help the farmers to establish structures which would permit them to manage their own affairs. API and the village producers' association signed a contract defining the mutual obligations of API and the villagers.

The creation of API in 1976 gave new life to the existing irrigated perimeters and permitted the construction of some new perimeters. FAC financed most of the perimeters ; others were financed by USAID, the World Bank, and European PVOs. For example, CIMADE, a French-based PVO, financed the irrigated perimeter which was established at Somankidi in 1977 across from Samé by former African emigrant workers repatriated from France. The 60-hectare perimeter was one of the largest in the Kayes area. During the early 1980s, another French PVO, the Groupe de Recherche et de Réalisation pour le Développement Rural dans le Tiers-Monde (G.R.D.R.), provide technical assistance to Malian migrant groups working in France seeking to begin development projects in their home villages in the Kayes region.

C. Political Institutions

Mali has a one party political system. The country held national legislative elections in June 1982. The First Region has several deputies representing constituencies in the region sitting in the Malian National Assembly. With the reactivation of political life at the local level in the coming years, these deputies will be advocates for economic and social development in the Region. The deputies should be informed about project activities in their districts.

The Malian regime has an ideology which calls for the renovation of village institutions -- the "tons" which are supposed to become the basic grassroots decision-making unit. At the present time, the political realities are such that most political activity and mobilization goes on in urban areas. The village "tons" are unlikely to be set up by the beginning of the project. In the one region of Mali where they already

function, the "tons" are integrated into a major cotton production scheme. Instead of "tons", IDP personnel will probably be working more closely with village notables and those involved in perimeter activities.

On the other hand, the arrondissement, cercle, and regional development committees called for in Mali's administrative reform should be just getting underway by the time the project begins. These elective institutions will give the local population formal channels for expressing their views about development activities taking place in their areas. IDP staff should be aware of these institutions, inform them of project activities, and enlist their support.

D. Administrative Institutions

Despite the revival of local political institutions, the territorial administration will still probably dominate local affairs for some years to come. While Mali was under military rule (1968-1978), the Governor was the dominant administrative official. In most cases, the Governor was a military man accustomed to giving orders. Military men still serve as Governor in most regions. It will take several years before the authoritarian style of the Governor gives way to one more readily responsive to local desires and initiatives. The IDP staff should try and convince the Governor of the importance of the project. Having the Governor behind the project will enhance the prestige of the project and possibly facilitate the resolution of administrative problems that might arise during the course of the project. The fact that the regional capital is at Kayes will give IDP staff easy access to the governor.

Since the project is concentrated in the cercle of Kayes, the IDP staff will be dealing with the commandant de cercle of Kayes. Like the Governor, the commandant is also based in Kayes. As Malian administration is oriented more and more towards development activities, the commandant will play an increasingly important role in this domain. The commandant generally plays an important role in resolving local land tenure conflicts.

In the arrondissement, the chef d'arrondissement in the Kayes project zone will not have as much power or initiative as the sous-préfet in Senegal. This may change over the years as the Malian administration moves towards greater decentralization. But for the time being, one can not expect very much initiative coming from the chef d'arrondissements in the project zones.

E. Technical Services in Project Zone : Linkages with Project

(1) Eaux et Forêts

The Regional Eaux et Forêts Service is located at Kayes and has 35 agents for the entire region. Although an excellent national service, Eaux et Forêts in the Kayes Region suffers from insufficient operating budgets which are translated into few vehicles which run and little gas to run them. The service is also top-heavy. The cantonnement of Kayes

for example, has 10 Supervisors and engineers but not field staff at the lower levels. The Kayes Regional Eaux et Forêts service depends upon externally financed projects for funding to conduct forestry projects. West Germany is currently funding an important reforestation project in the First Region.

At the present time, there are no fisheries projects in the First Region. However, the service is currently thinking about the need to regulate fishing in the Manantali Dam area once the dam is completed. The Selingué dam attracted large numbers of fishermen and Eaux et Forêts had to step in to curb overfishing of the increased fishing resources.

There should be little difficulty in collaborating with the regional Eaux et Forêts service in planning fishponds for the IDP perimeters. Eaux et Forêts has already worked with a USAID and Africare on a fishpond project in San. However, the Eaux et Forêts service, like most technical services in Mali, suffers from the failure of the Malian government (which is in dire financial straits), to provide funds for operating costs. In 1980, the government did, however, pledge to increase Eaux et Forêts funding considerably, probably because many foreign donors are willing to fund reforestation and other forestry related projects in Mali.

(2) Direction Nationale de l'Alphabétisation Fonctionnelle et de Linguistique Appliquée (DNAFLA)

The Functional Literacy Service is currently not operating in the Kayes cercle project zone. However, it has conducted successful literacy programs elsewhere in the First Region, notably in the cercle of Keita. These programs were launched in the late 1970s and have been hailed as model functional literacy programs (See, for example, Guy Belloncle's Jeunes Ruraux du Sahel : Une Expérience de Formation des Jeunes Alphabétisés au Mali). The World Bank representative in Bamako also expressed satisfaction with DNAFLA programs financed by the World Bank in the First Region. The DNAFLA team in Keita works closely with the OACV (Opération Arachide et Cultures Vivrières which has recently been renamed ODIPAK).

DNAFLA has a time-tested formula, excellent staff, and good working relationships between the central office in Bamako and its field staff. It is one of the most efficient services in Mali. During the course of the project, it will introduce functional literacy and post-literacy programs in all villages where there will be irrigated perimeters. DNAFLA will also provide some assistance in setting up women's literacy programs and in providing audio-visual materials.

(3) Regional Cooperative Service

The Regional Cooperative Service is based in Kayes. Under the Keita regime (1960-68), the cooperative movement was one of the pillars of Mali's agrarian socialist policies. Since the fall of Keita, the cooperative movement has atrophied. Most of the cooperative institutions formally in place in the Kayes region were established during the Keita regime. But for many years, the cooperative service has been starved for

funds. During the late 1970s, efforts were taken by the Malian government to revive the cooperative movement ; however, these efforts were largely concentrated in the northern region of Gao and Timbuktu. So far, not much has been done to revive the cooperative movement in the First Region despite the enthusiasm for cooperatives generated at the June 1981 national seminar.

The regional cooperative service has 73 agents in the First Region and 7 centres d'assistance cooperatives (CAC). Each arrondissement has coop agent (Agent technique de coopération or ATC) to promote the coop movement in his district.

The Groupements Ruraux (GR) and the Fédération des Groupements Ruraux (FGR) are pre-coop organizations with no legal autonomy and under the tutelage of the coop service. Multifunctional cooperatives with full legal status are rare. Three of the village perimeters in the project zone, however, have legal status.

The regional capital of Kayes has an important consumer's cooperative which has been functioning since 1963. There are also specialized cooperatives engaged in truck farming, construction, livestock, and fishing activities.

The regional cooperative service is currently seeking funding for several projects to :

(1) establish an agricultural cooperative at Sapou, one of the IDP villages ;

(2) reactivate a herders coop in Kayes, and ;

(3) provide supplies for four Fédérations de Groupements Ruraux (FGR's). At the present time, the FGRs are not economically viable.

The cooperative service sees itself as a key part of what it calls a "triple alliance" which brings together farmer organizations, Regional Development Agencies, and the cooperative service. The IDP staff will be collaborating with coop agents by including them in village orientation and training activities and in working out functional literacy components teaching coop management skills.

(4) Livestock Activities

As the IDP develops a long-term regional plan for the First Region, it will have to take into consideration livestock activities. Kayes used to be a major interritorial cattle market before independence. The northern part of the region is the main cattle area ; livestock from Southern Mauritania often cross the border to graze in Mali. Kayes now has its own slaughterhouse , and the government is increasing its efforts to organize herder's cooperatives in the region. Identification of the region's livestock resources, cattle movements between Mauritania and Mali, and strategies for developing the region's livestock resources will be important elements of the First Region Development Plan. At the local level, the IDP staff will take care to see that herders are dealt with equitably.

The Direction de l'Elevage and Regional Livestock Service are attached to the Ministry of Forestry, Fisheries, and Livestock. The newly organized ministry is a kind of super ministry for Environmental Affairs. It is very much concerned with conserving existing forestry, fishing, and grazing resources as it is with producing more products and promoting animal health.

(5) Research Institutions

The OMVS has a major research station at Samé. The IDP will establish a joint research extension program with the Samé research station, suggest research issues for Samé to work on, and use the results of Samé research station. The Samé station will also be encouraged to do more work in dryland agricultural research than it has in the past.

(6) Manantali Resettlement Program

The IDP will not be dealing directly with the resettlement of the 12,000 people that will be displaced by the construction of the Manantali dam.

A separate OMVS project for this is being designed and will be under the supervision of the USAID/Mali. Nevertheless, the IDP team, especially the sociologist, should follow development at Manantali quite closely, since these will have repercussion on long-term development planning for the First Region.

(7) PVO and Donor Activities

The First Region and the Kayes project zone have generally been neglected by donors in the past. Most donor money in the First Region during the next few years will go into construction of the Manantali dam, major improvements in the railroad and road infrastructure, and water resource development and livestock projects in the north.

On the other hand, PVOs and donors have been fairly active in providing modest financial support and technical assistance to small village perimeters in the project zone. CIMADE, SUCO, and the GRDR have been particularly active in supporting perimeters established by emigrant groups returning from France.

Poor sanitary conditions -- especially river blindness and an undeveloped infrastructure -- are major obstacles to regional development. They should be major areas of future donor efforts, especially with the prospects for increased problems due to water borne diseases resulting from the Manantali dam construction.

1064

PART IV

LAND TENURE AND IRRIGATED AGRICULTURE IN THE SENEGAL RIVER BASIN

2.9.1. INTRODUCTION

Land tenure can be defined as the system by which a community allocates various rights in land. It is a serious problem in the Senegal River Valley because several different communities, local and national, have different systems of rights allocation for the same land. Sometimes these are complementary, as when the herder grazes his cattle on the harvested fields, providing the farmer with milk and fertilizer.

Often the systems are, or can easily become, conflictual. For example, near Rosso, a group of former slaves set up an irrigation project on dry steppe land. They believed their tenure was secured by the work they put into developing the land and the government's grant of the land to them for that purpose. However, when harvest time came, the head of the local Moor community arrived to claim his half of the yield. His ancestors had conquered the area and he had papers from the colonial government to confirm his title.[1*] The local gadi (Islamic judge) ruled that the documented historic claims outweighed the more recent government grant.

The introduction of irrigation is making land tenure issues much more intense. Some communities that want to introduce irrigation cannot do so because they cannot resolve the legal status of the land and workers. Other communities have no land appropriate for irrigation and have no legal framework allowing the acquisition of land. Even where communities resolve initial acquisition and redistribution problems, the tiny plot size and insecure tenure in new irrigated perimeters need attention. Tenure will have to be secured legally, and plot size more varied, if irrigated agriculture in the Valley is to be viable over the long term.

Farmers are increasingly interested in adopting irrigation. With full water control and double cropping, it has been shown to raise the productivity of the best flood plain land an average of 18 times.[2] Only a small portion of the land in any area is irrigated. As the proportion of land under irrigation increases, and population growth creates more demand, land conflicts will intensify and equity questions become more urgent.

Three nations, Mauritania, Senegal, and Mali, border each other along the river, each with its own national legal framework and regional administrative authorities having roles in land decisions. Each also has a state chartered, or para-statal, Regional Development Association (RDA) dealing with the issue in different ways: SAED for Senegal, SONADER for Mauritania, and OVSTM for Mali. In addition, multiple donor agencies bring their own approaches. All are concerned that equity accompany development, and that local communities are for the most part still in the process of finding new economic roles for people of caste and slave origin. There is an element of land reform and redistribution in government sponsored irrigation projects .

How land tenure conflicts are resolved will also in the long term bear on how fully other goals of integrated rural development are met. It is, for example, at least theoretically possible to improve the productivity of the land throughout the River Valley without improving the well-being of the local population. This is because all three nations want the area to produce rice to satisfy urban demand and ease the balance of payments caused by massive rice imports. Some development advocates argue that large state farms with wage labor would be a more efficient way of producing rice than working with local communities. Senegal, under the legal umbrella of the

* All references are on page 135.

1964 Loi sur le domaine national (National Land Law), has given SAED title to all the land in the River Basin so that it is free to choose which land to keep in its own name and which to allocate to communities. SONADER and/or the government of Mauritania is considering a National Land Law to give it the same opportunity. Mali seems likewise to want to emulate the Senegal's National Land Law.

But the large-scale developments the land laws are designed to facilitate are generally considered undesirable by local communities, particularly those whose land is expropriated. Even those those men find much-needed work there are rarely happy with the large schemes. New income is generally inadequate for a full year's subsistence. Thus the plot is only one component in the year's economic endeavors. Farmers on the large schemes tend to view themselves as workers organizing to negotiate with management rather then as a community of independant farmers. They complain that the development corporations are unreliable, arbitrary and expensive. Participants have little stake in the project, except the opportunity to produce some rice for their own consumption. Not surprisingly, that is frequently all that they do. This has led most donors, and some officials of SAED and SONADER to focus on small village perimeters instead. The latter are generally viable for the farm family and local community, and can be economically self-sustaining. They rarely, however, generate a marketable surplus, and hence offer no role to the development corporation beyond construction and credit. Without a marketable surplus, the development corporation cannot ameliorate the rice imports problem or maintain its own cash flow. In fact, the small perimeters may merely spread the taste for rice than the River Valley, where millet has been the traditional staple. More secure tenure and larger plots in medium and large perimeters can contribute to the resolution of this dilemma, especially if the changes are accompanied by increased producer prices for grains.

Other goals of development in the area have been to maximize employment, given a labor surplus and labor exporting situation, and to raise incomes without exaggerating inequalities. These goals are not necessarily compatible; in fact they may be contradictory. In order to maximize employment, irrigated plots are distributed to all requesters, in tiny allocations. When this is overdone, the introduction of irrigation may reduce the income of those who lost landholdings without offering a viable living to the wider group of plot holders. They in turn, cannot make it economically viable for development corporations, or for the national economies.

