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In Rural Mali

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There is general agreement that migration rises, both immediately and as a long-term response to the threat of recurrent droughts (Gregory, 1990; Silitshena, 1990; Wisner and Mbithi, 1974). If we look at the demographic trends for drought-prone regions of Sub-Saharan Africa there is evidence of long-term depopulation from the zones most severely affected by drought. In the Sahelian region, just after the great drought of 1968-74, there were marked population shifts from the zones bordering on the Sahara towards the cities of the region, where the population grew by 6-10% during this period. From all the Sahelian countries there is a net out-migration (Gervais, 1986; Ouedraogo, 1988).

As a long-term strategy, it is clearly preferable for the migrant to locate outside the drought-prone region, either on the African coast or in France or other European countries. The migration flows from Mali, one of the interior Sahelian countries, reflect this preference. By 1975, Malians accounted for 24% of the population of Ivory Coast, 22% of the population of Burkina Faso, and between 8 and 10% of the populations of Senegal and the Gambia. France, a particularly popular destination for emigrants, registered 35,000 Malian immigrants in 1975, half of the immigrant African population (Diallo, 1981).

Many of Mali's drought-induced migrants ended up in the cities of the region (Sow, 1981; Colvin et al., 1981). While less favored than Dakar or Abidjan, which benefit from their coastal locations and higher levels of industrial development, Bamako, the capital city of Mali, received its share of drought migrants. Prior to 1966, Bamako grew at 4-6% per year, but during and just after the drought, the city grew by 10% per year (Diallo, 1981). The 1987 census showed that between 1976 and 1987 the population of Bamako grew at an average annual rate of 4.2% per year, 2.5 times faster than the growth rate for the rest of the country. An estimated 75,000 persons migrated to Bamako between 1976 and 1987 (Vaa, Findley, and Diallo, 1989).

Though widely assumed that drought migrants permanently leave their homes behind, recent studies cause us to question these assumptions. A 1981 survey conducted in France showed that the migrants average only a 7.7 year stay. They may return to visit two-three times during this period, but at the end, most return home permanently, leaving their "place" in France to a younger brother or cousin (Conde and Diagne, 1986: 89-90). Even among those going to local cities, not all the drought migrants are permanent migrants to the city. Recent surveys of domestics and of other women in low-income neighborhoods showed that at least some of the women plan to return to their home villages with their earnings (ISH, 1984; Vaa, Findley and Diallo, 1989). A 1975 survey conducted in the Senegal River Valley showed that after age 30 over half the male migrants return either seasonally or for good (Minvielle, 1986).

Using newly available survey data from a longitudinal 1982 and 1989 survey of migration in Mali's Senegal River Valley, this paper presents data showing the extent to which circular migration was adopted as a strategy for coping with the drought of 1983-85, a drought which involved just as much rain shortfall as the 1968-74 drought. The first part of the paper

outlines the circumstances under which families in this region might choose circular over permanent migration as part of their drought survival strategy. The second part of the paper presents data from the survey. After an introduction to the Senegal River Valley, the paper documents the rise in circulation during the drought. The third part of the paper presents the results from multivariate analyses, highlighting the difference in the ways that family and community factors affect circulation and more permanent migration. The paper concludes with some observations about how our models for development and drought-resistance could change to better accommodate the realities of circulation.

CIRCULATION AS A MECHANISM FOR COPING WITH DROUGHT

Most theoretical approaches to circulation focus on the role of circulation as a component of semi-proletarianisation. Circulation, or temporary migration of persons between rural and urban areas, enables families to deploy part of their labor in the urban labor markets, where jobs are available or better paid than in the rural area. Because wages in the urban area are not high enough to support a family, the migrant cannot bring the family to the city, so spouse and/or children stay in the rural area. The family members left behind continue to farm or engage in other rural labor, providing at least some of their own subsistence and creating a safety net should the migrant lose his or her job. This form of circulation is widespread in Latin America and Southeast Asia. (For a more extended discussion of circulation see Hugo, 1980; Standing, 1985 and Prothero and Chapman, 1985).

