

AN EGALITARIAN DEVELOPMENT PROJECT IN A STRATIFIED SOCIETY:
WHO ENDS UP WITH THE LAND?

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SUMMARY

This paper reports on the first year's results from a three-year research program on the dynamics of land tenure arrangements on a small-scale irrigation project in eastern Senegal. The research investigates changes in landholding patterns and land use on small (5-100 hectares each) pump-irrigated perimeters which have been in operation since 1976 and which are currently undergoing rehabilitation and expansion.

When project designers consider land tenure at all, they typically do so in one of two ways: either they assume it will not be affected by project implementation or they impose a tenure system consistent with the engineering, economic and political imperatives of the project. In fact, it is frequently true that projects induce social tensions within communities which lead to changes of land tenure relationships both on the project and off.

In the case considered by this paper, the stratified Soninke society of the upper Senegal River valley accepted a government plan for the allocation of irrigated parcels based solely on family size and not on caste, even though in the traditional system only members of the noble castes were landowners. In recent years there has been evidence of conflict among social strata which may threaten the viability of the project. There have been schisms along caste lines in irrigation groups, and several village perimeters have suspended operations for a season or more.

Key-informant interviews and parcel censuses were conducted in January and August 1987 with 15 of the 19 irrigation groups in the 13 Soninke villages covered by the project. Data from these visits plus agro-economic and socio-historical information about the perimeters are used to explain differences among villages with respect to changing access to irrigable land by members of different castes. On the basis of early and incomplete data, we have found that lower-caste people hold fewer irrigated parcels than their equitable share, as do women. Our information does not thus far permit us to state conclusively whether this inequality is increasing over time, but we expect to be able to at the conclusion of the research in mid-1989.

I. INTRODUCTION*

This paper explores the dynamics of land tenure on some small-scale irrigation perimeters along the Senegal and Falémé Rivers in the Department of Bakel in eastern Senegal. One principal motivation for this research was the impression, based on previous writings about the region, that the stratified societies whose members were the intended beneficiaries are extremely resistant to activities which threaten the relatively high status of traditional elites (Adams 1977, 1985; Weigel 1982). If this impression were justified, one would expect to observe either total failure of the irrigation effort or continuous efforts on the part of elites to control the project or appropriate its benefits. The former is not the case; the latter may well be.

The perimeters were mostly established in the mid-1970's, in a period when an unusual coincidence of factors were at work:

- the drought had severely damaged the local economy, making rainfed agriculture and livestock activities highly risky;
- the flow of remittance income from migrant workers in France was threatened by tightened immigration regulations and French unemployment;
- population pressure had reduced the land surplus which many of the villages previously felt they had enjoyed;
- the Government of Senegal was prepared to extend its development activities into the region for the first time;
- foreign donors had become concerned about the preparedness of riverine populations for the grandiose future development plans for the Senegal River basin.

The irrigation began under a propitious set of circumstances, most of which remain true to this day. The only one which may have changed is the climate: two good rainfall years have been sufficient to convince many that the drought is over. The drought may have been the factor which made the initial implantation of irrigation acceptable to local elites because the survival of society, including elite privilege, was at stake; if so, we should now be able to observe an intensification of the effort to control, appropriate or even destroy the project.

* Parts of the Introduction and Context sections of this paper have been adapted from P. Bloch 1987a, and the description of customary land tenure arrangements owes much to Traoré 1987, Sella 1987 and M. Bloch 1987.

II. The Context for the Study

A. Land Law

Enacted in 1964, the "Loi sur le Domaine National" was an attempt to combine the best aspects of customary African tenure systems with a modern egalitarian and democratic foundation. The right of private ownership of land was not recognized; the State was to be the manager of the national domain, which was virtually the entire land area of the country.* The state was given the right to designate any part of the national domain as being of public utility, and thus to take it from its previous users. In the absence of the exercise of eminent domain, however, farmers maintained their use rights without condition other than that they continue to cultivate the land actively. At the same time, the inegalitarian aspects of customary land tenure were made illegal: traditional landowning nobilities, present in most of the nation's ethnic groups, were dispossessed of any claims -- tithes and rents -- which they had on farmers in return for access to "their" land.

While the law made the State the guarantor of the national domain, it envisioned the establishment of a system of local government, one of whose major tasks was to manage rural land in a way that reflected local priorities and conditions. The administrative reform of 1972 established a system of communautés rurales, rural communities, organized according to local geographic and ethnic concerns, with a locally-chosen conseil rural as the legislative body responsible for land distribution. Until the reform, Senegalese local government, like the French, was merely the local manifestation of the central government, a quasi-military corps of governors and préfets. Under this system, the lowest level of government was the arrondissement, administered by a sous-préfet; the communautés rurales were established as subdivisions of the arrondissements. Thus the new system is intended both to bring local government one tier further down and to increase local participation in local government.**

The administrative reform was implemented region by region over the decade after 1972. The Eastern Senegal region, in which Bakel is located, was the last one to hold elections for the rural councils; these took place in 1982. The councils have done very little thus far, but it is clear that they will play a larger role in the future, assuming that the State continues its present policy of disengagement and decentralization. It also appears likely that the rural councils may serve as a modern means for traditional élites to maintain their control, legitimized by the trappings of democratic processes: in the Bakel Department the rural councils were firmly controlled by the same families who held the land in most of the villages.