In the present political and economic situation, the OMVS countries are choosing maximum participation in irrigation, and therefore being required to subsidize the development corporations as well as consumer prices of food stuffs. This is seen as the best short term approach, while the farmers are learning irrigation techniques and the corporations lack the capital and capacity to expand the area under irrigation fast enough to allow larger plots. But over the medium term, both donors and host country planners seem to agree on the need to make the development corporations and national agricultural economies economically viable. Land law and its application will be a key factor in this effort.

This paper explores traditional rules for allocating land rights in each of the major ethnic groups in the Valley, and the historic patterns of interaction between them. It is argued that while it is essential to take these into account, it is impossible to leave these patterns intact when the land usage is changed. Irrigation is highly capital intensive, and much more labor intensive than the traditional flood-recession agriculture.

The approaches already adopted to land tenure issues in various irrigation projects by SAED and SONADER are discussed. These RDA's have already taken numerous projects through the acquisition and initial distribution phases, so that they have considerable experience of the tenure issues in these periods. This report also discusses some long term land issues that are not yet perceived as problems by the RDA's. Timely attention to them may resolve what appear on the surface to be motivational and organizational problems. Optional alternative approaches are presented, together with an analysis of the economical and social consequences for intended beneficiaries. The report considers the relevance of all of these factors at the individual sites proposed by the governments of the OMVS countries for USAID intervention. It concludes with proposals for administrative coordination and monitoring, land registration procedures, training and further studies of plot size, water fees, land rights and policy.

2.9.2. LAND AND TERRITORY IN THE PIVER BASIN

As of July 1, 1981, 24,530 hectares have been developed for irrigation in Senegal ; 4,895 in Mauritania and 280 in Mali[3]. There are major irrigable zones to the River Valley, namely the Delta from Saint Louis to Dagana, and including the Rosso area of Mauritania ; the Middle Valley from Dagana to Maghama, including Matam, Kaedi, Boghe and Podor ; and the Upper Valley including the Mauritanian area of Gouraye, the Senegalese Bakel zone and all of the Malian portion of the river, from the confluence of the Falemé River to the dam site. Each of the zones has a different predominant ethnic group and different patterns of land distribution and use. (See maps at end).

In the Delta, the Wolof are the predominant ethnic group, with minority communities of Peul, Tukulor and Moors. Moors claim title to much of the land on the north bank. The Delta has traditionally been used primarily by pastoralists and for fishing, as most of the land is too saline for agriculture.

In the Middle Valley, the Tukulor predominate with minority communities of Moors on the north bank, Peul throughout, Wolof in the west and Soninké in the east. The Middle Valley has the widest area of flood plain, the richest walo lands, and the densest population. Rainfall is so erratic in this area that the dieri land above the flood plain only produces crops in some years, and much of the grazing land within reach of the river has been exhausted.

The Upper River area from Matam to the Kayes region of Mali is dominated by the Soninké, with minorities of Peul Tukulor, Moors and Bambara. This area receives more regular rainfall and has a smaller flood plain. The result is that both flood recession agriculture traditionally, and new irrigated perimeters, play a smaller role in the overall agricultural strategy of local population. It is also inaccessible by road during major portions of the year and of difficult access in any season. The cash economy has penetrated this area very little ; only the remittances from migrants working in France, Dakar, Gabon, Ivory Coast or other more developed areas allow families access to cash. An average of thirty percent of the active-aged men (15-64 years) in a village are absent and working elsewhere at any given time.[4] In some villages the rate reaches 70 %.

North of the river valley in Mauritania and south of it in Senegal are areas of dry steppe, called Sahel zone, which are suitable for rainfall agriculture in some years, and typically harbor a mixed population of herders and farmers. Increasingly, villages in this area are combining the two activities by setting camps around borehole wells rather than pursuing transhumance as in the past.

Two fairly large and several small lakes are also filled by the Senegal River flood, and traditionally offer great opportunity for flood recession agriculture. The large ones are Lac RKiz in Mauritania and the Lac de Guiers in Senegal. The latter has been dammed so that it is made into a reservoir during flood season, and provides urban water to Dakar as well as irrigation water to surrounding projects.

2.9.3. TYPES OF LAND

The most valuable land for flood recession agriculture is the walo land (also called hollaldē) which is flooded every year and therefore has its fertility restored with a new deposit of topsoil, humus, and moisture. Its composition is 60-70% fine clay.

This land is the core of the traditional economic system, being cultivated by over 75% of the families in the Middle Valley (where the flood-plain is widest), and 67% of the families in the entire valley*. All of those who cultivate have a use right, and a large proportion of the families are proprietors of at least some walo land. In addition, this walo land, through the aquatic plants which use to grow there during the flood, provided the major source of food for both fish and livestock in the valley. Since the drought and the failure of floods to return to normal levels, both fishing and livestock have suffered severe long term losses.

The steep bank immediately along the main channel for the river called falo land is also very valuable, as vegetable crops and souna (a variety of millet, in French petit mil) are grown there in the cool dry season at the end of the flood. The fondē lands, which are adjacent to, but slightly more elevated than the walo lands, are the third most valuable type. They flood only in high flood years, are typically 40-50% clay and slightly shallower in depth than the walo soil. Because these lands are of little use when they do not flood, land rights to fondē areas are less carefully defined and tenaciously guarded than for walo land. For this reason, and because their greater elevation permits more reliable drainage, they have been the preferred site for the first generation of irrigated perimeters in most villages.

The land above the river banks is called djeri (also spelled dyeri). When rainfall is adequate it is cultivated within walking distance of the village, that is approximately a 5 kilometer radius. Thedjeri 5 to 15 km from the village is used for grazing the village herds, anddjeri land beyond that point, if one zone does not meet the next villages, can be used by any herder. If there is no water supply on it, it will be used only as a transit zone.

* André Léricollais, "Activités Traditionnelles et insertion dans les casiers irrigués de la vallée du Sénégal," Dakar : ORSTOM, 1978.

See also the same " Peuplement et cultures de saison sèche dans la vallée du Sénégal". Maps and text. Paris : ORSTOM, 1980.

2.9.4. TRADITIONAL PRINCIPLES OF LAND TENURE

It is customary to treat principles of land tenure separately for each ethnic group. This seems to have been because the original anthropological studies on which the discussions are based were done on the village level, and the highest level of generalization which their authors were willing to risk was the ethnic group. However, certain similar principles are recognized across ethnic lines. There may be more variation from one community to the next within one ethnic group than there is between two villages of different ethnic groups. Variation depends more on local economic circumstances and on historic wars and patterns of dominance than on ethnically exclusive customs. They will therefore be treated here with less reference to ethnicity.

The land tenure system in the River Valley, indeed in Africa as a whole, is radically different from the western system of freehold tenure. Different people and groups hold separate rights to the same piece of land. The various kinds of rights which may be held in the same property include the rights of community heads and overlords; the rights of family heads in an agricultural community to be allocated land on which to build and to cultivate; their right to distribute fields within their families ; the rights to tree crops and to cutting wood for firewood charcoal, mineral rights, grazing rights; and the right to draw water. The heads of communities generally have the right to collect a title known as the zakat in Islamic law, corresponding to approximately1/10 of the harvest. Today this continues to be paid widely in the river valley. The descendents of a founding family or families typically have a usc of right by what is called the droit du feu, or right of those who cleared the land, and cannot lose it unless they neglect to pay the tithe. Superimposed on this tithe may be a second tithe claimed of jurisdiction over it from the King. In the Middle Valley, following a clerical revolution which took place there in the 1770s, much of the land was redistributed to the leading clerics, and their descendents have inherited it. It was customary for all traditional sovereigns to give domains as rewards to loyal supporters, part of which might be personal property to be farmed by family retainers, and part a territory on which the patron was entitled to collect the tithes from existing families. Any land that fell out of cultivation through the extinction or departure of an entire family reverted to the community head for distribution to other cultivators. Pastoral lands were held communally, although sometimes partitioned among ethnic wards of a village.

Traditionally, the rights of free members of a community to land were not to a specific parcel of land,but to a portion of land appropriate to his or her capacities and status within the community. The head of family organized the work on a common family field, and distributed individual plots to family members. On his death, the common fields passed to the next head of family, and the walo plots were divided among his male heirs. Women customarily were allocated land by their husband's family once they married, so it was not usually considered appropriate for them to inherit. Strict Islamic law, which decreed that the land should be divided in equal shares, one for each male heir, 1/2 for each female, was only rarely applied. The common family field once comprised the major portion of the family land among Wolof, Tukulor, and Soninkē families, for it was on this that the family food supply was grown. However, in areas where peanuts, grown on individual plots, have gradually eclipsed food crops, the family fields have become less and less important. In the Soninkē area, which has been least exposed to cash-cropping the common family of an extended family remains important. The extended family household has also remained large . Extended families average20 and frequently exceed 100 among the Soninkē up river, as against 6 for Wolof of the Delta, and 12 for Tukulor of the Middle Valley5. This is important because it means

Upper River families are accustomed to cooperative work in much larger groups on larger land areas. The coordination and discipline necessary for irrigated farming can fairly readily be built on that base.

The authorities having administrative responsibility for land at the village or higher level include, in Tukulor terminology (Moors and Soninkē having analogous roles) the following: *

The Master of the Land (Dyom Leydi), responsible for boundaries of fields and of the village territory, announcing dates on which livestock could move onto the walo, and dates of sowing ; title held by a single patrileanage, sometimes two, usually of Peul origin.

Village chief or ward chief, whose authority is over people rather than land, title inherited in a single patrilineage, usually Tukulor, often Torodo (clerical)

Ceddo (Sebbe), warrior noble family (in some places warrior-clerical families) entitled to collect the tithe.

Chief of the Fishermen, who usually live in a separate ward of village. He is responsible for fishing rights, fleet migrations and marketing organization.

Inalienability is a basic principle of the right to cultivate, and at each of several levels. An individual cannot be deprived of a field he has cultivated. If he is unable to cultivate it, his family cannot be deprived of it, but rather it is redistributed to another member of the family. If no family member is available or if the family owns more land than its members can cultivate, some of the land may be let to sharecroppers by the household head, who collects up to 50% of the crop. Should a family die out or otherwise forfeit its claim to land in the village, the land is still inalienable from the village. It reverts to the village head who redistributes it within the village. The same principle used to extend up to provincial lords and sovereigns of traditional states. It is on this basis that it is often said that all land traditionally belongs to the King. In fact, it was based on this precedent that Senegal argued the validity of its national land law giving the government control over allocation of all land within the country. It is worth noting, however, that the traditional principle of inalienability started from the bottom up, and no higher level was entitled to dispossess any lower level, unless by conquest. The Senegalese National Land Law, which allows the government to declare whole zones of the country "pioneer zones" and allocates them to development corporations, is closer to the concept of eminent domain or even to state socialism than it is to the traditional African concept of community property.

The landless were those who were not native or freeborn or adult or male. They depended upon the freeborn heads of household to give them land appropriate to their needs and status. Young men and younger brothers worked on the head of families , lands, sometimes well into middle age. Women were expected to work on their husband's and father's plots, and might also be given rice, indigo, or vegetable garden plots of their own by the latter. The artisan

* Jean Schmidts, address to the annual colloquium of the Section Senegalaise de l'Association des Historiens Africains, on the theme, "Histoire du Sénégal : Bilan et perspectives des recherches", 22 Mai, 1982.

castes lived primarily from their trades, but were sometimes allocated garden lors near their sections of the village. Slaves were required to work a fixed number of days, usually 3 or 4, on the master's flood-recession land. They were given land in the djeri, usually quite distant from the village, and titled it on their of days. The plots cultivated by a slave were inalienable during his lifetime if he cleared them and brought them under cultivation, but at his death they would revert to the master rather than the slave's descendants.

The rough correlation between traditional social status and rights to walo land is shown in the following table:

Disbribution of Fields, by Type of Tenure and Caste in a Tukulor Village[1]
(Percentage)

Caste Group	Renting	Use Right	Within Family	Personal Property	Total
Torodo (Cleric)	22.5	21.5	16.0	30.0	100.0
Ceddo (warrior noble)	29.0	37.5	12.5	21.0	100.0
Cubbalo (fishermen)	16.5	19.0	10.0	54.5	100.0
Artisans (Castes)	42.0	20.0	3.5	34.6	100.0
Slaves	78.0	12.5	2.0	7.5	100.0
All	37.0	21.0	11.0	31.0	100.0

Peul and Moorish herders did not traditionally cultivate land, but the Moors owned much cultivable land. They had haratin (serfs) who cultivated their family lands, usually as 50% sharecroppers. The Peul generally entered into a symbiotic relationship with sedentary farmers, in which they traded milk and grazing rights for grain. More recently, most Peul have become semi-sedentary and begun cultivating at least part of the year. However, fewer of them have access to walo lands, and many are forced to rely on rainfall crops.

Tree crops are very important in the local economy. Gum arabic, harvested in the cool dry season, and charcoal, produced all year long, provide at least as much income for some families as agriculture. Rights to tree products are carefully defined. Moors have generally been able to enforce an ethnic monopopy of both activities north of the river, but families of various ethnic groups participate south of the river.

Mineral rights customarily belonged to the sovereign in the old kingdoms. The same seems to be true for the modern nation states. In the precolonial period the same logic applied to treasures, shipwrecks, and any other unexpected find. Such finds were spoken of as the King's property, although in fact the finders were allowed to keep 1/3 and the local chief 1/3, and only the final 1/3 reached the King.

Grazing rights were in the past, and remain today, a mixed set of territorial and private rights. A single fraction of a pastoral confederation shared a given territory within which all members had the right to graze their animals. Only a member of that group could dig a well in that area.

1Source: 'Mission Socio-Economique dans la Vallée du Fleuve Sénégal (1951), La Moyenne Vallée du Sénégal". (Paris, Presses Universitaires de France, n.d.).