The model takes on slightly different formulations in the African context. In the context of South African apartheid and the mining economy (Mitchell, 1987; Murray, 1980), men circulate throughout their working lives, spending years working in the mines or cities, coming home only infrequently to visit their families. Despite their extended, seemingly perpetual absences, migration is viewed as a temporary expedient for accumulating enough money to marry, to buy cattle, or to achieve a series of limited economic goals. The men are little committed to the city or the mines and plan to return to their home villages.

In French West Africa, the area on which this study focuses, there are two forms of labor circulation, distinguished by their durations and their distance. The short-cycle pattern more closely resembles the Latin American/Asian pattern, while the long-cycle pattern is closer to the pattern found in Southern Africa.

In the short-cycle pattern, adolescents and young men, especially those with little or no education and coming from the more impoverished families, go to nearby cities where they work as petty traders, helpers, or in other low-status, low-wage jobs. The duration of stay is generally less than six months during the dry season, conforming to standard census definitions of a temporary absence. Studies from Niger, Burkina Faso, Togo, and Senegal show that these youth almost always stay for durations less than a year and return to help with the farm work (Barou, 1976; Remy, 1977; Finnegan, 1980; Amselle, 1978; Minvielle, 1986). Students attending college or university

in nearby cities follow a similar pattern. In addition, there is some evidence that women who migrate independently , for example to work as domestics, adopt this circulatory pattern (Hamer, 1981). The poorly developed road and transportation network in French West Africa argue against the type of weekly or monthly circulation that is found in Indonesia or other parts of Southeast Asia (Hugo, 1978), so most can return only once a year.

In contrast, the long-cycle pattern involves long duration, long distance circulation, usually to a foreign destination such as Gabon, Zaire, the Congo, or France. A large share of the so-called permanent migrations from this region are actually long-cycle circulations. In this case, the migrant may go for cycles of 2-3, or even 7, years, each cycle punctuated by a brief vacation so as not to lose his job. These long-cycle circulators usually have jobs in the formal or modern sector, where the migrant's status is stable and his salary fixed. Between visits, the migrant sends remittances home to his family, and upon his home visits generally brings large quantities of cash (Adams, 1982; Barou, 1976; Conde and Diagne, 1986; Finnegan, 1980; Coulibaly et al., 1980). In many respects this pattern is like the pattern often observed for Mexican migrants cycling back and forth between their rural villages and jobs in the United States. (For a discussion of the Mexican patterns see Mines, 1981; Dinerman, 1978).

What factors condition the choice among the two patterns? Clearly, if the agricultural situation is such that men do not have to return every year to help with farming, it is easier for the family to send someone in the long-cycle of migration overseas. As researchers have shown in Oceania and elsewhere in Asia, when men are not needed for regular cultivation tasks (Morauta, 1981; Forbes, 1981), they are encouraged to find jobs outside the village and to return only periodically. This is the case in parts of Africa, but not in the Senegal River Valley where men are responsible for cultivating the land. Normally they must return for this phase of the agricultural cycle (Minvielle, 1986). However, if the household is polygynous and/or extended, in return for a share of the cash remittances from the migrant, the migrant's kin will perform these jobs for him, leaving him free for the long-cycle circulations.

The other factor which shifts the odds towards the long-cycle circulation is the combined influence of persistently low (and declining) levels of agricultural output, a fairly high degree of instability in the production level from year to year, and/or little prospect for major increases in agricultural or non-agricultural income. In combination, these factors argue against extensive investment in the current production system and more investment of family resources in other production systems. Long-cycle migration is an important first step for families to take towards insertion in non-local market economies (Minvielle, 1986).

All evidence shows that the Senegal River Valley has low levels of agricultural productivity, highly variable crop yields, due to the recurrence of dry years when production falls precipitously, and little economic diversification (For additional details see the planning

documents prepared by the Operation de Mise en Valeur de Fleuve Senegal (OMVS, 1980) and by the Ministere National du Plan, Mali, 1985.) With so little potential available to the individual, long-cycle migration would be preferred to short-cycle migrations as a means to raise or stabilize family income.