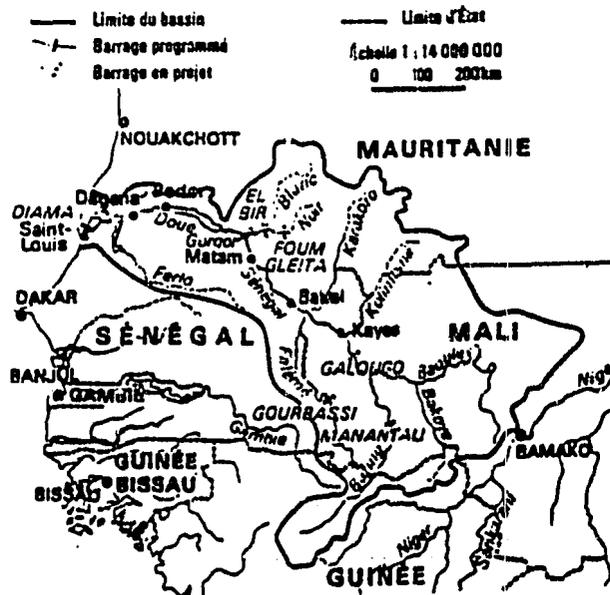
* Individuals were given a grace period of six months following the enactment of the law to register their holdings and receive title. Virtually all of the land so registered was urban.

** On the other hand, the independence of the communautés rurales from the central government is far from complete: rural councils' decisions must be approved by the sous-préfet, who in turn is closely supervised by his superiors, i.e. Dakar (see Hesseling, p. 16).

B. The development of irrigation in the Senegal River Valley

The Senegal River is one of the largest in Africa, and is second only to the Niger in the Sahel. Figure 1 shows the extent of the Senegal River basin, which drains 289,000 square kilometers. The principal tributaries of the system, the Bafing, the Bakoye and the Falémé, rise in the moist uplands of the Fouta Djallon in Guinea. The river system is highly seasonal: at Bakel, which is considered the dividing line between the upper basin and the valley, the average flow in September, the height of the flood season, is 3,320 cubic meters per second (cumecs); in May and June, the flow drops to about 10 cumecs (Platon 1981). There is also substantial inter-annual variation in the river's flow: this century, the largest average rate over a year was 1,241 cumecs in 1924, and the lowest was 264 cumecs in 1972.

FIGURE 1
Map of the Senegal River Basin



Reprinted from Atlas Jeune Afrique: Sénégal. Paris: Editions J.A. 4th ed. 1984.

To regularize this flow both within and between years, a dam has been built at Manantali in Mali. A complementary anti-saltwater intrusion dam has been completed at Diama, near the mouth of the River. Together these dams are to provide enough water for nearly one-half million hectares of mostly double-cropped irrigated land; in addition the upper dam will eventually generate hydropower and permit year-round navigation as far upstream as Kayes.

Most of the new irrigation development will take place on land which is now devoted to flood-recession farming during good flood years. This land, the so-called walo, is held by a minority of the population, mostly from the noble castes in both the Soninké ethnic group who are the majority group in Bakel and in the Toucouleur group who dominate the Middle Valley (for a description of the Toucouleur land tenure system, see Minvielle 1977 and Ngaido 1986).

C. Traditional Soninké land tenure systems*

The Soninké ethnic group is concentrated in the region surrounding the three-way boundary of Senegal, Mauritania and Mali. They are the dominant group along a 80 kilometer-long stretch of the Senegal valley on the Senegal side, from Ballou to Waoundé; Bakel, the principal town, is roughly midway. Soninké social structure is rigidly stratified into three broad groups: nobles, caste people and "former" slaves; the former has ultimate control over land although virtually everyone farms. Farmers from the latter two groups or from minority ethnic groups gain access to land in return for one or more of a variety of payments, depending on the type of land and the variety of payments, depending on the landowner and the farmer.** See Table 1 for a simplified schema of the caste system.

TABLE 1
Simplified Caste Structure
of the Soninké of the Gajaaga

Caste Name	Description
Hooro	<u>Nobles</u> : the kingly BACILI are termed <i>tunka</i>
Moodini	<u>Maraboutic</u> (clerical) families
Mangu	<u>Warriors</u> and military advisors to the BACILI
Nyaxamala Saxo Tégu	<u>Artisans</u> ; several subgroups are found, notably: woodworkers blacksmiths
Jaagarafu	<u>Former slaves</u> attached to the royal family of the Bacilis who have been assigned responsibility to manage the Waalo, Falo and Kollangal lands still retained by the Bacilis and to collect payments for use of those lands.
Komo	<u>Former slaves</u> without the above distinction.