Private rights in water, however, allowed virtual private range management. Any man who had a well dug owned the well, and was entitled to control access of it by other people and animals. He was obliged to allow passing herds to water for one day at his well, but thereafter they had to move on. This allowed him to let his family herd grow in proportion to his family labor supply and availability of pastoral land around his water. One of the contributing factors in the pasture degredation which precededthe recent drought was the government's entry into the well digging business. At government wells there was no private property in water and no system existed to monitor animal to land ratios. In fact, it was logical for herders to use up the government well's pasture first, in order to preserve their own[6]. The farmland which could be irrigated with water from a Mauritanian well, and thus form an oasis, was also as private property. The cultivation was done by haratin. When an oasis was first being planted, the haratin man planted the date trees and established the plantation,farming wheat and other crops in among the palms, and could gain a type of title to the land in the sense that he could never be dispossessed of it during his lifetime. However he was obliged to pay at least 1/10 and often 1/2 of the crop to the master family, and at his death the land reverted to the master rather than to his own children[7].

The Peul pastoralists relied until the Second World War on short range transhumance within reach of the river valley itself. In the 1950s and 60s, when the government of Senegal began building borehole wells in the Ferlo, many Peul who had only seasonal rights in the valley, settled permanently around the borehole wells and found it possible to adopt mixed farming. In those new communities,frequently three different ethnic groups have settled: Wolof, Peul, and Moors, all of whom found an opportunity in the ferlo to gain more rights in land than they had enjoyed in their original areas. They have moved from original farming or livestock specialities towards a common mode of mixed farming. The zone closest to the village is reserved for farming and divided into ethnic areas. Communal pasture lands are in a zone 1-10 kilometers from the well and village, again partitioned according to ethnic group. Peul and Moor villages close the river valley are increasingly interested in starting their own small irrigated perimeters. Some have appropriate lands, many do not. Over the long term amethod needs to be found for negotiating land rights for them or finding opportunities to participate in larger perimeter in their own groupements.

2.9.5.NATIONAL LAND LAW

Laws concerning land tenure passed during the colonial period since independence have been superimposed on traditional communal tenure systems. They do not, however, always prevail in reality. In fact,even in modern development schemes ostensibly operating according to new legal contracts, old systems of justice are often found to prevail underneath or alongside the new. Nevertheless, the national legal framework is an important overall consideration as development proceeds.

Senegal, Mauritania and Mali all inherited a colonial land law and administration system. Mali still used the 1937 text as its basic law (see Appendix). Mauritania passed a national land law at independence in 1960, whose concepts and application are very similar to those in Mali. (see text of law in appendix). In each case there are four different types of land use presumed to exist and legally recognized ; traditional farm and pasture lands, on which the customary law of the area is recognized ; vacant land, which belongs to the State and can be appropriated for development projects ; concessions rurales , farm or truck gardening lands usually in peri-urban areas; registered, homesteaded (mise en valeur), eventually provided

with saleable title , if all conditions are met; and concessions urbaines, similarly able to be titled if developed. The major problems of application in both countries have involved the concept of vacant land, of which on closer examination there is virtually none in cultivated areas such as river basin (even a 1935 investigation reported the same).* There have also been conflicts over the application of customary laws, which in fact are overlapping and conflicting systems particular to each community, and confused by a partial and irregular application of Islamic law. Finally, there have been conflicts between villagers and urban dwellers over titled concessions rurales et urbaines, which villagers perceive as being accessible mainly to city residents.

In Senegal, the 1964 Law on National Domain established the government as the ultimate proprietor of all nondeeded land in Senegal. Since property deeds were rare in Senegal except on the Cape Verde peninsula and in other urban areas, owners with permanent buildings on their land were allowed 6 months in which to establish deeds for their plots. Rural people, including those of the river basin, were generally unaware of this, and were not notified to present claims. Then all non deeded lands became part of the National Domain and could thenceforth be deeded only in the State's name. The National Domain, constituting all but 500,000 of Senegal's 8 million hectares, was then divided into four categories : 1. urban areas, 2. reserves (national forests and parks), 3. rural fann land and pastures (zone des terroirs) and 4. pioneer zones. Any area declared by the government a pioneer zone could be ceded to an organization willing to develop it. On this basis, first the Delta, and later the entire Senegalese portion of the Senegal River Basin was allocated to SAED for development. This made SAED the arbiter of land distribution as far as the national legal structure was concerned. The national land law also tried to eliminate the condition of landlessness in the zone des terroirs (farmland) by forbidding payments of rents, tithes and labor obligations and introducing the principle that the land should belong to the person who cultivated it for two successive years.

The law has actually been promulgated only very slowly. It took effect initially in Cape Verde, and then gradually through each of the peanut basin provinces, with very mixed results.Traditional land owners used a variety of devices to prevent non-owners from claiming land, including seeding more land than they could harvest, refusing to lend land in the traditional client system, and shifting to wage labor. In 1978 the law began to be applied in Casamance and only in 1980 was it introduced into the Senegal River Basin.

Where the National Land Law is promulgated, it is introduced simultaneously with an administrative reform which required local communities to reorganize themselves into officially recognized communautés rurales with officially prescribed local government structures. According to the law, conseils ruraux are elected , but the village chiefs are not eligible for residency, nor can more than one member of a family, nor any salaried or urban employee be a member. Ultimate control over land distribution and reallocation in the event of death or extinction of the lineage is shifted from the traditional authorities to the conseil rural. Thus, in theory, currently in the river valley, any of the lands can be appropriated by SAED for development, and those lands which are not expropriated are subject to the administrative reform and the National Land Law.

The competency of the conseils ruraux includes the following relevant functions .*

* See discussion by Sidy Mohamed SECK, "Les structures Foncières et Sociales et leur évolution dans la réalisation des aménagements hydroagricoles et le développement de la culture irriguée dans le bassin du Fleuve Sénégal', Consultant report for the OMVS, December 1981, p. 35

- regulating exercise of use rights to land within its territory, except for hunting, fishing, commercial forestry, and mining rights;

- distributing and expropriating (for defined reasons of public interest and with procedures for compensation for improvements) National Domain lands within its territory;

- local projects, and community participation in such projects;

- projects involving communal labor.

The conseils ruraux also have an advisory function, exercised on their initiative or when an outside agency wishes to initiate development project(s) in their territory. The council is to consider :

- the overall plan of land use in relation to soil and agricultural suitability, and crop rotation

- sowing, harvesting and gathering calenders

The conseil's deliberations are passed on to the Sous-Préfet, who prepares the necessary decrees (arrêtés), and transmits them to higher authorities. If not countermanded by the latter, they become effective 3 months after transmittal.

Only in the Delta area has Senegal actually expropriated land under the pioneer zone concept for state or private corporate ownership. The first large perimeter established in this fashion was at Richard Toll, where an experimental perimeter of 120 hectares started by the colonial government in 1946 was expanded in the 1950s to 1500 hectares and then to 6000. Using wage labor, it proved impossible to maintain the standard of cooperation, motivation and maintenance necessary to make rice cultivation sucessful. In 1971, the Government of the Republic of Senegal converted it to a sugar plantation an entrusted it to the Compagnie Sucrière Sénégalaise (Senegalese Sugar Co.), a parastatal corporation. Beginning in 1956, 400 hectares lying west of the state farm were equipped for irrigation and allocated to a small farmers' rice growing project. Most of its farmers were workers on the state farm. Since 1972, another 200 hectares have been opened up and the farmers' perimeter continues to grow rice rather than sugar. This year the government expropriated the walo and fondé lands of the 8 left bank villages between Richard Toll and Dagana, adding them to CSS's domain without regard to traditional use and ownership rights. Similar expropriation took place for a private Swiss livestock operation near MBagne.

SAED tried a number of other schemes in the Delta using labor recruited fairly widely within the Republic and resettled in the Delta area on rather uncertain tenure. The right to continue farming depended on satisfying SAED's rules and fees, and was strictly a usage right conveying no future security or transferability.

While the difficulties of the Delta schemes were multiple and largely technical, SAED also found a relationship between low motivation, insecure tenancy, and low productivity. It began to rely more on work with established communities in small perimeters in the Middle Valley area. Even in the brief time before the conversion to sugar when the Senegalese state farm at Richard Toll produced a marketable surplus of rice, the price of that rice was so high that it was exported rather than going to satisfy the local Senegalese market.

These experiences of SAED have already led it to modify its approach to try to build on local community organization rather than impose a totally new system. The new approach, however, is only beginning to be applied, and the practical applications are still not worked out. In particular, it has not developed a system of defining and documenting land rights to irrigated plots and administrative relationships of groupements de producteurs and conseils ruraux.

These problems should cause SONADER and OVSTM to re-examine the hypothesis that state farms are a solution to the rice production problem, and its corollary that a national land law will give it the legal power it needs. It at least suggests that a national land law is no panacea. Passing a law in the capital does not prevent local landlords from pressing their claims to land, or from attempting to block development. If the state does expropriate land, compensation may be essential to securing local cooperation. And where workers on state farms have no local community structure, nor any vested interest in the land, it has been difficult to make them economically viable. The OMVS Socio-economic Study reports, for example, of Richard Toll, Senegal, that "the overall scheme, which at the outset was a remarkable technical achievement, could not be maintained as it should have been. The standard of water control declined, and growing difficulties of organization and management hindered efficient operation of the scheme and brought about a progressive fall in output"[8]. Declining standards of water control, inadequate leveling and poor maintenance are the visible evidence of what economists measure as negative investment, that is, allowing the initial capital investment to devaluate. It has been found worldwide wherever plots are so small that there is no marketable surplus, and tenure so insecure that there is little vested interest.[9]

Yields are also consistently higher on small-owned perimeters than on state farms. While the quality of the yield data in the Senegal River Basin is still highly questionable, it is important that all of the data which does exist points in the same direction, including both observations of managers working in the area and official yield statistics. These show for instance that the settler-controlled land in the Richard Toll area showed yields of 3.6 to 5.5 tons per hectare, while the state-owned land farmed by many of the same cultivators only once reached a maxiumum average yield of 3.5 tons per hectare and usually hovered substantially below that. Similarly in the Mauritanian scheme at Gorgol, in the one year in which land disputes did not prevent cultivation of the entire area, (1978) the average for the whole scheme was about 4.5 tons per hectare. But that average resulted from significant internal variation. State-managed lands in that scheme averaged 3.4 tons per hectare while peasant farm lands reached peak yields of 6 tons per hectare on their third of the area.[10] Furthermore, even on the state-held lands in that project the rice grown was locally consumed by the cultivators, so that nothing was contributed to the solution of the urban rice consumption problems.

2.9.6. WHEN IRRIGATION IS INTRODUCED IN A COMMUNITY : LAND ISSUES IN THE DIFFERENT PHASES OF DEVELOPMENT.

2.9.6.1. Choice of land.

When owners initiate development, who owns what land is usually the first consideration in site selection. This has generally been the case in small village perimeters in the Senegal River Valley, which partially accounts for the relatively few problems of land tenure associated with getting them started. Villages have generally selected the less valuable fondé land, perhaps partially to avoid local conflicts over valuable walo land. The only remaining obstacle is whether or not they will agree to government imposed rules of equity for the distribution of the plots. Government agencies insist that former owners are entitled to no more shares than the number of active adults they can present. Villagers have generally agreed to this, and been

willing to distribute land to all who are willing to farm it. However, government supervision of equity is practically nonexistent. And some residual ownership seems to have been retained by former owners. Government technicians in the area believe that, although it is illegal, traditional shares of the harvest in recognition of ownership rights continue to be paid. The plots are too small (10 to 20 acres) to make the traditional system of 'rempetien' (50% share-cropping) feasible, and the recognition that it is unjust seems to be spreading, at least among cultivators. However, formerly landless farmers are in some areas paying a tithe, or at least a token bag of rice.

Even where a local community can agree on the selection and distribution of land for irrigation, an injustice is done to some members of the community and particularly herdsmen from neighboring communities who formerly used the land seasonally. Since herders are not thought of as members of the local agricultural community, and in fact usually live in their own villages some distance away, they are not normally allocated rights in the new perimeters created by agricultural villages.

Some perimeters have been created exclusively for herders, one in Mauritania and several in the Senegalese Delta. Their participants are reportedly more enthusiastic about irrigation than rainfall agriculture. Segregated herders' projects, however, are not likely to be a long-term solution. Herders do not own enough suitable land, and, due to poor communications development, personnel tend too often to pass them over. It has been suggested that herders might be able to be integrated into irrigation projects of agricultural villages if they were allocated the plots on the very circumference of the scheme so that they might be closest to their animals in the djeri land.[11] They also are helped by watering points for their animals on the far side of the perimeter from the river and these should be built into perimeter design whenever feasible. Yet some technicians have emphasized the difficulties of integrating herders. First of all, they are not thought of as belonging to the community. Secondly, they would want to grow forage crops, which would pose a problem for those perimeters growing rice. And finally, they are not accustomed to the discipline required for rice cultivation and tend to neglect their fields in favor of their herds. Yet as more and more land is diked and brought under irrigation, it becomes imperative to stop implicitly saying, "let them go elsewhere."

2.9.6.2. When Development Corporations Initiate Irrigation, Approaches to the Community.

RDA's tend to choose the sites on which they wish to begin irrigation projects by technical and economic criteria rather than by questions of local initiative and ownership. Considerations have included the availability of sizeable areas of suitable land (good soil, adequate fertility, elevation sufficient to be adequately protected from flooding and yet low enough to minimize pumping costs), and road access to facilitate management and eventual marketing. Early projects on both the Mauritanian and Senegalese side of the river, by predecessors of SONADER and SAED, proceeded with the technical aspects of development without adequately involving communities in the resolution of equity and management problems.[12] Construction was largely mechanized and compensation was offered former users neither for the loss of use during construction nor for ultimate loss of ownership. Both RDA's found that such an approach produced chronic conflict both within local communities and between neighboring communities.