The long-cycle migrations achieve this in three ways. First, the migrant can use savings to purchase tractors or improved ploughs, which increase yields, especially in dry years. Second, migrants can pool their savings to invest in a pump for irrigation or in other improvements necessary for irrigated agriculture. Where irrigation has already been established, the migrant may send money for the purchase of fuel, seeds, or other inputs to irrigated agriculture (Diemer and Van der Laan, 1987; Sow, 1991). Third, the migrant may use his savings to establish a new business, such as tailoring, grain trade, and so on. Finally, the family may shift to a "migrant economy", where the bulk of the income-generation is transferred to migrants no longer living in the Valley. In-depth surveys conducted in the Senegal River Valley in 1987 showed that migrants had used their savings in all four ways.

The most lucrative long-cycle migration involves cycles to France. However, to be successful, this long-cycle migration requires sizeable expenditures for transportation and for expenses incurred while looking for work, well over $1500, several times the annqal per capita income in Mali. This limits long-cycle, French migration to those with a large resource base upon which to draw: more contacts at the destination to help the migrant find a job or to provide shelter them until the migrant can support himself, more money with which to finance the journey, more education and job experience to widen employment possibilities. These migrations may take months, if not years, to launch.

Because of their long planning horizon, the long-cycle migrations are inappropriate as a spontaneous response to a drought-induced crop short-fall. Those who are already working overseas will be expected to intensify their remittances, but families may lack the resources, contacts, or even available labor force to suddenly ship one of their members to France. In fact, new migrations to France may decline during a drought period, as funds that would have gone to finance migration are diverted to more urgent food needs.

Thus, short-cycle labor circulation should rise during a drought. In addition, permanent migrations to destinations that do not require significant advance planning or investments also would rise during a drought, for example, to major African cities or regions less affected by the drought (e.g. central and coastal Africa).

Besides labor migrations, families may consider a broad range of other activities to help them cope with drought. Faced with repetitive drought and potential famine, the villagers are likely to have developed a whole range of mechanisms that will reduce their individual risk of famine. These include adopting famine resistant crops and practices, sale of livestock, exploiting other food types or sources, developing extensive

networks for sharing food (and food deficits), and interregional exchanges that bring food and money into the region (Scott, 1976; Silitshena, 1990; Wisner and Mbithi, 1974). Their choice among these options will depend on their own circumstances at the time of the drought, as well as the options that are available to them by virtue of their family structure and community resources. In South India, for example, drought survival strategies may range from encouraging daughters to marry into more distant families living in areas less likely to be affected by local droughts, sales of jewelry, reduction in food consumption, substitution of wild for purchased foods, or postponement of marriage ceremonies (Caldwell, Reddy and Caldwell, 1986).

In the Senegal River Valley, families can reduce their consumption by eating less, by eating more wild (and therefore free) foods or by purchasing less. Alternatively, they can reduce the number of persons eating food. In addition to labor migrations which simultaneously reduce the family's consumption (Garine, 1991), consumption can also be reduced sending members to other families, either permanently through marriage or temporarily as short-cycle circulators. Recipient families either will be more well-off or reside in zones spared that particular drought. Though this is not true for all of Mali, migrants from Kayes receive free room and board from their kin at the destination.

Consumption can be reduced by sending children to live in other families. Child migrations only take place under specialized conditions, namely sending the child for Koranic studies with a master in another village or fostering the child out to distant kin, even in the same village (For a discussion of Malian fostering customs see Findley and Diallo, 1988). These migrations or temporary transfers of children normally involve young children of between 5 and 7 years, with some children fostered permanently from the time they are weaned. For older children, urban destinations are preferred, so that the child also might benefit from opportunities to go to school, to become an apprentice, or to earn some money doing petty trade. Many of these older children fostered to urban destinations might not return if they became successful in launching an urban life. In any case, the circulation of children via fostering arrangements is likely to involve migrations of rather long durations. They might still be considered part of the natal household, but in fact they could be absent for years.

Women may also be encouraged to migrate in order to reduce consumption, but as with children, these migrations are unlikely to be viewed in that light. In 1987 we explicitly asked about the motives for female migration, and virtually none of the female migrations recorded in that survey listed explicit economic objectives. Likewise, the men in the villages reported that women would not be sent to cities to work, even in times of dire need, though they did admit to sending women to Bamako or other cities in order to buy food. Therefore, even if need and reduction of consumption are underlying factors, they are not likely to be named.