* This is a very brief summary of a complex system; for more detail on the Soninké see Pollet and Winter 1971, Weigel 1982, and Traoré 1987.

** The principal payments for use of land are:

- diaka the Islamic zakat, generally 10% of the crop. This payment, supposedly a religious tithe, in fact is more frequently a very secular land tax paid to landowners.
- ñiñagumunkande, a small crop share (a basketful, literally) paid to the landowner.
- muso the same as the Toucouleur njoldi: a variable crop share paid to the landowner, the amount depending on the relationship between landowner and land user.
- debiguminkande, a small crop share (a basketful), paid to the village chief. Historically these payments could add up to more than half the crop. According to Traoré 1987 (p. 34), the system is breaking

Within a family (more precisely a lineage segment consisting of brothers, or ka), the oldest male, the kagumme is head of the family production-consumption unit and is responsible for land management. In dryland agriculture, the ka farms a large part of its land as a common field (té khoré), with an organization of work and distribution of product decided by the kagumme. Individual men and women usually have their own, separate plots which they farm in their spare time; the women's individual fields provide them with the only income over which they have any control.

Control of land is not the same in each village. The history of the relationship of each village to the Bacili kings over the past 200-300 years dictates which families own, control access to, and collect the land use payments on, the lands within the village boundaries. Tables 2 and 3 summarize this situation for the six villages in the region downstream of Bakel.

TABLE 2
Families Granted Direct Land Rights by the BACILI

VILLAGE	FAMILY NAME (French spelling)		CASTE
Manael	JALLO	(Diallo)	Mangu
Diawara	SAAXO*	(Sakho)	Moodini
	BA	(Bâ)	"
	DUKKURE	(Doucouré)	"
	BOMMU	(Bomu)	Nyaxamala: tégué
	KOYITA	(Ko"ta)	Moodini
Yelingara	SUMAARE	(Soumaré)	Hooro
	SIIBI	(Sibi)	Mangu
	DUKKURE	(Doucouré)	Moodini
	PAADIGA	(Fadiga)	Nyaxamala: tégué

* The SAAXO in fact bought the lands of Diawara from the Bacili (for one muud of gold, according to Traoré (1987)). They then ceded land to their allies, the other listed families, who had participated with them in the negotiations for the land.

TABLE 3
Villages Granted Usufructuary Rights to JEERI Land by the BACILI*

VILLAGE	LAND-ADMINISTERING FAMILY		CASTE
Mouderi	NJAAY	(N'Diaye)	Hooro
	SEK	(Seck)	Mangu
	DARAAME	(Dramé)	Moodini
Galladé	BACILI	(Bathily)	Hooro
	GUNJAM	(Goundiam)	Mangu
	DARAAME	(Dramé)	Moodini
Gandé	TUURE	(Touré)	Jaagarafu

* JEERI land is dry farmland. As Traoré 1987 notes (my translation) "in ceding the dryland to these families, the Bacili retained the totality of their land

Thus we see the complexity and diversity of traditional landholding arrangements within a very small geographic area. There are two types of villages, those where the Bacili have yielded their essential land rights on all types of land (shown in Table 2) and those where they have given a part of the bundle of rights, usufruct, on a part of the land (jeeri) while retaining them on the valuable land (shown in Table 3). It is not only nobles who control or administer land; families from all castes do so in one or more of the six villages. The Tuure of Gandé are the only members of the former slave caste listed.*

D. The Origins of the Irrigated Perimeters

The Bakel small irrigated perimeters (BSIP, in AID acronym) were established as a result of local initiative. Migrants returning from years of work in France and the former French Empire, notably Diabé Sow of the village of Koungani and Seydou Niangané of Ballou, wished to use the funds they had accumulated during their years abroad for some useful purpose at home, to prepare for the inevitable time when France's demand for African manual labor would dry up. With the help of a French NGO, small irrigation systems were developed in several villages in 1975, and USAID was approached by the NGO to finance pumping equipment. Flush with Sahel drought-related funds, USAID converted this small request into a \$3.1 million project, which became \$7 million by the time it was contracted out in 1977 (USAID 1977). The project's purposes were to provide immediate drought relief and also to permit learning-by-doing for an eventual expansion to medium- and even large-scale irrigation systems. Simultaneously SAED, the parastatal agency created to execute the ambitious program of Senegal River Basin development, asserted its control of all irrigation in the Bakel Department, even that which had preceded its arrival. From a self-generated and modest effort, BSIP quickly became bureaucratized, capital-intensive and outward-oriented. The Soninké, led by Sow and Niangané, organized a Federation of farmers to provide a counterweight to SAED's efforts to convert peasants into agricultural laborers. For a variety of reasons, the Senegalese government refused to recognize the Federation as an official organization until 1984. For an insider's chronicle of this situation, see Adams 1977 and 1985, which eloquently tell the story from Sow's perspective.