SONADER has since resolved on a uniform approach. It still selects sites primarily on technical criteria. It then approaches the community,

through an agent, preferably a middle-aged man, who serves as community liaison or organizer. (In practice, SONADER does not have such personnel in adequate numbers. Much community work is done by managers who are young and some of whom are expatriates.) Members of the community are asked to bring forward any claims that they might have for land to be set aside fon irrigation. They are allowed one year in which to register all the claims. They are also required to form themselves into a cooperative capable of signing a contract with SONADER. The construction of the dikes and the primary and secondary canals is undertaken by SONADER at its expense if the community is able to organize to construct tiertiary canals, level plots, and reimburse for pumps. When all of the claims have been registered, the claimants are asked to renounce their ownership in exchange for participation under the following conditions : Proprietors have first priority in the distribution of the new land. They receive up to 1/3 of the amount of land they formerly claimed, providing they are able to produce one active family member or worker for each 0.5 hectares to be worked. Another third of the property is to be distributed to former landless farmers also on the basis of 0.5 hectares per active adult in the family. The remaining third of the land would be held by the state. Participants are compensated for their labor during the years of construction, and proprietors for the loss of use of the land during those same years. If the proprietors cannot agree to accept the conditions, or if a community is unable to form a cooperative capable of signing the contract, SONADER does not undertake the development. This approach has been presented as an interim solution by SONADER to the cultivators in the Gorgol scheme and future cultivators in the Boghé project. Final solution awaits the decision by the government on a national land law, and on the specific claims in the Gorgol and other newer areas.

Officials in the Ministry of Rural Development and at SONADER headquarters insist that the government cannot afford to compensate proprietors for land expropriated for irrigation, except in the form of allowing participation on the new high yielding land. They hope for a new land law to give them the legal arm to undertake both state development and distribution of land to landless families. However, the interim solution has some advantages. Currently SONADER does not have to investigate the validity of the various claims put forward, but can honor them all. In addition, it tries to persuade the community that the development is ultimately for its own benefit, and individuals must be willing to sacrifice their personal speculative opportunities for the common good. Insisting on precise legal rights can produce crippling delays and disputes. Some SONADER field workers, however, are wondering whether eventually some form of compensation might not be the best, because at present former owners persist in their claims. At Gorgol the owners gradually expended their alloted 1/3 of the land to over half, through control of the lists of participants.

SAED in Senegal has also modified its approach. After the negative experiences of fluctuating participation and insecure tenure on the big early delta perimeters, when in the late 1970s it moved to the small perimeters in the middle and upper river area, it left land appropriation and redistribution to villagers. The latter, as well as the SAED personnel in the area, agree in reporting that the land under irrigation belongs to the groupements de producteurs currently farming it, not to SAED.

On the large perimeters it has also modified its approach, although the new system of land rights is far from clear. SAED still claims title to the land in the large perimeters, and proposes to expatriate land for new large perimeters by legal fiat without compensation to owners. On the other hand, the groupements de producteurs to whom land is attributed are allowed to

form according to their own affinities rather than an imposed format. They are considered to have a stable use right to the land they farm, so long as they reimburse input loans and pay pumping and amortization assessments.

OVSTM has not had enough experience organizing perimeters for its approach to have been systematized. The perimeters in the Kayes region were mostly organized by Operation Perimetres Irrigués, a predecessor to OVSTM. Some land has been expropriated using the vacant lands concept and under the authority of the Prefet, to be ceded in turn to migrants cooperatives. In Bafoulabe and Sabokou this has led to chronic and once severe conflict with neighboring villagers who claimed the land (8 died in a 1981 conflict over the Sabokou perimeter). Once the land is under irrigation, there is a consensus that it belongs to the cooperative that is farming it.

2.9.6.3. Allocation and Cultivation in Existing Perimeters.

The allocation rules adopted by SAED and SONADER aim at the widest possible community participation, and at greater equity than the old system of ownership. In general they succeed during the first few years. Whether or not they will succeed over the long term remains to be seen.

The criteria according to which plots are generally allocated by both SONADER and SAED in the River Valley are similar, yet the results differ fairly substantially. There has been a rule, as there was in most traditional systems, that the amount of land received should be related to the number of active persons available. Yet in some perimeters one plot is allocated per family head regardless of family size. There has been a preference for direct personal exploitation of the plot by the members of the cooperative to whom it is allocated. Development corporations have insisted that plots be allocated to formerly servile and casted families directly, rather than through their patron families, as would have happened in the past. This has been enforced on the large schemes and seems to have been accepted on many of the smaller schemes, even where enforcement is not possible. The amount of land per active adult has varied from a minimum of 10-25 acres (0.1 -0.25 ha) in the small perimeters and the early large ones (e.g. Mpourie) to 0.5 hectare per active adult in the new larger Mauritanian schemes. The land is normally attributed to the adult male head of household, although in some schemes widows and absent migrants represented by their kin may also be members. The majority of heads of household received only 1 plot. The maximum on state schemes seems to be approximately 5 hectares or 10 plots to a single family. Two such families exist at Gorgol. A slightly larger number of cooperative members have up to 2 hectares apiece and the majority have a single 0.5 hectare plot[13].

Women have largely been excluded from the new benefits of irrigation. A few small perimeters have been created exclusively for women, and on the Senegalese side women have been allowed to form their own groupements de producteurs (Cooperative Work Groups) on large schemes. In such cases, the women usually are expected and expect, themselves, to raise traditional women's crops such as vegetables or indigo, rather than "men's crops" such as maïze and rice. This accords with tradition in the Tukulor area, where women have not generally been expected to farm grain except as they help their husbands. In the Soninkĕ and Mandingo areas, however, rice was traditionally among the women's crops, and it is only the introduction of new high-yielding and labor-intensive techniques that have led it to be considered a men's crop.

When one comes to the question of who actually farms rather than who is allocated a plot, the questions of equity become more complex. Throughout the river valley it has rarely been the tradition for land owners to farm their own land. Nobles customarily governed, managed, studied religion and supervised. Despite the rule that the recipients of plots should farm them directly, the same tradition seems to be extending itself to the new irrigation schemes. It was found , for example, that at the USAID sponsored scheme in Bakel, some 30% of the plots were being farmed by someone other than the person registered.[14] At Gorgol, 41% of the registered plot-holders were salaried workers, officials, or merchants, 12% were marabout, and only 45% were primarily agriculturalists. The marabouts send their disciples to work in the fields ; some supervise them and some do not. Salaried workers and other monied groups may work their own fields some of the time, but will supplement with wage labor and other family members' help in peak season. Even among the 45% who were primarily agriculturalists, traditional labor obligations are drawn upon. A similar pattern emerged for the one women's groupement on which there is data. That is, the vast majority of the women members used paid labor in addition to their own. Who are the paid laborers ? Some are herders destituted by the drought, some are landless refugees from Mauritania and Mali who have not yet assimilated into the community and some are school children earning pocket money. But no thorough study has been done.

These data point to the difficulty of controlling transfer of land, tenure systems, and share cropping. They do not however represent any serious deviation from the principles of equity laid down. On the contrary, participation in irrigation is at present far more widespread and equitable than distribution of any other resource in the local community. In fact, one of the constraints on greater equity is the fact that general participation has made the average plot size small. This means that irrigation is only a small part of each household economy, that every family is necessarily preoccupied with other economic activities, and that its full efforts are not devoted to irrigation. This is why, for example, landowners were able to persuade landless groups to join the 1979 boycott at Gorgol, by threatening to deny them access to walo lands on which they usually grow millet for food. Nevertheless, an unpublished ORSTOM investigation of the labor-effects of the introduction of irrigation discovered that formerly landless families who were alloted irrigated plots spend more time on their own irrigated plots, and tend to skimp now on the time they in theory owe their former masters on walo*. Thus while there is not strict adherence to the rule of one person one plot, the introduction of irrigation has thus far been an equalizing factor. There was very little direct personal cultivation of land by landowners in the former system ; in the modern irrigated perimeters there seems to be at least some. The cases of multiple plots assigned to a single family include not only former landowners, who are thus compensated for the loss of their land, but also large and unusually enterprising families who acquire more land because of their greater interest in farming. And the decision in some projects to allow migrants who are away in France or in cities to be allocated a plot should not be likened to classic absenteeism. It can also be a bridge to allow families to survive in a destitute area characterized by high rates of out migration, and eventually to offer an opportunity to migrants who wish to return.

* Jean Yves Weigel, "Mode de migration et système de production soninké," (Unpub. thesis, IIIe Cycle, Paris I, 1979).

Thus irrigation overall seems to be making the land more productive, and allowing a wider range of families to benefit from that productivity. The limitations on its ability to offer opportunity to former landless families comes from the small size of the plots and the uncertainty of tenure in the new projects rather than from the current minor inequities. Because neither Senegal since 1905 nor Mauritania since 1960 offered any compensation to former master families for the loss of their servile clients, the announced ending of inherited servile obligations has had only a slow impact in Senegal and very limited impact in Mauritania. Until recently, emigration was the main means by which members of servile groups could make their liberation meaningful. The irrigation projects have been the first practical step offering an alternative to such families locally in the river valley. Landowners have refused to work side by side with their former clients in the Gorgol perimeter, for example, but after several years of firmness on the part of SONADER and some geographic separation of the plots, the principle seems to be on its way to acceptance. Plots will have to be large enough to produce a marketable surplus before they can offer viable economic liberation. More serious over the long term is the fact that the combination of local custom and development corporation approaches have thus far left herders and women aside in this new development. It is in accord with local custom to consult only the male heads of sedentary households when organizing a new scheme. But the long term effect is to leave both women and herders out of the cash economy, as it is now being introduced. Thus the old rules perpetrate new inequalities.

2.9.6.4. Transfer of Plots

In theory, plot holders in irrigation schemes generally have only a non-transferrable usage right to their plots. On some early schemes, plots were re-allocated every year. This was universally found to produce poor leveling and maintenance, and to introduce an undesirable lack of continuity. On most schemes a farmer who enrolls year after year is allowed to continue on the same plot. However if he is absent, dies, or takes up another activity, the plot is supposed to revert to the development corporation or cooperative for redistribution. In fact, the statistics showing that anywhere from 30% to 60% of the cultivators are not in fact cultivating their own plot, suggest that farmers have found ways to transfer the plots without allowing them to revert to the cooperative or development corporation. A reasonable system of legal possibilities of transfer would probably be more stable and economically viable than the current system of insecure tenure and hidden transfers.

Inheritance, for example, was a well established principle for traditional usage rights to land. Thus it is very likely that local communities will work out a system allowing inheritance of use rights to irrigated plots, whether the development corporations permit it or not. For example, a family in which three sons succeed a father who dies will normally choose one son to succeed as head of the family. According to Islamic law, the land should be divided equally among the three sons unless it has been declared habous (an indivisible religious estate). If the three sons have been cultivating the land along with their father in previous years, the tendency would be for the cooperative to allow them continue to cultivate the land. The development corporation has little means of knowing whether they divide the land into three plots cultivated side by side or farm it as common family farm. Yet, as their families mature and in turn inherit the land, it becomes very important whether the land is being divided into ever smaller and less viable plots or continuing in the original minimum sizes. The possibility of inheriting the land also gives the family a vested interest in maintaining its fertility and viability. It can be an incentive for teenage sons to stay or return and farm rather than trying their luck in the city.

Yet inheritance is not officially permitted in either Senegal's or Mauritania's irrigated perimeters. The factors weighing against allowing iheritance of irrigation plots seem to be that it opens the way for two undesirable alternatives the development of an hereditary elite, or to fragmentation of the land. Yet if forbidding inheritance merely leads to camouflage, it might be better to recognize and regulate it. It would be helpful for policy makers in the development corporations to study ways in which these undesirable effects have been avoided elsewhere. For example, the possibility of declaring land habous in Islam can prevent its fragmentation. Similarly the traditional common family or clan lands were indivisible, so people are familiar with this principle.

In other areas where irrigation and cash cropping have been introduced simultaneously, allowing local communities to levy an inheritance tax and/or an annual land tax on developed land can both encourage farmers to keep it directly productive and discourage absentee landlordism. Taxation also can give local communities some budget with which to develop their community facilities. At present Mauritania has no tax on land except urban real estate. It formerly had an annual tax on herds and a per-person tax, but neither of those has been collected since the worst year of the drought, 1973. Senegal still assesses a variety of local taxes, and in accord with the administrative reform passed in 1973, is beginning to allow local communities to keep the tax revenues they collect. Since the drought, however, taxes have been forgiven in many years in many localities, on an ad hoc basis. Now when they are not forgiven, communities tend to resent it, and when they are forgiven, communities have no revenues with which to undertake local projects. The pumping and amortization assessments or irrigable lands amount to a local tax, and it is important that they continue to be collected whether or not the land is planted/harvested, to keep land in production.

Other kinds of prohibited land transfer are also taking place, but because they are outside the law it is very difficult to know exactly under what conditions. Some forms of land lease and/or labor purchase agreements are occurring. As the amount of family labor varies from year and even due to sickness or travel from one period to the next, some flexibility is necessary in any system. The old system allowed for this. Contrary to many generalizations about African land tenure, it was even possible to sell land, provided the purchaser was within the acceptable kin group. The governments could today take such transactions out of the uncertain extralegal realm, and allow them to be monitored, if they let local villages administer lands along the lines set out for the conseils ruraux in Senegal. A 1977 ISRA/GERDAT study group suggested that this authority be delegated to the village rather than (larger) communauté rurale level throughout Senegal. (see report appended).

2.9.6.5.Plot Size

The choice of plot size is currently done on an ad hoc basis, particularly in the small village perimeters. It is done essentially by dividing the amount of land developed by the total number of people who want to participate. On large perimeters it is decided in relation to the capacity of the technical package provided on a 'per/actif' basis. But given the strong influence that plot size has been found to have on other economic and social factors, including productivity, employment, savings, and marketable surpluses, it probably warrants direct attention . As concerns productivity, comparative data from around the world has shown that the smallest sized parcels (1/2 to 3 hectares per person) show the highest yield per hectare.Note that plots in this "small" category are larger than the largest size plots currently being allocated in the Senegal River Valley. It is difficult to compare, however, because much of the comparative data fails to specify whether allocation is per active person or per family. Much of the date seems to be per family, in which case the largest Mauritanian farms of

5 hectares per family would be within the medium range. But without knowing the average number of active persons per family, it is hard to compare. Another and more difficult aspect of productivity on small plots is that the yield per person is inevitably smaller, the smaller the plot.