Most of women's migrations fall under the guise of visiting family or other social reasons such as participating in rituals. Even if they are

desperate to find some kind of work as a domestic or to establish themselves in some kind of trade, few will give an economic reason as their primary motive for migration. Yet, once in the city and settled in with kin, even distant kin such as cousins, the women may end up working with the other women in the household in their income generating activities. It is the more traditional villages that are likely to have higher numbers of women departing during the drought to "visit."

While kin feel obliged to receive any child as their own, there is no obligation to receive a woman. Since poor women are likely to have poor kin, it seems reasonable to expect that the poorest women would have fewer socially acceptable circulation options. Ironically, the women most likely to be extended a welcome are the women from more well-off families. Therefore, we expect that women circulating would be limited to the women from more well-off families. Their circulation during the drought would tend to weaken the negative effect of income on the probability of migrating.

Because of the need for extra men to be present in the household to provide their wives with access to land for cereal grains, only men in extended households, as polygynous households usually are, would have the extra men present to permit men to be absent for long periods. In addition, the several women could be available to help his wife cope with his absence. For both reasons, it is expected that polygynous households to have long-cycle migrants, while monogamous families would have short-cycle migrants.

As in many societies, the change of marital status often provides the occasion for a migration. In the Senegal River Valley, women move to the home of their husband shortly after marriage, and women who divorce or separate will return to their natal home. In addition, changes in marital status may occasion other socially acceptable migrations. Women wish to start a marriage with some personal savings, so they try to earn money prior to their marriage, leading to more circulation of women in the year of their marriage.

As for permanent migration, family and community characteristics are expected to affect the likelihood that at least one family member will circulate. As shown in Table 1, these include family structure, prior migration experience of the family and village community, agricultural production levels, income and economic development levels, drought severity, and socio-cultural attitudes.

If circulation is a stop-gap and temporary measure, it will be more likely in families with little previous migration experience and from villages where French migration had been at a lower level. We would expect more circulation from the non-Soninke families and villages, where the French migration connections are less well developed.

Circulation would also be more likely to be adopted in families and villages which normally have a sufficient food production or at least smaller annual food deficits. In this case, the families would be more

likely to have worked out production systems that allow them basically to stay in place. They will be less likely to have rejected local agriculture in favor of the migration economy of remittances. They would be able to make it through normal years and only need to resort to migration as a temporary expedient to meet the drought food shortfall. Thus, we expect that circulation will be higher for families with lower than average food deficits but sharp increases in the deficit during the drought years. In addition, circulation would be higher in the villages which did not have an irrigated perimeter which would allow production of the marginal extra food needed during the dry years.

As for long-cycle migration, we expect that communities with a higher level of economic development and a more diversified economy will have lower levels of circulation. Women, children, and men could engage in trade or other wage labor activities without migrating.

For all these reasons, during a drought we expect more short-cycle circulation. Circulators will involve young men with few connections or resources with which to launch a migration to France, as well as older married men with no extended kin to help with their farm responsibilities. It also will involve women and children, as part of the family's strategy to reduce its consumption. Most circulation will be short distance to nearby Malian or Sahelian destinations.

As shown in Table 1, the following family and community characteristics are expected to be associated with short-cycle circulation, as compared to long-cycle or permanent migration: fewer polygamous families, due to fewer women in the household to share the work in the absence of a long-cycle migrant, reduced effect of income due to the offsetting effects of better-off women migrating versus more low-income men, less importance of previous migrants from the family or village, smaller average cereal deficit and greater village food self-sufficiency, absence of income generating activities in the village, generally less severe or frequent droughts, and a greater traditionalism in roles and expectations.

THE DATA SOURCES

Pre- and post-drought observations of migration and related family and community characteristics are drawn from two surveys conducted in 1982 and again in 1989 after the 1983-85 drought. The surveys were conducted by CERPOD, the Centre d' Etudes et de la Recherche sur la Population pour le Developpement, Institut du Sahel, Bamako, Mali.