Sow's original idea was to generalize the family-wide té khoré to the entire village production group, approaching a socialist model of cooperative production. Thus the earliest irrigated perimeters were collective in nature, with labor being contributed equally by all participants, on a schedule determined by the head of the groupement, the production group, the analogue of the kagumme. The produce was divided equally among all participants, as well. SAED pushed for individualization of parcels, of farming decisions and distribution of rewards, although the groupement as a whole was to remain responsible for reimbursement of input loans. In practice in most of the Soninké villages, the perimeter extensions after the first two or three years have consisted of the creation and expansion of family plots, frequently but not always managed as té khoré fields, with the village collective field becoming decreasingly important.

It is important to note that both systems, the collective one espoused by Diabé Sow and the individualist one promoted by SAED and financed by AID, are revolutionary: they are based on the principle of ignoring caste distinctions in granting access to irrigated land. By diverting attention away from this fact, the struggle between SAED and the Federation has most likely served the interests of the traditional élites, whose attachment to ideology or to theoretical arguments about incentives is unlikely to be strong and whose efforts to maintain or restore their authority are unremitting. The drought made irrigation possible, as the head of a Soninké groupement was quoted as saying in 1983 (Bloch 1986) and did say again in 1987:

"Quand quelqu'un se noie, si vous lui tendez un objet, fut-il un couteau, il s'en saisit pour avoir la vie sauve et c'est dans cet esprit qu'on avait accepté la SAED."

In the past few years, people in the region have begun to perceive that the drought is over. As this perception intensifies, the threat that irrigation represents may be more easily dealt with by an elite whose fear of drowning has diminished. If the traditional agricultural system, combined with remittance flows, can once again provide a fairly reliable basis for the restoration of the old patterns of dependence, nobles may prefer this to continued risky experimentation with innovations like irrigation. Insofar as the power of the nobility has not been broken yet, and there are few signs that it has been, irrigation may therefore face eventual failure.

E. Design of the Perimeters

SAED was well aware of the need to clarify landholding issues. While its technicians identified irrigable land according to technical considerations, the village chief was always consulted and the agreement of the traditional landowners always requested and usually received. In all cases, the traditional landowners ceded to the groupement the right to use the land, without relinquishing their traditional claims of ownership. There appears to be a consensus in the villages that if the groupement stops irrigating, the traditional landowners may take back their land, even though the national land law has invalidated all traditional land claims.

SAED imposed a condition of equal access in return for its assistance in developing the perimeter. In other words, the groupement was to be open to all residents of the village who wished to join, regardless of caste or gender. The only initial condition was to participate in the land preparation work which needed to be done before the works could be installed.* In no village did all households participate, although at the outset the majority usually did. Non-participants are, according to participants, the most conservative, xenophobic villagers, who feared that the village would merely be working for white people.

At the outset, village groupements farmed the land collectively, as Sow had envisioned. For one or two years most groupements succeeded quite well. Then the universal problem of collective agriculture, the free-rider problem, raised

* Most villages accept men as new members without the clearing prerequisite if they pay a small membership fee; women are not always given the same opportunity. See M. Bloch 1987

its head and many of the groupements began responding to SAED's recommendation that the perimeter be individualized with the available land being divided among the willing participants. SAED instituted a lottery system for plot choice, with no discrimination between castes.

Notwithstanding SAED's condition of equal access, there is a great deal of variation among villages in women's access to irrigated land. Married women are almost always counted as members of the ka for the purposes of membership in the irrigation groupement. Sometimes, as in Ballou I, their participation awards the ka the same amount of land as men's participation does; sometimes, as in Aroundou, their participation counts only half as much. Sometimes, as in Diawara II, wives and other dependent women are not permitted to participate at all, although female heads of households do. Because households generally have more adult women than men due to polygamy, the amount of irrigated land a household can have depends strongly on how women are treated.

Two other principles upon which SAED insisted were equality of plot size per participant and of land quality. This too was done to enforce equity of land distribution. These conditions appear to have been observed, at least on paper. In a few cases the groupement leaders were given extra land or the first choice of land, but the design of most perimeters was an effort to minimize differences in quantity and quality, as well as in access to water. The typical design is shown in Figure 2, which shows the Aroundou perimeter.