This relates to the influence of plot size on marketable surplus, savings, and investment in the land. In general the study of land reform and redistribution schemes has shown that when large lands are redistributed among a much larger number of farmers, the proportion of marketable surplus is reduced. That is , for example, on small farms in Pueblo, Mexico, 61% of the producers of corn sell none of their harvest and 16% sell less than 25%. In contrast in Chili where the farm size is larger, 43% of the harvest is sold by the average producer.[16]

It is very diffcult to measure the effect of plot size on savings and investment of farmers. It is easier to see that the marketable surplus can serve as a rough indicator. If there is no marketable surplus, which is generally the case in the Senegal River Valley, or if the marketable surplus is too small, this is usually accompanied by soil exhaustion and poor maintenance of infra-structure. These latter are signs of negative investment or the gradual exhaustion of the factors of production.

This should be a serious immediate concern in the Senegal River Valley, where the average irrigated plot size, 0.2 to 0.5 hectares, is well below the lowest size at which technicians estimate a marketable surplus can be produced (1 to 2 ha per person)[17].

Another factor which elsewhere has been found to mitigate and improve the adequacy of maintenance and care taken of the soils is the security of tenure. In Kenya, for example, measures allowing security of tenure where shown to improve both levels of investment and productivity.[18]

The influence of small plot size on employment is as desirable as its influence on savings, and surplus is negative. Agriculture can be shown to be a highly flexible means of absorbing labor surplus. For example, data from 1968 in Forezepur, India, showed that farms of less than 13 hectares absorbed 83-95 man days per hectare of work, whereas those of larger than 13 hectares absorbed only 49-45 man days per hectare. Similarly, Latin America data has shown that small family plots absorb 30-60 times more workers than large multi-family types.

Given the current shortage of capital and organizational time available for the development of irrigation, and the labor surplus in OMVS countries, the initial decision to allocate plots to everyone who wanted one was logical. Yet in these circumstances it is not surprising that the projects have not yet produced marketable surpluses, nor been profitable for the development corporations. As the introduction of irrigation accelerates over the next five years, and river basin farmers master the techniques, a wider range of plot sizes may be introduced.

A final consideration which seems to have been a determinant in the decision to opt for small plots has been its influence on social justice. It is widely believed that the most just system is to allocate a little bit to each person who is interested. This is believed in both the traditional villages and by the development corporations, and is probably true in most circumstances. However, weak and poor families may only get a single plot while the larger families get several plots. It has already been shown that for landless families, the plots currently being allocated are not adequate for subsistence, and therefore do not free them from traditional inherited obligations.

A second caveat comes from looking at local equality vis-à-vis national and international inequalities. If equality is introduced in rural areas at a sub-minimal level, it may simply accentuate the gap between rural and urban incomes and the still greater gap between third world incomes and those in developed countries. In the Senegal River Basin where emigration has made the populations already thoroughly familiar with the details of those gaps, equalization at too low a level simply perpetuates or accentuates the existing out-migration. The same is true for security of tenure. At present OMVS country nationals can only register land and have written title to it in urban areas. Their chances of acquiring title in the capital cities are much greater than in local towns where the allocation process is bogged down. The preciousness with which land deeds are treated has become symbolic of the contrast between urban opportunity and the insecurity and poverty of rural life. Two policies have been found to ameliorate this contrast in other countries : 1) the registration of farm land and 2) progressive taxation on urban real estate and a much lower taxation on rural land.

2.9.7. LAND TENURE ISSUES AT USAID/OMVS SITES

The following notes on individual sites proposed for inclusion in the immediate production phase of this project illustrate well the long term necessity for new procedures for land acquisition. Even though several small perimeters have already been screened out of this proposal because of deep and apparently irresolvable land issues, there are numerous sites in our list where obstacles may still arise over land acquisition. In most cases knowledge of the multiple villages involved, available from the appended maps, will permit project personnel to negotiate equitable solutions. In some cases the only option may be to defer or cancel construction plans. The attached maps by Lericollais have been modified to show project personnel the existing patterns of village territoriality and use-rights for each site. Even territoriality (the only question covered in these notes) does not assure the cooperation of individual owning families. This must be determined and negotiated by the villagers and project personnel following the implementation plan for site feasibility determination and land rights inventories.

Mauritania : Gouraye Sector, from up-river moving down

1. Diogountouro - no information
2. Moulessimo - rehabilitation of existing perimeter, apparently no problem
3. Diaguili - no problem, according to existing perimeter head and SONADER sector manager.
4. Liradji (Al Islam) : Land appears to belong to Senegalese villages accross the river.
5. Woumpou - tentatively OK.
6. Sagné : Rights shared by three nearby hamlets, whose inhabitants should be allowed to participate.
7. Toulel - tentatively OK.
8. Wali : Goumal (Sen's) rights ?
9. Badinké : Unclear whether neighboring villages's rights also are involved.
10. Sinthiane : no information on site.
11. Fimbo Paliba : Gouriki Samba Diom (Sen), Gourel Thierno (Mauritania), also appear to have rights in the area ; when precise perimeter boundaries are discussed , this must be considered.

Mauritania : Kaedi Sector

12. Youmane-Yiré : tentatively OK.
13. Sive : site is on land of Diamel (Senegal) and Matam Reo (Mauritania).

14. Koundel Reo : proposed extension impinges on land of Nima, which, although located on the north bank of the river, is considered Senegalese and pays taxes in Senegal.
15. Tokomadji : the swamp portion impinges on Koundel Reo's territory.
16. Tetian: Peul village whose site belongs to the Tukulor village of Doundou, Sen.
17. Palel-Guiraye : Area proposed is used by six villages, not including Palel Guiraye ; 2 of them are in Senegal.
18. Sinthiou (Boumaka, presumably) and Nere : 7 villages' rights in the area are involved, 2 of which are Senegalese.
19. Dawalel: tentatively OK
20. (MBagne)-Dabbe : Is the hamlet of Sakobe included in site ?In participation ?
21. Winding - tentatively OK.
22. Sorimale : tentatively OK. Senegalese villages across the river may want to participate, as some of them farm in the area.

Senegal : Bakel Sector

1. Balou - no apparent problem.
2. Yafera : does the proposed extension impinge on Aroundou's lands ?
3. Koungani Marabout : No land problem foreseen, but questions of labor organization and equity should be raised (the marabout's disciples work the land on his behalf)
4. Koungani Village : No information on land, but serious problems of organization and motivation lead to current underutilization.
5. Collenga : Currently under construction. Land acquisition was obtained by participants' negotiations with owners.
6. Galalde : Proposed extension area belongs to Mouderi, as did the original perimeter site. The extension of Galaldé's perimeter should be contingent on its making available the land Gande needs.
7. Gande : The proposed site is in the territory of the neighboring village of Galalde, and the owners have refused to cede despite several years of negotiations by project personnel, SAED, and Prefet.

Senegal: Podor floodplain

8. There are serious and probably long term land tenure problems, both of territoriality and of owning families unwillingness to part with their land.

The fondé land on the southern floodplain, proposed by SAED and GERSAR to be diked and developed in the first three phases, belongs entirely to village to the south, east and west of Podor, none of it to Podor.

Podor itself is well endowed with the richer walo lands, some of which lie immediately west of the town and some on the north bank (Mauritania), but its land owning families have organized a determined resistance to its expropriation for development. Therefore the dike in the first phase is planned to bypass this land. Should land be taken from smaller, less organized villages and redistributed to the land poor farmers of Podor ?

Podor has extensive rights to large irrigable areas feasible for small perimeters on the Mauritanian bank, but no politically/legally practical means of developing them.

The following factors should be taken in negotiations concerning type of development and location :

* The walo lands are very valuable, and have been privately owned for generations. They are the current source of food supply (millet/sorghum), for which the irrigated rice fields proposed would not substitute since the local diet is based on millet/sorghum not rice.

* The government's insistence on paying no compensation to owners seems to be neither traditional, nor equitable, nor likely to produce a viable project/community relationship.

* Many families own land in the floodplain, not an elite few as is sometimes suggested.

* No other land is available to compensate those who might lose their fields for the development -the djeri is desertified and the walo fully occupied.

* Abundant irrigable land is already diked in at Nianga, only slightly more distant (across the Doué), for which there is insufficient labor supply for the foreseeable future. (11,000 irrigable hectares, of which 900 currently developed, and c. 350 farmed his year).

* The land-poor farmers of Podor are urgently requesting a perimeter, and expect it to liberate them economically from labor and share-cropping obligations they traditionally owe some of the major families. Some 450 indicated immediate willingness to enroll during the socio-economic survey.

* President Abdou Diouf has promised them a perimeter, and SAED is pressing to complete it.

Recommendations :

The sector manager and social scientist will have to guide extensive delicate negotiations with all of the 43 communities having rights in the plain, as well as SAED, recognizing :

1) That expropriation by fiat is legally possible, and SAED is tempted, but this may produce enough sense of injustice in this politically strong, well-organized community to permanently cripple the project.

2) That land owning villages and families will suffer permanent and important losses, and should receive some compensation, possibly in negotiated and exchanges.

3) That an option of PPVs in the south and plots for Podorians at Nianga should not be rejected out of hand, but discussed with communities and SAED. SAED objects that Nianga lies in a different communaute rurale than Podor, and points out that the conseils ruraux are supposed ultimately to administer land. This is true, but it applies equally to the whole southern half of the area that GERSAR phase one proposes to distribute to Podorians.

4) That if Mauritania and Senegal, as part of the planned policy negotiations precedent to signing this project, agree on possible modes of trans-national irrigated development, that opportunities for PPVs for Podorians on the north bank would be a priority alternative.

5) That a method of local, rather than SAED, tenure and administration of newly irrigated lands must be developed.

Mali : Kayes Sector

Mali has had many small village perimeters organized by the villagers, where they chose the site and agreed on distribution without problems. The plots are generally quite small. Mali has also has a few cases where land rights provoked major disputes, including the armed conflict at Sobokou resulting in 8 deaths,

and a couple where the villages claiming traditional rights to the land allow their animals to stray onto the projects to graze. The cases of serious conflict all seem to result from initial interventions of the State, in the form of the Governor using the right to expropriate "vacant" land for development, and allocatir it to groups of returned migrants. The lesson seems to be that, although the State can legally intervene, it is better for the long term success of the project if full negotiations are conducted with villages claiming the land, and their accord obtained. In some cases, residents are also bitter at having been excluded from participation in the project. The Governor and OVSTM noted that more attention would be paid to this dimension in the future. The proposed extension at Sobokou should be carefully studied in the light of this history.

Most of the perimeters proposed for assistance in this project are rehabilitation projects, where new land rights are not an issue. The one area where it could arise is in the large swamp of Goumbaye (410 ha, in phases). Saboucire owns the entire area, but thus far seems agreeable to sharing rights in an irrigation project there with the two neighboring villages of Sambaga and Kakoulou.

2.9.8. IMPLEMENTATION PLAN FOR LAND TENURE ISSUES IN IMMEDIATE PRODUCTION PHASE OF SRB/IDP.

Phase : Perimeter identification and construction

Level	Action	Timing	Place	Participants
National ; however, if any two or three countries are on the same schedule, it would be desirable to combine training sessions, particularly Senegal's and Mauritania's because of cross-national ownership patterns.	Training session for Host Country National social scientists in land law and custom, intro. and admin. during irrigation	3 weeks duration, 1 week field work prep. time and 1 week follow-up time for Land Tenure specialist 1-3 weeks six-months earlier for same, to plan with RDA ; planning to start while social scientists being recruited ; training sessions held as close as possible to their start of employment,	Sector HQ	HCN social scientists on project team ; whole project team for 1-3 d. Land Tenure specialist.
Village site or sites	During initial socio-economic survey and beginning of community organization, visit proposed sites, poll village on ownership, availability, willingness to distribute plots without discrimination based on	3-4 weeks ; steps 3 through Village 6 of Site selection Flow Chart	Village	Social scientist, animation team, villagers ; two one-day visits by technical team
Village	social origin or gender. Send women's, pastoralists', and fishermen's encadreur to initiate discussions with these groups concerning their rights and development interests. If special encadreurs not available social scientist does this.	1-2 weeks ; step 8 of Site Selection Flow Chart		Social Scientist, villagers.
	Survey and write up existing land uses of site(s) selected, existing rights in land, use, passage, woods and water ; clarify proposed land use and rights ; Identify and attempt informal resolution of any conflicts over same. If not resolvable, go to next step. If resolved, skip next step. Report to be filed at sector HQ, copy to LT specialist and local Conseil Rural or Prefet.			

Village	Establish land use and rights dossier for entire village(s)' territory. Arbitrate conflict. Refer to Conseil Rural or Prefet, if necessary. Dossier foncier original to Conseil Rural, copies in village, Sector HQ, and Land Tenure specialist.	3 weeks for dossier ; indeterminate time for conflict resolution. No construction until resolved. (Step 9 of flow chart)	Social scientist, national mapping agency if dossier foncier necessary (Direction de l'aménagement du territoire in Senegal ; service des domaines or Institut d'Economie Rurale in Bamako ; in Mauritania perhaps new land management being established under USAID AIP on Land Tenure ; Alternative service du cadastre in any of 3 countries.
Village/perimeter	Mapping, marking out of plots on land, distribution of plots (by lottery or agreed upon system), distribution of certificates identifying plots to recipients.	One week (Step of flow chart)	Social scientist, RDA technicians, perimeter participants.
Phase : Perimeter monitoring			
Sector HQ ; village ; perimeter	Social scientist verifies list of participants, notes transfers, conflicts, and labor arrangements in use.	Each cropping season ; Transfers, labor arrangeme ts and conflicts and their consequences reported upon in annual report.	Social scientists, perimeter participants, workers.
National capitals, all sector HQ, pre-determined random sample of perimeters; OMVS HQ	LTS Collects data on plot allocation, labor arrangements provided by OMVS Cellule de Suivi Socio-economique ; compares with data of project social scientists and RDA's. Verifies and discusses with villagers of selected perimeters. Reports to Sector staff and soc. sci. together discuss implications, modifications.	Annually in each country ; two to three weeks per country, during a cropping season. Two following weeks to prepare report ; Copies to all in next column, average 10 copies.	Land Tenure specialist, OMVS Cellule de Suivi, Sector social scientists and staff, perimeter participants, AID/OMVS.