The original survey was undertaken jointly with the OECD Development Centre, and involved surveys in France and in the Senegal River Valley. The sample in the Valley represented areas named as places of origin by the migrants interviewed in the French portion of the study. In each of the 99 sampled villages questions were asked about community infrastructure, services, agricultural and economic activities. Interviews were conducted with a sample of village household heads about their household members and household resources. Detailed migration histories were collected for the returned migrants, and each household head was asked about basic

characteristics of members, their economic activities, and household-level economic characteristics. A sample of women from each household were asked their marital and childbearing histories. (For additional details on the sample design and the survey instruments, see Conde and Diagne, 1986:17-23 and the Annex). The baseline data for the characteristics of individuals, households, and villages are drawn from the Malian subsample of the 1982 survey, which included 39 villages, 327 households, and 4910 individuals.

The migration data come from the just completed 1989 Follow-up Migration Survey of the Senegal River Valley. All of the original households were re-interviewed, even if the household head or individual membership had changed. The 1989 survey encompassed 7263 individuals in 327 households. Interviews were conducted with each household head, who supplied the information on all members, including the migrants. Village elders were assembled and asked questions about the current and pre-drought village characteristics. Interviews also were conducted with all women over age 15, but these data are not used in this analysis.

The data from 1982 and 1989 were linked together by means of unique individual identifiers. After cleaning and elimination of cases where household level information was missing, the number of individuals and households remaining for the analyses was 7079 individuals and 309 households.

These quantitative data are supplemented by qualitative data collected in 1987 under CERPOD auspices. In-depth interviews conducted in 1987 with 71 families in seven of the 39 Malian villages in the original 1982 sample. The villages were chosen as being representative of villages in the sample which had aggregate proportions of temporary or permanent migrants significantly higher or lower than the 1982 average village level.

THE STUDY AREA

The Upper Senegal River Valley, stretching from Matam, Senegal to Diamou, Mali, is one of the more underdeveloped river regions of the western Sahel. Subject to enormous changes in water level between the dry and wet seasons, it has never supported a year-round river transportation network. In addition, most of its length passes through rough terrain unserved by railroad or adequate road service, and it remains largely inaccessible to the outside world. Although partially served by the Dakar-Niger rail line, the region has failed to generate a strong set of exports, and its economy remains basically a subsistence agro-pastoral economy (Min. du Plan; 1985; OMVS, 1980). Kayes, the regional capital of the Malian portion, remains little more than a local administrative and trade center.

Perhaps due to the lack of economic alternatives in the region, the Senegal River Valley has long been the source of African labor migrations. "Les gens du Fleuve", or people of the River, have been prominant among the "navetanes", the seasonal migrant labor working the colonial peanut plantations, but also to Dakar, Abidjan, and other major labor demand areas of West Africa (Adams, 1977). Since the late 1950's, many have gone to France where wages are substantially higher (Weigel, 1982; Conde & Diagne,

1986).

The dominant ethnic group of the area is the Soninke or Sarakolle, a strongly Islamic and rigidly paternal ethnic group. Among the Soninke, the families live as "grand families", which may include up to a 100 persons. The oldest male heads the household, which includes the families of each of his sons and their sons. Historically, the Soninke were the region's traders, but with the collapse of the arabic gum market, upon which this trade was based, the Soninke have become better known for their labor exchanges, especially in the French labor market.

Records of rainfall from the Kayes and Yelimane districts which comprise the sample area show respectively an average annual rainfall of 710.5 mm for the 1901-85 period and 513.8 mm for the 1936-85 period. There were substantial downward fluctuations in the rainfall during this period. In the Kayes subdistrict, the annual rainfall ranged from a high of 1127 mm to a low of 428 mm, while in the dryer Yelimane district the range was 976 mm to 316 mm. For both districts extremely low levels of precipitation were recorded for the late 1920s, early 1940s, 1968-73, and in 1983-85 (Sow, 1987).

The economy of the villages is basically subsistence agriculture: millet, sorghum, and corn. The average level of rainfall, around 600 mm / year, is sufficient only for extensive unirrigated agriculture. Yet, even maintaining this level of production is problematic in this zone, since rainfall is highly variable. For this reason, farmers traditionally build large granaries and ideally harvest enough for three years, as their own reserve against the inevitable dry years. Since the drought of 1968-74, however, rainfall has tended to be below average, and few farmers have been able to achieve this goal, let alone raise enough food to feed their families for one year. Yields in 1982 were low, less than 245 to 600 kg/hectare, (Min. du Plan, 1985), and in over half the villages the level of production was not sufficient to meet the needs of the village. According to the 1982 survey, families had to buy up to 40% of their food needs.