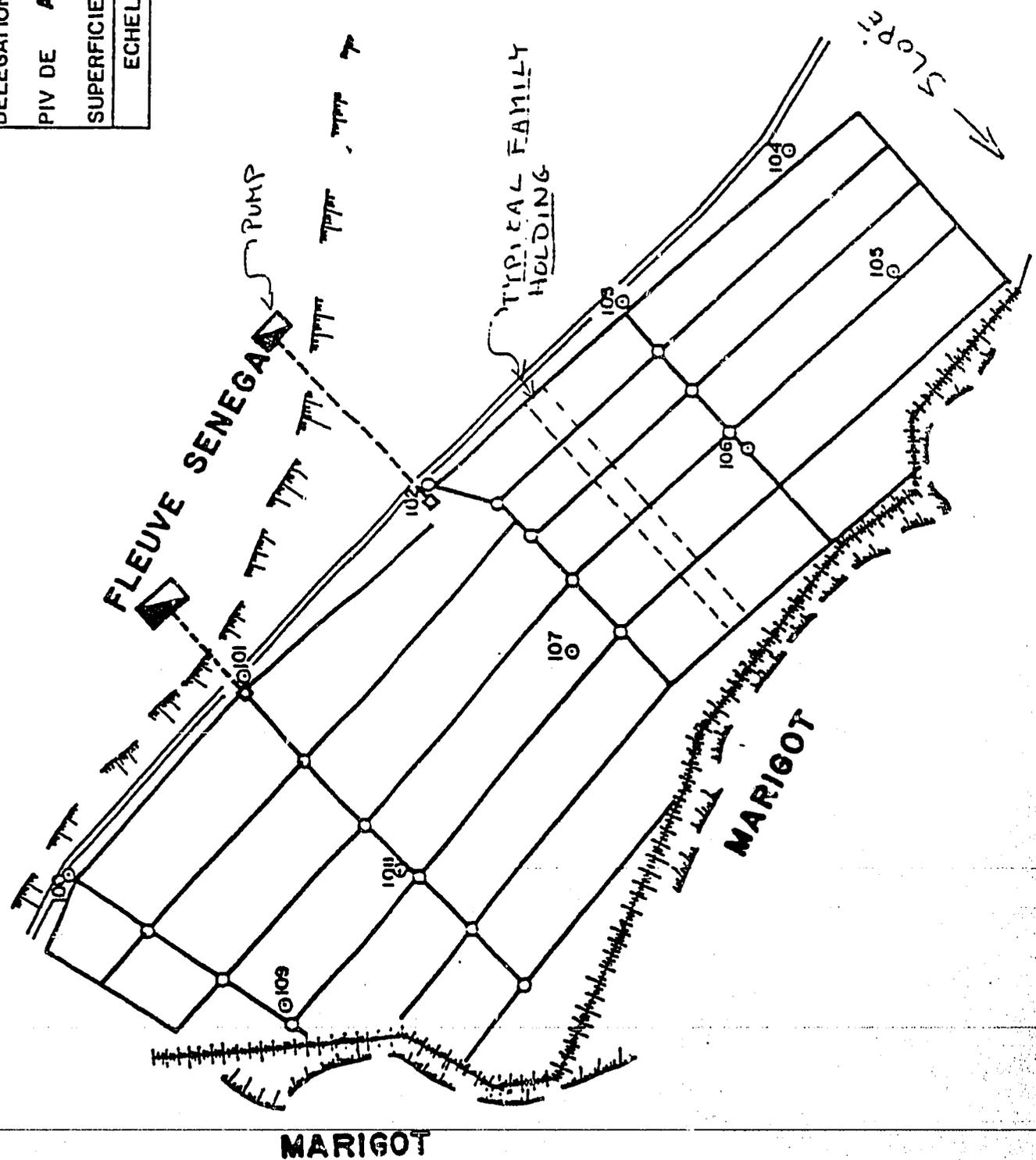
Water is lifted from the river by two pumps over the high levee-like riverbank, and water is spread via the canal system shown. The plots are long, narrow strips extending from the high point of the system (the canals marked by the points numbered 100-104) and descending the gradual slope towards the "marigot," or depression. The high land near the head of the system tends to be sandy and permeable, thus not well suited for rice, and the lower land near the marigot tends to have a higher clay content and thus holds water better for paddy rice cultivation. Thus all farmers have land near the head of the irrigation system, sandy land and clayey land. In the particular case of Aroundou, each household is assigned land according to the number of participating adults: a strip 800 meters long (to the fifth parallel secondary canal) and 10 meters wide for each male and 5 meters wide for each female. A typical household with two adult males and seven adult females would therefore have a 800 by 55 meter field to cultivate, or over 4 hectares. Most perimeters have smaller individual holdings than Aroundou does, but the principle is the same.

The current status of the Soninke perimeters is shown in Table 4.* Each village had one perimeter as of the mid-1970's, and then in the mid-1980's more perimeters began to be constructed as the limits to expansion of the old locations were reached (as in Diawara) or schisms broke apart the groupement (as in Ballou). In every village there is an expressed demand for more land, both to expand the size of individual holdings and to increase the number of people with access to irrigated land.

* There are several new groups in the process of formation, and there are also two other groups (Kounghani Marabout and Aroundou Emigres) which are atypical because the groups were organized around a single individual or family and have remained so. have been the situation on 14

SAED
DELEGATION DE BAKEL
PIV DE AROUNDOU
SUPERFICIE
EHELLE : 1/4000

FIGURE 2
Design of the Aroundou Perimeter



Reprinted from USAID, Evaluation des Sites des Petits Perimetres Irrigues Villageois. Dakar, June 1986.