Phase : Evaluation

National capitals, AID/OMVS HQ, RDA HQs, sector HQs, sample of perimeters, Conseils Ruraux HQs, Arrondissement and/or Prefet HQ.	Outside Land Tenure Specialist verifies progress and quality of project land tenure specialist(s)' and social scientists' land monitoring system. Compares with perimeters not having this system.	6 weeks at times of general evaluation team visits (3rd, 5th and 7th yrs or 4th & 7th depending upon final decision)	Outside Land Tenure Specialist, project Land Tenure Specialist(s), project social scientists and staffs of listed HQs.

DRAFT: IMPLEMENTATION PLAN FOR INSTITUTIONAL DEVELOPMENT AND POLICY COMPONENTS RELATED TO LAND TENURE IN THE SENEGAL RIVER BASIN.

To facilitate the evolution and formulation of a legal framework and land administration system permitting farmers of irrigation plots to have vested economic interest in their plots, it is proposed that the Ministry of Rural Development in each country establish a Study Commission, and invite related ministries and services (Domaines, Cadastre, Direction de l'Aménagement du Territoire, RDA's, agricultural research, and USAID/OMVS project personnel) to participate.

The Ministry would have a research fund of $ 50,000, to be used either in a single large study, or to commission legal, economic and social research and consultancies, to permit it to formulate projets de loi and systematize decentralized land administration practices. Studies to be designed during year 1, carried out during years 2-4. These studies and the resulting laws would consider a just approach to condemnation and expropriation of valuable walo lands for irrigation, the conditions under which community interest justifies the same, and some mode of fixing compensation to owners. They would also determine and document the legal status of land under irrigation distributed to community members, including consideration of transferable land rights earned by ten years of effective homesteading (mise en valeur), subject to restrictions on partition of plots and transfer to non-residents. They would establish regulations for the administration of land by local authorities.

In year 6 of the IDP, the Ministries in Senegal and Mali would hold a national colloquium on Land Tenure and Land Rights in Areas under Irrigation. Those who had conducted studies or consultancies commissioned by the Ministry Study Commission would present the results of their work, as would three to four experts from countries with analogous experiences, to report and compare countries' experiences. (Mauritania has already held a similar colloquium). In year 7 the OMVS would sponsor a three country symposium, bringing together the experiences of each with land administration and irrigation.

Years	1 through 5	Year 6 - 7
Mauritania	50,000	
Mali	60,000	
Senegal	60,000	
OMVS		25,000

2.10.1. Introduction

Among the Soninké of the upper Senegal River Valley a man proves himself by making his way to France in his early twenties and working until he has saved enough to take a wife, on average seven years for a first stint. After a year or two of married life at home and starting a family, he returns to France, now into a cycle of work and home visits likely to last most of his working years. Those who never make it to France linger in Dakar or Nouakchott, Nouadhibou or Bamako, working at whatever petty trade or service they can find, ashamed to return home empty handed. Tukulor men from neighboring villages also leave to look for jobs, but France is an option for only a small proportion, the majority preferring to "try their luck"* nearer by in Dakar or the secondary cities of the region.

Can the economic development of their homeland, long a neglected border area of Senegal, Mauritania and Mali, reverse this pattern? Can economic development even take place once this pattern is established, and a majority of the most dynamic members of the community are absent? These are familiar questions in developing countries, where most rural areas experience outmigration,** and development policies and projects typically list as one of their goals a reduction of the rural exodus. The Soninké area is an extreme case in a number of ways -- the distance and time involved in emigration, the scale of the opportunity gap between homeland and destination, cultural contrast between Soninké and French society, and perhaps most interestingly, the magnitude of the Senegal River Basin Development effort recently focused on the homeland. Because it is an extreme case the answers this area is beginning to suggest as to the relationship between outmigration and development are appearing earlier and more clearly than in many other areas of Africa. They suggest a negative answer to the hope of reversing the rural exodus through rural development in the next few decades, yet a positive one to the possibility of economic change and growth in the homeland, drawing on the positive aspects of migrant experiences and coping with the problems of continued outmigration.

Therefore it is suggested that the monitoring and evaluation of this project place less reliance on statistical volume of outmigration as an index of either development potential or project success. Instead they should continue to analyze the evolution of the migration process and the dynamics of communities that have institutionalized migration. The mature streams of outmigration emerging in the Senegal River Basin have continued

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* - Trying one's luck is the universal colloquial phrase for the migration experience. It connotes both the hesitancy with which a young man leaves his family and village for a harsher reality, and an almost Odyssean sense of quest for one's personal destiny.

** - Outmigration and immigration are used here for departures and arrivals in general, including citizens moving from one department to another within one country, as well as international migrants. Immigration and emigration refer specifically to those moving beyond national boundaries.

for more than one generation, and now show new patterns of adaptation, mitigating the most severe problems experienced in the first phase by both migrants and the home community. The choices made and patterns emerging at this point are crucial to the prospects for development in the homeland. For instance, remittances, the money typically sent home by the first generation, may dwindle as later migrants spend more on themselves and bring families to join them. Or money may continue to be repatriated, and be oriented less toward prestigious consumption and more towards productive investments. The few migrants who return may look on their situation as retirement or unemployment, and encourage a disdain for manual labor in their home community, or they may start new projects at home, introducing the work discipline and technological and organizational sophistication gained abroad. In the long term, another important factor is the extent to which political energies are expended in distant centers (either work-place or national capital) as opposed to focusing on development of the homeland.

The analysis of causes of outmigration typically focuses on "push" factors, the economic stagnation or decline of the area of origin, and "pull" factors, the higher incomes, more jobs, and better amenities in poles of attraction (urban areas, cash crop zones and developed countries). Labor migration always reflects unequal geographic patterns of development. In Africa there is a more specific pattern in which capital cities have been the major poles of attraction, and these are in turn surrounded by cash crop zones which also attract migrants and develop a fairly dense population. The outlying areas have become a neglected hinterland, and zone of outmigration. This pattern within nations also extends beyond national boundaries. There are actually four major poles of attraction in West Africa today in descending order of importance: Ivory Coast, Nigeria, Senegal and Sierra Leone. Landlocked nations (Upper Volta, Mali and Niger) and those in economic disarray (Ghana, Guinea) have become substantial net exporters of manpower.

The historic and geographic evolution of this pattern in the Senegal and Gambia River Basin areas is traced in Colvin et al., The Uprooted of the Western Sahel: Migrants' Quest for Cash in the Senegambia.[1]* This allows us to see the outmigration of the Soninké as a pattern of exodus from border areas in general. Young men from all ethnic groups in the Senegal River Valley migrate out of the area. [2] The Soninké are unique only in that they typically go to France, where they constitute 7 of every 10 African immigrants and their Tukulor neighbors are another &/10th. [3] The majority of Tukulor, Wolof, and Moor emigrants from the Basin make their way to Dakar, or one of the smaller cities of the region. [4]

Discussion of the consequences of migration have focused on the problems it causes for individuals, families, and both sending and receiving communities. Despite negative political and social reactions to immigrants, the economic consequences of migration are generally assessed as positive for the area of in-migration. It benefits from cheap, stable (not unionized) labor, willing to work at jobs disdained by local citizens, and having fewer dependents. Even the extent to which migrants compete with local workers for jobs has been seriously challenged by economic analysis. [5]

* All references are on page 152.

In contrast, economic analysis of the impact of outmigration on sending areas is universally gloomy. Jonathan Power, after surveying the recent labor migration to Europe and the United States, concludes that areas of outmigration have bleak economic prospects over the long term, and cites the Irish experience as an exemple 6/. He notes that even though sending countries and communities often encourage migrants in anticipation of the money they will return, the remittances are rarely spent on productive investments and even that they contribute little to balance of payments deficits since they are spent largely on imported consumer goods.

Looking more specifically at West Africa, Jacques Bugnicourt reaches similarly negative conclusions as to the impact on zones of out-migration 7/. He notes that sending areas tend to lose their most dynamic workers and in some cases more than half of their active-aged (15-64) male population. Remittances, he writes, tend to accelerate the penetration of the monetary economy, facilitate the collection of taxes, promote the consumption of imported goods, encourage the monetization of human relationships including wage labor, and inflate the local prices of bride wealth, housing and land. He claims that the apparent increase in economic activity that remittances stimulate translates too often an increase in commerce, which is largely in foreign hands, and into non-productive savings. He explores the psychological impact of migrants stories and behavior upon their return, remarking a dissociation between work and income and the impression in the local community that luck is more significant for success. Bugnicourt argues that the work experience overseas rarely transfers usefully back to the home area. Many emigrants work in factories (of which there are none in the Upper Senegal Basin), or as cooks, which is a woman's role at home. Even for those few who work in agriculture, the French agricultural experiences are ill-adapted to local conditions. He observes overall a severe loss of social dynamism, and frequently the emergence of regionalist political consciousness or even separatism arising out of migration related frustrations.

Such a picture would not bode well for the multi-million dollar Senegal River Basin development scheme currently being launched by the Governments of Senegal, Mauritania and Mali and a consortium of international donors. Indeed a decade ago when Soninkē and Tukulor societies fit this portrait to the last detail, the appropriateness and feasibility of investment on a large scale in irrigated agricultural development would have been questionable. But in the last five years irrigation projects have been launched in over three hundred villages in the Middle Valley (Dagana/Rosso to Matam/Kaedi) and Upper River (Bakel/Gouraye-Kayes-Bafoulabe). Returned migrants and migration-related capital have played a major role in bringing about the technological and organizational changes this development entails. In retrospect it seems certain that the "desenclavement" of this area would have been far slower, without the organizational initiative and capital resources of returned migrants. These then must be weighed against the problems associated with continuing outmigration.

2.10.2. Historical background

Out-migration in the Senegal River Basin began dramatically with the colonial conquest. These wars lasted in the river basin from 1855 through 1890, and pitted the Islamic holy warrior al-Hajj Umar Tall against the French intruders. Until that time the river basin had been a zone of in-migration for centuries. People were attracted to it by the variety of resources and opportunities it offered in comparison to the dry surrounding plains: water supply, two cropping seasons, fish, flood recession pasture lands, game, and an avenue for long distance trade.

The Tukulor are believed to be among the earliest inhabitants of the river basin, having moved in from the north as the Sahara desert expanded and built the empire of Tekrur which flourished in the ninth through eleventh centuries. The Soninké were also among the peoples attracted to the River Basin. They moved down as colonists from their famous empire of Wagadu to the northwest (better known as Ghana) as part of a trade diaspora in the 10th through 13th centuries when the empire was at its peak. They continued to trade and colonize trade routes all over the Senegal and Gambia river basin areas in subsequent centuries, even after their empire had been eclipsed by the more powerful Mali and Songhai. Both they and their Tukulor neighbors became pilots and crewmen in the flottila of French trading boats which mounted the river to the Bakel area every year during the flood season (August - November).

The colonial conquest set off two types of out-migration, one immediate and massive and the other slower and long term. The first wave were Tukulor soldiers recruited into the army of al-Hadjj Umar from the 1850s on. While statistical estimates are difficult if not impossible, contemporary accounts suggest that the emigration to join al-Hajj Umar affected more than half the adult male population of Futa Toro (the Tukulor homeland), and was devastating in its consequences both for those who left and for those left behind.

In the last years of the colonial conquest, from 1885-87, the Soninké experienced their own Islamic revolution, under the leadership of al-Hajj Mamadu Lamin Drame, a former disciple of al-Hajj Umar. Overthrowing both Tukulor overlordship and French domination, Mamadu Lamin led the Soninké in their moment of glory in 1885 and 1886. But the following year he was forced to retreat to the Gambia and killed.

Once colonial administrations were installed, the long slow process of individual outmigration began. The Senegal River was suddenly a border instead of the main trade route, and Bordeaux commercial firms drove Soninké and Tukulor merchants out of their traditional roles. The Upper River basin was divided among three separate French administrative territories: the Protectorate of Senegal, the military territory of Mauritania, and the French Soudan (now Mali). And the administrations resolved to force people into the cash economy as rapidly as possible, through the imposition of a cash head tax. This obliged every family to either grow a cash crop (in Senegal peanuts), sell some major capital item (cattle or jewelry), earn cash trading

in the dry season, or work for the Europeans. To do any of these except sell family capital, one had to leave the river basin. Forced labor also started some on the path to migrant labor. River villages had to provide porters, boatmen, haulers, and construction workers for public works and the rairoad.

Colonial rule also transformed the patterns of labor and occupational distribution in Senegambian societies, particularly in the centralized and highly stratified Tukulor and Soninké societies. The top and bottom were most immediately and radically affected. The ruling elite were eliminated by the conquest itself, as most of their jobs ceased to exist and they were destituted, or, at best, made junior administrators in a colonial hierarchy. Village labor organization was further disrupted by the 1905 announcement of the end of slavery. Over half the population of the river basin was of slave status. Soninké and Tukulor families responded to outlawing of slavery by transforming the system into a sharecropping arrangement. But many former slaves left in order to make their freedom real. Often they went to work as seasonal client farmers (navetanes) in the peanut growing zone, located along the Dakar-Saint Louis and Dakar-Bamako rail lines. Frequently they found the sons of nobles working alongside, sent to earn the family's tax payment.

The railroad was the seal of doom for the Senegal River basin. It became the central trade route, and traders abandoned the river. The port of Dakar supplanted the port of Saint Louis. Cash cropping (peanuts and cotton) had flourished here in the nineteenth century, but the upper river basin was now too distant from the developing markets of the Dakar area to compete with areas along the rail line.

A small but historically important number of Soninké and Tukulor made the transition from Senegal River boatmen to service in the French navy in World War I and II and in the French merchant Marines. After participating in the liberation of France in 1945, a few settled and found work in the post-war economy, mainly around Marseilles. As the economy began to recover in the 1950s, the demand for migrant labor grew rapidly. The majority of the migrant workers in France were North African and Portuguese, followed numerically by Spanish, Italians, Yugoslavs and Turks.