In most of the villages, cereal cultivation is complemented by pastoral activities. In 1982, 75% of all households kept some form of livestock. Cows dominated the pastoral activities, with an average of 23.7 heads/family. Their herds are too small to survive a severe drought as a viable herd (Silitshena, 1990), so most families use their livestock as a savings account. During dry years, animals are sold or exchanged for grain. Efforts are made to sell animals before they lose value through weight-loss associated with the drought.

During the 1983-85 period the average amount of rainfall was 428 mm in Kayes, 40% below the period average, and in Yelimane, the average was 407 mm, 21% below the period average (Sow, 1987). This drought had severe consequences for the level of food production and for animal husbandry. Since the interval between rains was 15-20 days, farmers had difficulty in getting any crops to grow. In 1983 cereal production in the Kayes region had dropped to one-third the pre-drought levels (Min. du Plan, 1985). In

this survey region, the average 1983-85 millet production was 415 kg, 55% below the level observed in 1989 during a good year.

The prolonged drought also reduced the forage available from 1286 to 310 kg/hectare by the 1983-84 season. The demands for forage were aggravated by the arrival of some 30,000 cattle from Mauritania, pushed further south than usual by the destruction of their local dry-season pasture (Sow, 1987). The 1989 survey showed that local herds were cut in half. During the drought each family saw lost an average of 4.5 cattle and another 5.4 were sold to allow the family to buy food. By 1989, average herd size was only 11.5 cows and 7.1 goats, indicating a shift away from cows to more drought resistant goats.

Such large and prolonged declines in food and livestock production during three consecutive years mean that the 1983-85 drought was not just severe; it was disastrous, according to standard classifications of drought (Gregory, 1990). Thus, most families should have turned to their preferred drought coping strategies to get through the hard times. Among these, short-cycle circulation should have figured prominantly.

RESULTS

The 1989 survey showed that families engaged in a variety of survival strategies during the drought. One of the most obvious shifts was towards purchased foods. As shown in Table 2, 90% of the families bought cereal during the drought, over twice the proportion who bought cereal according to the 1982 survey. A minority borrowed food from relatives, either in the village (14%) or further away (8%). In addition, 30% of the families obtained food directly from the government or local relief organizations.

There is little evidence that families substantially reduced their consumption. Only 25% said that they ate less, and even fewer, 15% of the families, said that they substituted wild herbs or roots for cultivated foods. Fewer than 20% reported that they reduced their expenditures for ceremonies or clothes.

The two major sources of funds for purchasing food were sale of livestock and migrant remittances. Almost two-thirds (61%) of the families sold livestock. Very few sold jewelry (13%), perhaps because very few had any jewelry to sell. Over 63% of the families depended in some way on remittances from family members who had already migrated. Most (47% of the families) received money from migrants already in France, but some (16%) received money from migrants elsewhere in Africa.

In addition, almost one-half the families (48%) said that members worked as casual laborers during the drought. Two-thirds of these families worked in other rural areas of Mali, some in nearby locations where migration was not required. One-third departed for Dakar, Abidjan, or another Sahelian city to find work.

Comparison of Pre-Drought and Drought Migration Patterns

Analysis of the migration histories for this period shows that even though families were heavily dependent on migration for surviving the drought, the aggregate level of migration did not rise. During the 1982-89 period, 1907 individuals, or 31% of the total sample population, reported at least one migration. If these migrations were equally distributed throughout the seven year period, we would expect 14% of the migrations to occur in each year, or 43% during the three drought years. In fact, 42% of the 1982-89, almost exactly the expected level of migration. Even allowing for the downward bias likely in these retrospective records, aggregate migration levels neither rose nor fell during the drought.

Although the level of migration continued unaltered, the pattern of migration changed. The marked increase in short-cycle circulation is documented by the figures in Table 3. In 1982, 25% of the migrants were short-cycle circulators, namely absent for less than six months and neither dead nor emigrated in 1989. In contrast, over two times that level, or 63% of 1983-85 migrants, were circulators during the drought.