TABLE 4
Selected Characteristics of Irrigated Perimeters
Soninke Villages, Department of Bakel

PERIMETER	Year Founded	Village popu- lation	Area (ha.)	No. of Mem- bers	Area/ Member	% Area Farmed in 1986	Percentage of:		
							Nobles	Slaves	Other
Ballou I	1976	2499	120	476	0.25	88.1%	74	9	17
Ballou II	1986	"	44	274	0.16	100.0%	36	57	7
Aroundou	1976	1436	76	187	0.41	99.3%	57	23	20
Yafera	1976	1271	102	211	0.48	62.7%	n.a.	n.a.	n.a.
Golmi Marabout	1975	2417	25	222	0.11	100.0%	41	0	59
Kounghani	1975	1415	37	160	0.23	98.6%	n.a.	n.a.	n.a.
Bakel Kollangal	1982	8015	178	543	0.33	96.1%	20	71	9
" Gassambilakhe	1976	"	42	342	0.12	68.8%	17	78	5
Tuabou	1975	1393	42	72	0.58	100.0%	31	54	15
Manael	19??	1212	25	267	0.09	100.0%	51	19	30
Yelingara	1976	602	18	106	0.17	100.0%	n.a.	n.a.	n.a.
Diawara I	1976	3682	96	616	0.16	87.5%	n.a.	n.a.	n.a.
Diawara II	1985	"	50	345	0.14	100.0%	n.a.	n.a.	n.a.
Mouderi I	1976	3547	68	135	0.50	100.0%	28	58	14
Mouderi II	1985	"	62	117	0.53	100.0%	15	55	30
Mouderi III	1987	"	50	59	0.85	--	20	32	48
Mouderi femmes	1987	"	10	215	0.05	--	29	49	24
Galiadé	1976	698	38	192	0.20	12.5%	50	49	1
Gandé	1976	585	19	89	0.21	26.3%	n.a.	n.a.	n.a.

Notes: n.a. means "data not available at this time."

- for Yafera, Kounghani, Yelingara and Diawara I, missing data are due to these groups' unwillingness to participate in the study.
- for Diawara II and Gandé, missing data are due to data recording errors in our census which will be corrected in the future.
- Golmi Marabout is a perimeter which was originally constructed for the sole benefit of the important religious leader (marabout) residing there. Golmi is the only Soninke village which does not have a groupement. Several people whose land borders the Marabout's have joined his perimeter in recent years.

Sources:

Year, Population, Area, % Farmed in 1986: SAED and USAID data.

No. of members and caste composition:

Project census (SAED data on members for perimeters we could not visit)

There are substantial differences among perimeters along all the dimensions shown in the table:

- 1) The villages are all large by Senegalese standards, reflecting the importance of access to the river. But they range in size from 600 to nearly 4,000, not including the administrative and market center, Bakel.
- 2) The size of the perimeters has a wide range as well, although none is large by any standards. To give a relative scale of comparison, the Gezira scheme in Sudan has over 1 million hectares; the Office du Niger in Mali has 50,000, and a typical Middle Valley perimeter in Senegal has 1,000.
- 3) Membership of the groupement ranges from tiny, in Tuabou, to substantial in Ballou, Bakel and Diawara; in the latter three formal subgroups have been organized to cope with management on the tertiary systems. In spite of efforts by SAED to make the allocation of land equal within villages, there are substantial differences in land per member between villages. This is generally due to differences in the availability of good irrigable land: Manaël, which has an abundance of dryland, has had to seek irrigation land within the village limits of Tuabou, which has limited dryland but more irrigable land than it presently uses. Given the history of the region, however, and the inter-village conflicts over land which are being played out currently, it is not likely that SAED will be able to equalize land per person across the villages in the project until a stage where the perimeters have grown to transcend village boundaries.
- 4) Most of the land was being farmed in 1986, with only two perimeters, Galladé and Gandé, showing substantial unused area. Both groupements blamed poor land-clearing by SAED on new irrigated fields for this situation. Two others, Yafera and Bakel Gassambilakhe, farmed about two-thirds; there is no way of knowing from the data whether this was two-thirds of the farmers or two-thirds of the acreage of each farmer. 1986 was the second year of good rains in the region, and in 1987 there were signs that farmers had gone back to dryland farming at the expense of irrigation. In the 1987 rainy season (the principal one for irrigation), Aroundou did not irrigate at all, and during our field visit in August of that year fewer than one-third of the parcels had been prepared for transplanting rice -- one month later than usual. All groupements appeared to be unhappy with the unavailability of credit for purchase of inputs, and farmers began to think that the prospects for dryland farming had returned to pre-drought levels. If we had 1987 data, the numbers in Table 4 would look very different.
- 5) The caste composition of the perimeters varies considerably. In the absence of village census data (which we will have by the end of the project for at least some of the villages) we cannot determine whether membership in the irrigation groupements is proportional to the village population. One observation which should be made, however, is that the proportion of komo (slaves) in the two Bakel groupements is substantially greater than that of any of the villages; we suspect that many of the members of these groupements are migrants into Bakel who came from the villages because they had inadequate access to land at home. There is one dramatic within-village difference to indicate, as well: Ballou I has 74% nobles and 9% slaves, whereas Ballou II has 36% and 57%, respectively. The story of the Ballou schism has been discussed in Bloch 1987a.