2.10.3. Modern migration

Black Africans were a tiny minority until the Algerian War (1952-58). Employers and North African migrants developed tensions, and a recruitment of Soninké began in the mid-1950s. Village level data from three recent studies agree in dating the latest upsurge in emigration to this recruitment campaign of 1957 to 1963. 8/ The first wave of migrants were in their twenties and thirties, a few in their forties. As the pattern of migration became established in the 1960s and 1970s, the median age of first departure has moved to 20 years; now about 90% of the first departures take place in the 15-24 age group. 9/

Tukulor outmigration from the river valley began to accelerate at exactly the same time. However, whereas more than 80% of Soninké have France as their destination, the Tukulor preference has been for Dakar and the peanut basin. Today more than 1 in 3 Tukulor live in Dakar and more than 2 out of 3 live somewhere outside of the river basin homeland.[10/]

Outmigration affects a similar proportion of Soninké, with an overall average of 30% of active age males absent at any given time, over 80% emigrating at one point during their lifetime, and more than half of the 15-25 year olds absent at present. [11/] Map 1, prepared by André Léricollais, shows the substantial variation in absentee rates from different villages of the Soninké area. Map 2, also by Léricollais, shows the distribution of emigration to France along the river valley and its concentration among the Soninké.

Another substantial difference between the two types of migration is in marital arrangements. While the vast majority of the emigrants to both France and other areas of Senegal are married (80% of the total and virtually all men over the age of 30), only 5% of the Soninké bring their wives to live with them in France, while the majority of Tukulor outmigrants eventually send for their wives and children. [12/] Thus the Tukulor children grow up in Dakar or elsewhere, while the Soninké children stay home until they are old enough to leave on their own. Part of the reason for this is that the government of France has subjected African emigration to increasingly tight legal control and made it difficult for wives to join their husbands. An additional reason is the determination to save, which is hard to do with a family in France.

Statistics from all Soninké areas studied show that the increasing legal obstacles to immigration in France have not slowed outmigration. The number of departures has continued to accelerate. Those who are arrested as illegal emigrants and sent back to Dakar merely await their next opportunity to return. And some are finding new destinations in Libya, the Middle East, or other African countries. Moreover, the stop and search policy of the Giscardian regime provoked embarrassed outcry at home (and Senegalese reprisal against expatriates in Senegal). The Socialists recently announced that identity checks would stop.

The typical pattern for emigration historically is to begin as seasonal departure, change to a temporary emigration for a period of a few years, and gradually become long term or definitive. There are important variations in this between the Tukulor and the Soninké, based primarily on the difference in destination. Only a small proportion of Soninké are retired, married, or otherwise definitively established in France, whereas the majority of Tukulor outmigration tend gradually to resettle. Figure 1 showing proportions of former migrants and of current migrants by age group, prepared by Weigel and reproduced here, shows that Soninké men are tending to stay away until retirement age (at age 55-60, 40% of the total male cohort (half of those that ever emigrated) are still overseas, and 20% of those aged 60-65 are still absent.) The Figure also shows a substantial proportion of returned migrants among the resident population. It is these migrants who as agents of change interest us in this paper.

The wave of outmigration in the late 1950s coincides exactly with a major socio-economic study of the river basin. 13/ The portrait that it paints of the river valley allows us to understand the conditions in which outmigration swelled. Independence was approaching, and people wanted their economic position to improve. Yet the river valley was still far from the zones in which cash circulated regularly. The money that went into the river valley was like an ink drop on the map surrounded by wide blank areas with no market economy. Remittances went into construction of housing and mosques, the purchase of jewelry, and the building of a herd of cattle. There was no point in investing it in agriculture, since there were inadequate men to work the land and no facilities for marketing any surplus that might be produced. On the contrary, part of the money was generally used to purchase food, or hire labor to grow it, for the family left behind.

During that time, and in fact until the late 1970s, the valley was almost inaccessible. Camel caravans were the main overland contact except during four months in the late dry season when trucks and jeeps could take the tracks running along either bank of the river. Pirogues from Saint Louis could reach Bakel and Kayes during the flood, but the annual arrival of trading fleets had stopped in the 1920s when the railroad was completed. During the rest of the year canoes could circulate only short distances. What consumer goods were in evidence generally had been pruchased in Dakar or even France, and opportunities for local purchases were minimal. The diet was limited to millet, sorghum, niebe beans, beref, okra, corn, peanuts, milk, fish, very rarely meat, wild leaves and local fruit. Gasoline was available only at depots so far apart that trips had to be planned around them, and repairs were difficult or impossible, so that vehicles occasionally had to be abandoned.

The drought of 1968-73 struck at a time when frustration over this situation was running high among emigrants, who had watched governments' investments during the first decade of independence go largely into their respective capital city areas. The difficulty that all three national governments experienced in delivering relief food supplies to the Upper River became an embarrassment and a source of reproach. Both locals and emigrants protested energetically. In the space of five years, half of the large livestock in the area died, the rainfed fields and pastures along the river bank turned to desert in the Middle Valley (but not the Upper River), a large proportion of the flood plain lands became useless because the flood was so meager, families rationed themselves to one meal or less per day, and starving refugees flocked to the towns. Pastoralists began staying out of the River Valley, since their flood plain pastures had disappeared.

The rainfall and ecology of the river valley have not returned to normal since the drought, but people have made substantial progress in adopting new strategies. Irrigation is the key element in the change.

2.10.4. The Multiplication of Small Irrigated Perimeters

Irrigation had already been tried in the Senegal River basin, mainly in the Delta from the 1950s on, and had not been notably successful. It had been introduced by outside firms, either private or state sponsored, on large 500-10,000 ha projects constructed and tilled by machinery. Farmers on these schemes became little more than inputs in the production process. The land had been appropriated without compensation to the owners, and many of those to whom it was distributed were recruited from outside the area. Farmers were presented with a complete package of inputs and a marketing monopoly at fixed prices. They had no say in the decision making processes. They came to see themselves as subsistence farmers, and yields were low. The great majority of farmers soon became chronically indebted to the state development corporations (SAED* in Senegal and SONADER* in Mauritania).

At the height of the drought, two pilot perimeters were started in villages near Matam using a totally different approach. Villages, with former emigrants in the lead, organized their own cooperatives and by hand did the canals and levelling necessary for small irrigated plots near the village. With the guidance of the French technicians and the initial capital input necessary for the first pump provided by the French, they were still able to keep control of essential decisions, including where and how and when to build, what crops to plant, and how to organize the marketing. Their first season was in 1972, just as the drought reached its worst, and news of their success spread instantly up and down the river. In 1973 a few new villages in the area initiated projects and by 1974 and 1975 the phenomenon was spreading rapidly through the river valley.

The initiative in almost every case came from outmigrants. Sometimes they organized a cooperative while still overseas. More often returned migrants enlisted fellow villagers. They realized that they had the necessary capital for some of the components of projects in their own savings. They also had access to farm equipment sales outlets, and technical assistance agencies of which their country cousins had never heard. They knew how to work in disciplined teams, to time their work and emphasize efficiency and productivity. And migration had been going on for so long by the time irrigation caught on, that most village chiefs were themselves returned migrants. While the migrant experience had not eliminated the prerogatives of birth, it had paved the way for more egalitarian approaches at home through familiarity with proletarian ideological tenets in Europe.

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* - Société pour l'Aménagement et l'Exploitation des terres du Delta (SAED); Société Nationale du Développement Rural (SONADER). Mali's equivalent, the Opération de la Vallée du Sénégal, Térékolé - Magui (OVSTM), was not organized until 1980.

Initially plots have been quite small, 8-25 ares (8-25/100 of a hectare). This allows all interested families to participate, and recognizes the capital and work intensive nature of irrigated farming. These plots are large enough to provide drought security to the families involved, who can earn extra cash in the dry season if their rainy season food crops are good, or switch to food crops on irrigated plots if their rainy season harvest was poor. The small size of the plots also reflects the fact that irrigated farming is but one small ingredient in the total economic strategies of river basin farmers, to be complemented by migrant labor, rainfed agriculture, crafts and trade. It tends to be a larger part in the economic strategy of land-poor families, and in a number of areas groups of hard working farmers of low social status have asked to expand to new and larger fields.

Migrants and returned migrants are involved in irrigation cooperatives all along the river valley, but those cooperatives, run exclusively by and for migrants (e.g. Sobokou, Samankidi, Danfagabougou, Bafoulabé), have some unique aspects. It is a phenomenon only of migrants to France, hence, predominantly Soninké and in the Upper River. These cooperatives are more tightly disciplined and have higher initial capital input and cash flow. The cooperative at Danfagabougou, for example, was not able to admit any local residents because villagers were unable to come up with the initial membership fee at the scale set by the migrants. The cooperative at Sobokou set a fine for 5 minutes lateness on days of cooperative work obligation at 750 francs, the same rate as was charged for a full day's absence in most other cooperatives. In other villages 5 minutes lateness would not even be noticed.

Exclusively migrant cooperatives also tend to have a slightly higher level of mechanization, investing for example in small motorized tractors as soon as the pump maintenance and depreciation fund has been established. They also tend to be among the few that are able to stay free from debt. They tend to prefer to get their technical assistance directly from expatriate advisors rather than through state development corporations. The leaders of such cooperatives have explained their aversions to government agencies in terms of a desire to maintain control over the development process themselves and to stay free from indebtedness.

The extension of SAED and SONADER into the Middle and Upper Valleys received a largely negative reaction from villagers and private voluntary organizations already working at small village irrigation projects in the area. The sophistication gained from overseas living made "villagers" more knowledgeable in many cases than the agents sent to "train" them. As government agents arrived to explain that they were coming to provide training and assistance, they were greeted by village leaders who asserted that their approach was too authoritarian. Residents claimed that the fixed package of inputs and marketing offered by SAED and SONADER simply resulted in taking all control of projects out of villagers' hands and leaving them in chronic debt. Furthermore many village leaders criticized SAED for trying to make villagers grow rice when in fact the staple in their own diet was millet.

The clash was most extreme at Khoungani, near Bakel, where the cooperative refused to have anything to do with SAED in the spring of 1975, and accused it of co-opting the technicians that the village had already recruited, forcing them to work for SAED instead of the villagers. 14/ In the standoff which ensued, the villagers formed a confederation of villages generally referred to as the Soninké Federation enlisting more than half of the villages in the Bakel zone. A similar confederation of predominantly Tukulor villages, called the Tukulor Federation, has since also been organized. The leaders of both confederations have overseas experience. The government has refused to recognize either, which deprives them of legal identity and bars them from signing contracts. While officials have been very circumspect in stating their reasons, they have let it be known that they suspect ethnic particularism in the motivations of the founders. For their part, the Federations disclaim all political character and note that their memberships are open to all ethnic groups and devoted exclusively to economic development. In this situation the private voluntary organizations originally financing the projects, CIDR, OXFAM, and War on Want, gradually withdrew from the Bakel area one by one, and USAID began providing technical assistance and financing in the region through a contract with SAED.

Having won the battle, SAED conceded most of the villagers' points in subsequent negotiations. It agreed that the village perimeters could organize according to a collective work mode if they chose, rather than in cooperatives along the SAED model, that they could grow crops of their choice, and market them locally. Villagers on both banks are in theory prohibited from selling their cereal crops across national boundaries, but in fact most of the produce seems to be finding its way into the Kayes region of Mali at present. Until 1981, farmers in Bakel were not allowed to transport their produce across Departmental boundaries for sale, which cut them off from their closest domestic market at Tambacounda.

Another government initiative, the paving of roads, along the river bank and improvement of the railroad, has received un uncritical welcome from all concerned. Most villages are still cut off periodically during the rainy season when their access roads flood, but the new road on the Senegalese side had greatly facilitated the repair of pumps and supply of fuel that used to cause frequent crop casualties. Without a road infrastructure, marketing of anything but imperishable cereals was handicapped, since vegetable and fruit crops are by far the most profitable dry season irrigated produce for farmers, and improved transportation system is essential. The governments of Mali and Mauritania unfortunately are still far from being able to envisage mobilizing the funds necessary for paved roads on their sides of the Upper River area. Both are counting on the year-round navigability hoped for from the Manantali dam to stimulate river traffic. Mali also anticipates substantial upgrading of the Dakar-Bamako railroad in connection with the construction of the Manantali dam. If, as some observers expect, the railroad proves inadequate for the construction firms building the dam and the latter decide to upgrade the road access to the dam site, these road links will go a long way to eliminating the historic isolation of the region.

The already improved transportation network facilitates the functioning of the independent non-governmental initiatives in the area, whether they be village cooperatives, private voluntary organizations, or local merchants. Migrants and return migrants have already within the last few years taken a leading role in private sector entrepreneurship, putting substantial investments into transportation enterprises; both river barges, which are rented out; and transport vehicles.

Earlier the question was raised as to the effect of continued out-migration on labor supply for irrigated perimeters. Irrigated farming takes substantially more intense labor than traditional rain-fed or flood-recession crops, as well as stretching labor far into the dry season when people traditionally travelled, traded, and earned cash from craft and construction. Yet we have noted that the rate of departure of young men has accelerated rather than diminished during the period in which irrigation has caught on. Not surprisingly in these circumstances, a close look at the labor situation on the existing perimeters shows that a significant portion of it is provided by other than family members. The rule in effect in all three countries is that the recipients of plots should farm them directly. Nevertheless, new forms of client and wage labor seem to be expanding on the irrigation schemes. For example, at the USAID sponsored scheme in Bakel, it was found that some 30% of the plots were being farmed by someone other than the person mentioned. 15/ At the Gorgol scheme in Kaedi, Mauritania, it was found that 41% of the registered plot holders were salaried workers, officials, or merchants. Twelve were marabouts (Muslim religious leaders), and only 45% were primarily agriculturalists. The marabouts send their young disciples to work in the field; sometimes they are supervised, sometimes not. Salaried workers and other monied groups may work their own fields some of the time, but will supplement with wage labor and other family members help in peak seasons. Even among the 45% who were primarily agriculturalists, traditional labor obligations were drawn upon. A similar pattern emerged for women's groupements where the vast majority of the women members used paid labor in addition to their own.