As expected, the drought altered the patterns of dispersion adopted by migrants. As shown in Table 4, before the drought about half of all migrants went to France, and the remainder were split between Mali and other African destinations. During the drought, the dominant destination shifted to Mali, which accounted for 42% of the drought period migration destinations. This increase is significant at the .001 level (Chi-Square= 69.2).

As shown in Table 5, during the drought more children migrated. Before the drought, 17% of the migrants were children under the age of 15, but during the drought this proportion rose to 24%, an increase significant at the .001 level (Chi-Square= 26.7).

Women migrants accounted for 35% of all drought migrants, compared to 17% of all migrants before the drought. This increase in female migrants is highly significant, with a Chi-Square statistic of 33.8, at a probability level less than .001.

Now let us consider the stated reasons for these migrations. In considering these results it is important to recall that the reasons are given retrospectively by the head of household, and they are subject to errors both in reporting of motives between the migrant and the head of household and to re-interpretation of motives by the head of household at the date of the interview. It is likely that this re-interpretation would increase the proportion who were described as economic migrations if they succeeded in sending back food or money, while more would be described as family-related or social migrations if they failed to send back money. The reasons for migration for the 1982 versus the 1983-85 migrants are reported in Table 6.

Very few of the household heads reported drought or famine as the explicit reason for migration. This is consistent with the findings of the 1987 survey which also found that household heads described drought migrations as seeking work, not as fleeing drought.

As expected, there was a dramatic increase in migrations attributed to family and marriage, which, according to our theory, can be seen as socially acceptable reasons for encouraging members to leave the household in order to reduce consumption. In 1982, only one-fifth (19.4%) of the currently absent migrations were attributed to marriage or family reasons. During the drought years this proportion rose to one-half (49.6%). Compared to normal years, significantly more women migrated for reasons of marriage during the drought (Chi-Square = 54.5). This is consistent with the hypothesis that women would be encouraged to marry to reduce consumption.

Consistent with our expectations, there was an increase in child fostering during the drought. Among pre-drought migrations only 1.6% of the migrations were attributed to fostering, while during the drought this rose to 6.9% (Chi-Square = 1.97, significance only at the .16 level). in tabular form).

Surprisingly, the proportion of moves attributed to economic motives declined, falling from 48% to 25% of all reported motivations. As shown in Table 6, even if those for whom the motive was not specified were actually economically motivated, there would still be a drop in the proportion of economically motivated migrations.

These patterns are consistent with most of our expectations about changes to migration during the drought. There was a dramatic increase in short-cycle circulation. Many more children and women were involved in these circulations, and probably for this reason more of these migrations were to nearby destinations. There was a slight decline in the more costly, long-duration migration to France, but not enough to permit rejection of the null hypothesis of no change.

As expected, many more of the migrations were attributed to family reasons. Compared to the pre-drought period, there were proportionally more who migrated to "visit family" or for other social reasons during the drought, paralleling the increase in female migration. In addition, more children were sent to live with other families as foster children. There were less explicitly economically motivated migrations, since economic motives are not attributed to women or children, but not among men, for whom economic motivations continued to dominate.

The drop in the economically motivated migrations is associated with the shift towards greater female migration during the drought. As noted above, economic motivations are virtually never assigned to female migration. Since female migration comprised almost half of the 1983-85 migration, it is clear that the share of economic motives would decline. Among men, however, economic motives continued to account for about half of all migration motivations.

Comparison of the Short-Cycle and Long-Cycle Migrants

As shown in Table 7, there are fewer individual level differences between the short-cycle and long-cycle migrants than had been expected. Consistent with our expectations, the short-cycle migrants are younger on

average than the long-cycle migrants, but more are polygynously married. As expected there is a slight decline in their employment experience (fewer having a cash income), but there is an unexpected slight increase in their educational selectivity. Prior migration experience is virtually identical for both groups of migrants. The migration of more women does not appear to have changed the effect of poverty on circulation, since the short-cycle migrants are more likely to come from poor families than the long-cycle migrants.

The short-cycle drought migrants also show the marked rise in short-distance migration within Mali. Half (51%) of the short-cycle migrants stayed within Mali, and another quarter (24%) stayed within the African continent. In contrast among the long-cycle migrants 37% stayed within Mali or Africa.