III. Approach and Preliminary Findings of the LTC Bakel Research Program

The introduction of small-scale smallholder irrigation systems into a stratified society can lead to a variety of outcomes with respect to the dynamics of land tenure:

1. The project survives and even grows over time, and:
 - a. The original beneficiaries retain their land;
 - b. Some original beneficiaries lose their land through abandonment or failure to pay debts to the groupement, leading to:
 - 1) increasing concentration of landholding in the hands of elites and/or commercially-minded farmers;
 - 2) no change in land distribution among families or castes but merely a reshuffling to former non-participants and outsiders (this is unlikely, given the absence of institutions such as land markets).
2. The project fails (stops operating, thus effectively eliminating all participants' access to irrigable land) due to:
 - a. unwillingness of elites to participate in irrigation;
 - b. inability of elites to get their dependent farmers to pay tribute and to farm their irrigated plots for them;
 - c. successful takeover of the scheme by elites which causes caste people and captives to opt out of the scheme;
 - d. other causes altogether.

In the early years of the perimeters, up to about 1980, it appeared that option number 1.a. was occurring. Weigel (1982) depicts an enthusiasm for irrigation which spread throughout the community (Mouderi), although the kome appeared the most enthusiastic, even going to the extreme of hiring day labor from seasonal migrants to ease their labor constraints during peak periods. In the early 1980's, renewed drought gave added impulse to the perimeters and motivated USAID to finance rehabilitation of much of the irrigated land and a doubling of the acreage of most perimeters. In more recent years, especially since on one hand the government subsidies on inputs and availability of credit have been reduced, and on the other hand people are convinced that the drought is over, the enthusiasm has diminished in most villages -- although not in Mouderi, where four perimeters exist and at least two more are in the process of formation.

Our research program is centered two closely related questions:

1. are there differences in access to irrigated land by gender and caste, and is this situation changing over time?
2. how do households decide how to allocate their labor time between irrigated and dryland farming, given that the two activities have overlapping peak periods?

The core data of the project are being collected by two graduate students, an agricultural economist and an anthropologist, who began fieldwork in January 1988 and who will remain in the region through December. The anthropologist will concentrate the first question in the turbulent and dynamic context of Mouderi, and the agricultural economist will address the second question, and will conduct comparative studies of several perimeters with both intensive interviews and surveys.

In the preparatory year of the project, two brief visits were made to the study area, to initiate contact, to secure local approval for the research, and to conduct key-informant interviews and the already-mentioned parcel census. These visits have produced several papers already: P. Bloch 1987a and 1987b, M. Bloch 1987, and Traoré 1987 (all of which are available by request to the present author at LTC) in addition to the present paper. But the analysis we have done thus far has been quite anecdotal, and should be considered tentative until verified by the data generated in the intensive field phase of the project.

There is one quantitative result which can be reported here, subject to the previous paragraph's caveat. The parcel census consisted of a list of names of members of each groupement, together with their gender, caste, number of parcels held, and relationship to the head of the family. Inadequate supervision of the census taker created a large number of dubious observations, but there are still some salvageable data about which we can have a certain confidence. Given our research focus, we have chosen to express the hypothesis to be tested in the following way:

Hypothesis: The SAED/USAID project has not been totally successful in ensuring equal access to irrigated land for women and subordinate castes.

A multiple regression of number of plots on gender and caste should give an indication of the extent of differentiation in access to irrigated land. Unfortunately, our data are incomplete: reliable figures on the number of plots are available for only 369 groupement members (of 3190) because of errors in the recording of census data in the first round of analysis. We think that the great majority have only a single plot, but we have preferred not to impute figures where none existed.

While we caution the reader not to generalize from this nonrandom sample, the results are sufficiently clear to warrant reporting here. The number of plots assigned to the individual or the kagumme is the dependent variable and the explanatory variables are gender, a dummy variable having a value of 1 if the person is female, 0 if male; and caste, a dummy variable having a value of 1 if the person is a member of the former slave caste, a kome, and 0 if any other caste. The results are shown in Table 5.

TABLE 5
Regression of Number of Plots on Gender and Caste
Census of Bakel Groupements, 1987

(Dependent Variable: Number of plots assigned to an individual or kagumme)

<u>Variable</u>	<u>Coefficient</u>	<u>Standard Error</u>	<u>P (2-tailed test)</u>
Constant	2.406	0.122	0.000
Gender	-1.232	0.135	0.000
Caste	-0.371	0.133	0.006
Adjusted R ²		.189	
Number of observations		369	
Standard Error of Estimate		1.272	

Both explanatory variables are negative and significantly different from zero, and together they explain about 20 per cent of the variation in the number of plots per person. The interpretation of the negative coefficients is that women have fewer parcels than men, and that komo have fewer parcels than members of other castes. The result on gender is not surprising, given that women rarely can call on others' labor but that men frequently can. The result on caste is, however, not expected from the history of the institutional arrangements of the project. Its designers at USAID and its implementers at SAED had a strong egalitarian bias, and we have already referred to the evidence that komo were the most enthusiastic adopters of irrigation in its first few years in Bakel (Weigel 1982). The concern expressed in the hypothesis that project results have been less egalitarian than project goals has one piece of confirming evidence.