Who are the paid laborers? There has been no systematic study, but questioning of those working in the fields and employing people indicates that most are referred to as navetan, and originate generally in Mali or Mauritania, not far from the area in which they are working. Some are from villages set back from the river which have no possibility of developing irrigation, some are haratin from Mauritania seeking to escape the traditional 50% sharecropping system, some are herders destituted by the drought, and some are local school children.

There are also cases of multiple plots assigned to single families. These include not only former landowners, who are thus compensated for the loss of their land, but also large and unusually enterprising families of low origin who acquire more land because of their greater interest in farming. In most villages, migrants away in France or in African cities are allowed to be allocated a plot provided they send a regular cash contribution to the cooperative. This allows their families to survive and ensures the migrants of holdings once they return.

Many who are participating or sponsoring the irrigated development of the Senegal River valley wish to believe that this development will slow or stop outmigration from the area. The assumption seems to be that reversing a pattern of neglect will reverse its consequences. Now that it is not being neglected and capital is being invested in it, people will stop leaving. At the risk of being simplistic one could reduce this to an invalid logical syllogism. P (neglect) implies Q (outmigration) therefore not-P implies not-Q. The reasons that this logic will not hold in the case of the upper Senegal river basin are multiple. Most important from the migrants' point of view is that wage scales in France are so far above incomes in Senegal. The average migrant income in France in a 1972 study was estimated at 870 French Francs per month, of which 40% was repatriated to Senegal, for a total savings of 200,000 Francs CFA (1972 U.S.$816) per year. 16/ A 1978 study found earnings ranging from 100,000 to 180,000 CFA per month of which 20-43% was saved and repatriated. Of the repatriated sum, only 44% was sent back during the migrant's absence, by either postal mandate or personal correspondence, and 56% was brought back by the migrant himself. 17/ The average wage corresponded to 132,500 CFA per month and the average savings to 36% of that or the equivalent of 576,000 CFA (1978 U.S. $2,900). The typical jobs held included manual laborer (35%), semi-skilled worker (57%) and sailor in the merchant marine (35%). One third of them were working in the Marseilles area, another 1/3 in the Paris region, 1/6 in the Lille area and another 1/6 at Grenoble.

In contrast, net earnings from irrigation currently range from negative (cost of fuel, seed, fertilizer, labor and pump amortization exceed income) to ca. 200,000 CFA for the entire season (1982 U.S. $670). When one factors in on the positive side -- the education and maturity that a man gains by migrating - as well as on the negative side -- the hardship that he and the family left behind endure - the balance still comes out in favor of emigration for most men and their families. The educational opportunities,-- improved health care, rural electrification and other amenities -- that may over the long term come into the area as a result of the OMVS developments, as well as improved incomes due to better efficiency of farmers and development agencies, will certainly reduce the disparities. However, for the foreseeable future it cannot close the gap.

Moreover, even though one can expect local incomes in the river basin to be improved as a result of the introducton of irrigation, the geographic pattern of population distribution in the three country regions cannot readily be reversed. The river basin will continue to be farther from the main urban markets for foodstuffs than other food producing areas. Its only advantage relative to rainfed areas will be the possibility of producing dry season and drought year crops. These factors, together with the well established, even if recently modified, cheap-food policies of the respective governments, suggest that urban and immediately outlying rural areas will continue for many years to experience faster growth of incomes and population than the river basin. In other words, the local region's gaps are likely to widen before they diminish, just as are the incernational inequalities.

Yet one cannot properly speak of the labor shortage in the river basin, despite the sparse population and high rate of outmigration. The area under irrigation and total production could expand many times using the existing labor force more efficiently. But problems of organization, reliability and indebtedness have to be resolved as the perimeters expand gradually. The current projects enlist only part of the energies of part of (ca. 207) the villagers. As projects are gradually improving their rate of return and their reliability, that proportion can be expected to grow.

Another constraint on expansion is that a legal framework allowing secure tenure of irrigated land has yet to be developed. Land rights are currently vested in the cooperatives in the villages of the Middle and Upper Valley, and in SAED in the Senegalese Delta. SONADER's title is less clear. It controls 1/3 to 1/2 of the land in the large perimeters it has developed, but the legal tenure to that land is still being challenged and has not been decided by the government. The general rule in both large and small perimeters is that plots cannot be transferred except within families, and that they revert to the cooperative with no compensation to the person who leveled and/or otherwise developed the land. So long as villagers are not allowed to develop an economic interest in the land, there is little incentive for investing all of one's time and energies in irrigation. Canal maintenance and soil conservation measures tend to be neglected. While these other constraints continue to mandate gradual rather than sudden expansion, one cannot speak of an absolute labor shortage. The population is growing at a rate of about 3% in recent decades, corresponding to a doubling every 21 years. The combination of growth and local mobility allows considerable flexibility in the local labor situation.

The age structure of the returned migrant population in Figure 1, (above p. 11) shows that the higest proportion of them are relatively old. The proportion of returned migrants begins to be significant only in the 45-50 age group and increases sharply only in the 60-65 age group. Men of this age in traditional society tend to do more organizing and supervising and less direct manual labor. The migration experience also predisposes men to managerial roles, for returned migrants are among the wealthiest residents of the villages due to their overseas earnings. Many are willing to come back and work more intensely than those who never left, but they recruit young men from outside the family or village to complete age/task balance of their labor force. The continuing absence of young men and the available supply of navetan from still more disadvantaged areas and families suggest that client labor will be an ongoing feature of irrigated development.

In conclusion, it appears that outmigration has been institutionalized in the Upper Senegal River Basin in a way that allows it to be a positive factor in the spread of new technologies and the economic growth of the home communities. It gives the migrants a receptivity to technological change, and the capital and purchasing knowledge necessary to make it effective. Although only a small number of Soninké return before they are in the older age groups, at that time in their 40s and 50s, they have acquired managerial

and organizational abilities that are vey useful in the adaptation of new technologies in the home community. They have a political and economic sophistication that allows them to negotiate much more vigorously with development agencies over the terms under which development will take place, and ultimately gives them a larger role in the process. Returned migrants predominate among leadership of the new cooperatives that are being formed, and even in the roles of village chief. Enough of them have worked in mechanical jobs also to have brought a new mechanical maintenance capability into the area that was not present a decade ago. The experience as a marginal and temporary proletariat also tends to introduce more egalitarian ideology into the region, and prepare the way for reception of land-poor farmers of caste and slave origin into the irrigation developments.

Some of the same factors are at work in the Tukulor areas of the Middle and Upper Valley. Migrants have taken the initiative in forming cooperatives and mobilizing capital assitance for their home villages. However, from Dakar they are not able to generate as much capital as from Paris or Marseilles, nor are they as likely to return to participate in the project personally. Their home communities are more directly dependent upon SAED and SONADER assistance. The tendency for Tukulor outmigration to become definitive, and for remittances to dwindle as family members go along, makes outmigration a greater constraint at present for those communities than for the Soninké. Over the long term, however, they have the advantage that the Tukulor communities in Dakar and Nouakchott have become major forces in national politics and culture. Thus the two ethnic groups have institutionalized outmigration at similar rates, but with very different results. One maximizes the prospects of immediate capital accumulation in France and local development at home, while the other is tending toward long term urbanization in the capitals and less dynamic development in the original homeland.

Because this analysis suggests that outmigration from the project area will not be affected to a statistically measurable extent during the life of this project, reduction of the rural exodus has not been listed among the goals of the project. Nevertheless, both socio-economic monitoring and periodic evaluations must consider the continuing problems associated with outmigration. The OMVS evaluation unit will be collecting data on labor force patterns on the perimeters, and the 1983 censuses planned by all three countries should be analyzed by project evaluators for data on absentee rates and the age-sex structure of the local active-aged population. These data should enable the evaluation teams to update analysis of the way in which institutionalized outmigration evolves as irrigation and related rural development are intensified.

References for Pages 107-134

1 - Personal communication James Riddell, University of Wisconsin Land Tenure Center.

2 - On walo (regularly flooded) land farmers traditionally averaged 500 kilograms of millet per hectare per year. The same land converted to irrigation is regularly producing yields of 4.5 tons of rice per hectare during the rainy season, and a cool dry season crop of maize, vegetable crops, and/or millet of at least equal value.

3 - OMVS high commission. "Périmètres irrigués aménagés et équipés en maîtrise de l'eau : situation au 1er Juillet 1981," see map at end.

4 - See Regional Issues 5.1.5. "Outmigration and Rural Development".

5 - Government of Senegal, Service de la Statistique ; Abdoulaye Bara Diop, "La famille rurale wolof : mode de résidence et organisation socio-économique." Bulletin de l'Institut Fondamental d'Afrique Noire, ser. B, 36 (1974) : 147-63 ; and Pierrette Vuu Van Thai, Politiques de Formation, de Vulgarisation et d'Animation sur les périmètres Irrigués, Mauritania, April 1977.

6 - Andrew Manzardo, "Land Tenure and Community Development in the Islamic Republic of Mauritania," Madison, Wisc. : Land Tenure Center, January 1981.

7 - Ibid.

8 - C.I., p. 24.

9 - Banque Mondiale, Réforme foncière : politique sectorielle (Washington, D.C. 1975) : 33-39.

10 - OMVS, Socio-Economic Study, C.I.33.

11 - See C.J. Santoir in OMVS, Socio-Economic Study, C.VII.31.

12 - For example, at Dar al-Barka the 215 hectare site developed in Mauritania beginning in 1966, there was no prior consultation with peasants. As a result, they have never trusted what has been said since. Similarly, the FED attempt to develop the walo lands in Gorgol floundered on proprietors obstructionism, and SONADER's attempts to resurrect the scheme have been plagued by the residue of unresolved land claims. Similar problems arose in Senegal in the Delta and at Dagana.

13 - Interview, Mamadu Samba Bâ, Directeur de la SONADER, Section Kaédi.

14 - Interview, Richard Miller, AID Anthropologist, Dakar.

15 - Banque Mondiale, Réforme foncière : politique sectorielle.

16 - Ibid.

17 - Interviews with SAED and SONADER personnel throughout the Valley, plus AID/OMVS design team economist's calculations.

18 - Banque Mondiale, Réforme foncière, p.39.

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1/ Lucie G. Colvin, Cheikh Ba, Boubacar Barry, Jacques Faye, Alice Hamer, Moussa Soumah, and Fatou Sow, The Uprooted of the Western Sahel: Migrants' Quest for Cash in the Senegambia (New York: Praeger, 1981). The present paper is an outgrowth of that study, based on additional research and field work in the Senegal River Basin in 1981 and 1982.

2/ André Léricollais has mapped the pattern of outmigration from the entire Senegalese and Mauritanian portion of the valley, village by village. See "Peuplement et migrations dans la vallée du Sénégal," Cahiers de l'Office de la Recherche Scientifique et Technique Outre-Mer (Cah. ORSTOM), ser. Sci. Hum., 12, 2 (1975), 123-136 and maps at end.

3/ Adrian Adams, Le Long voyage des gens du Fleuve (Paris: Maspéro, 1977), p. 13. Concerning Soninké emigration see also Jean Yves Weigel, "Mode de migration et système de production soninké," (Unpub. thesis, IIIe cycle, Paris I, 1979); François Kane et André Léricollais, "L'émigration en pays Soninké, Cah. ORSTOM, ser. Sci. Hum., 12, 2 (1975), 177-188; A. Dubresson "Les travailleurs Soninké et Toucouleurs dans l'ouest parisien," in the same, pp. 189-208; Elizabeth Dussauze-Ingrand, "L'émigration sarakollaise du Guidimaka vers la France," in Samir Amin, Modern Migration in West Africa (New York: Oxford University Press, 1974).

4/ Concerning Tukulor migration see Abdoulaye Bara Diop, Société toucouleur et migration (Dakar: Institut Fundamental d'Afrique Noire, 1965); André Léricollais and M. Vernière, "L'émigration toucouleur: du Fleuve Sénégal à Dakar," Cahiers de l'Office de la Recherche Scientifique et Technique Outre-Mer (Cah. ORSTOM), ser. Sci. Hum., 12, 2 (1975), 161-176; and Yaya Wane, Les Toucouleurs du Fouta Tooro (Dakar: IFAN 1969).

5/ See e.g. Albano Cordeiro, citing Anicet le Pors, who found the repatriation of 150,000 migrant workers in France would free only 1,300 additional jobs for French citizens. Le rôle économique des travailleurs immigrés et leurs revendications (Conférence-débat de la quinzaine des migrants, 4 Mai 1979), published by the Office municipal des migrants de Créteil, 1979, p.75.

6/ Migrant Workers in Western Europe and the United States (New York: Pergamon Press, 1979) Ch. 7.

7/ "La Migration: contribue-t-elle au développement des zones 'retardées'?" in Amin, Modern Migrations, pp. 191-214.

8/ Adams, pp. 73-76; Weigel, pp. 26; and Dussauze-Ingrand, op. cit.

9/ Weigel, p. 43.

10/ Léricollais and Vernière, p. 161 et. passim.

11/ Kane and Léricollais, p. 177; Weigel, pp. 38-49; Adams, pp. 74-91; Dussauze-Ingrand, op. cit.

12/ Weigel, p. 40, Government of Senegal, Bureau National du Recensement. "Recensement national de la population du Sénégal, Avril 1976."

13/ Mission Socio-économique de la vallée du Sénégal (MISOES). Published as la moyenne vallée du Sénégal (Paris: Presses universitaires de France, n.d. (ca. 1962).

14/ Compare versions of Adrian Adams, op. cit., and Robert Aprin (one of the technicians involved), "Politique et aménagement hydro-agricole de la vallée du Sénégal: Résistance paysanne chez les Soninké." (Unpub.) thesis, IIIe cycle, 1981).

15/ Interview Richard Miller, AID/OMVS Social scientist, Dakar, July 28, 1981.

16/ Kane and Léricollais, p. 184.

17/ Weigel, p. 153-155.

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