IV. Conclusion

This paper has presented some evidence of inegalitarian access to land on the Bakel Small Irrigated Perimeters. It complements the case histories described in Bloch 1987a, which chronicled some of the tensions which have arisen in several of the groupements. There is a need for more definitive results before we can cry from the rooftops that the project's egalitarian goals are being overturned. We can, however, reiterate our concern that it is not sufficient to provide an equitable land distribution in initial project design, because that distribution may change over time if powerful individuals or groups see an interest in changing it. Alternatively, powerful individuals or groups may instead attempt to challenge the project if its success calls their privileged socioeconomic status into question.

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ANNEX I

The Ballou Schism

Ballou is a village of moderate size -- 2,500 inhabitants -- on the Falémé, just above its confluence with the Senegal, and is the furthest upstream of the Soninke villages. It is probably the most isolated of the Soninke villages during the rainy season, as it is the farthest away from the all-weather road. It has ample lands, both fondé and jeeri. It has a single dominant family, the Niangané, many of whom have had successful migration experience, not only in Europe but in North and Central Africa. While its location is relatively southerly, implying more rainfall than at the northern, downstream end of the Department of Bakel, there does not appear to be any more reluctance to irrigate in Ballou than in, say, Gandé, at the downstream extreme of the Department.

Ballou has the largest irrigated area and the largest number of group members of any of the villages affiliated with the BSIP except Bakel itself, with 720 members as of 1985. In that year, an election of the leadership of the groupement (production group) led to a schism. The former president, who had been defeated by his half-brother, led the schismatics, who formed a second groupement, Ballou II, and sought land for a perimeter and help from SAED in preparing it. The second task was easy; SAED offered help with a grader, as they intermittently had during previous extensions of the original perimeter. But getting land was not as easy.

The procedure envisioned by the law is to apply to the Communauté Rurale (CR) for use rights; in principle there is no reason why the CR should refuse local inhabitants who wish to use land productively. But the schismatics did not go to the CR initially, but rather to the village chief, as customary law prescribed. The chief, a Niangané also, refused to grant them land. They then went to the village's representative to the CR, also a Niangané. He refused to intervene. So finally, as the third step, Ballou II took its request for land to the CR itself. The principle became fact: the CR granted the groupement the land it requested.

There are several possible explanations for the split, and several more for the history of Ballou II's land request. First, there is the simplest explanation that a defeated president opted for exit after having had relatively complete control of the perimeter since its inception; the corollary is that the chief and the village CR representative wished to punish their ~~cousin for splitting up the groupement.~~ Second, the split might have become inevitable due to the large size of the membership. In other parts of the Senegal River Valley, groupements tend to be much smaller than in Bakel, although as Fresson (quoted in Bloch 1986) said, homogeneity of membership appears to be more important than size of membership. But none of the groupements she studied was anywhere near the size of Ballou's. The relatively great social cohesion of the Soninke might predict that larger groupements would be possible there than among Wolof or Toucouleur. Still, 720 members (of whom 190 were men, grouped in 59 kas) is a lot under any circumstance. The breakup may have been inevitable. Third, there is the possibility that the split was only partly related to the election, and partly also to increasing social tension brought about by the equalization of incomes and thus status which irrigation implied. The Ballou II membership list shows that 57 % of

the members are komo, "former" slaves, whereas only 9 % of the Ballou I members are; 74% of Ballou I are hooro, nobles, and only 36% of Ballou II are. The interpretation is that the split occurred because caste issues were beginning to be raised -- the irrigated perimeter was (finally) judged to be a success, so the traditional leaders decided they wanted to control it, which meant reducing the role of the casted people and slaves. Seydou was probably a relatively minor member of the Niangané family, who legitimized the original perimeter at a time when the village leadership was unwilling to commit itself to irrigation; the komo may have asked him to serve a similar role in getting them out from under the dominance of the traditional leadership in Ballou I. Whatever the legal status of the CR and the equality before the law of all Senegalese, it is highly unlikely that a group of komo could have succeeded in persuading the CR to grant land to them without a leader from the hooro or noodin classes.

The quote on page 8 of the main text becomes relevant here. The drowning person is not representative of the entire village, but only of the elite. The knife is slicing away at the nobles' grasp of the local economy which is manifested by their control over land; once irrigation has succeeded, their ownership of large areas of dryland is irrelevant because irrigation will be the principal source of farm income. Thus it is only the elite's livelihood which is threatened by SAED: the dispossessed view irrigation as their way out.

Reproduced from Bloch 1987a (with slight modifications)