Factors Associated with the Rise of Short-Cycle Circulation during the Drought

While individual characteristics appear to play little role in affecting the type of migration adopted during the drought, family and community factors play a very large role. This section of the paper presents the linear regression equations of the simultaneous effect of family and community structure on the numbers of all migrants from a family during the drought, as compared to the chance of short-cycle migrations instead of long-cycle migrations.

The expected direction of effect for each family and community factor on the choice of short versus long-cycle circulation were given in Table 1. The variable means and standard deviations are given in Table 10, below. With the exclusion of the individual level variables, controls have been added for the number of members over age 14 in 1982 and for the number earning cash income, both factors shown to be key discriminants for short versus long-cycle migrants.

Linear regressions were estimated to assess the relative contributions of each family and community factors to the variation in family migration patterns. As shown in Table 11, the first model is the aggregate model, namely to predict the variation in numbers of any kind of family migrations during the drought. The second model predicts the variation in the share of short-cycle migrants during the 1983-85 drought, as compared to total drought migrants. The number of families in these regressions is 327.

The model for any migration during the drought predicts 50% of the variation in the numbers of migrants in the family. As expected, the number of migrants from a family is greater if there are a larger number of adult members in the family, and also if the household is polygynous.

In general, there is little economic selectivity among the drought migrants. Families with more members working in the cash economy or in France did not have a significantly greater number of migrants. But there was an increase in experiential selectivity, with more migrants from families living in Soninke villages with their greater migration experience

and contacts.

As expected the drought migrants come from families which tend to have larger cereal deficits and who own fewer livestock which they might sell during the drought in order to purchase food. It had been expected, however, that more drought migrants would come from villages with a low degree of food self-sufficiency, but in fact families were more likely to send members out during the drought if the village generally was self-sufficient in food. But those sending migrants were not necessarily the worst off in the village: they tended to have higher than average per capita incomes, giving them more resources with which to finance long-cycle migrations. Further, the families with more migrants were not the ones most severely affected by the drought, as they were not selected for the families with the greatest livestock losses.

In previous studies it has been shown that the presence of small-scale irrigated perimeters does little to slow out-migration (Findley and Sow, 1990; Diemer and Van de Laan, 1982); these results show that even during the drought this is true. The families living in villages which had irrigated perimeters in 1982 were more likely to have larger numbers of migrants. As elsewhere, the migrants may have served a key role in bringing in the capital needed to keep the irrigation perimeter operational. Or, the irrigated lands may have provided the reserve needed to permit more men to leave on long-cycle migrations.

Development activities appear to have mixed effects on migration during the drought. While the presence of commercial activities does little to reduce general out-migration, development programs, such as those promoted by non-governmental organizations, do reduce migration during the drought. While it had been expected that traditionalism would have little effect on migration, it appears that drought migration is higher in the more traditional villages which have Koranic schools.

When compared to the family and community factors influencing all forms of migration during the drought, it was expected that there would be less selectivity for short-cycle migrants. The second model presented in Table 11 shows that short-cycle migrants are less selective in at least some of the hypothesized dimensions.

As expected, there is a decline in the importance of a large complement of adult members. Families are more likely to concentrate their migrations in short-cycles if they have a smaller number of adults present to maintain the household activities while the migrant is absent. Similarly, circulation is more likely in monogamous families, with fewer women to help out in the absence of the migrant.

Contrary to expectation, the short-cycle migrants do not come from the very poorest families. The short-cycle migrants are more likely to come from families where there already are some members earning cash income, as well as from families with a higher per capita income prior to the drought. Consistent with this positive income effect, the families of the short-cycle migrants have neither smaller nor larger cereal grain deficits.

The short-cycle migrants come from villages which are more food self-sufficient than those of the long-cycle migrants. Further, their villages are less likely to experience frequent, severe droughts. But at a family level, there is evidence that this particular drought severely affected the families with short-cycle migrants, as they were more likely to reported a large loss of livestock.

Compared to all migrants, families with short-cycle migrants are less positively selected for prior migration experience, as had been expected. But they still are likely to live in villages dominated by the Soninke ethnic group, with its extensive migration history, if not migration predilection. As among all drought migrants, development activities in the village reduce the share of short-cycle migrants. Showing their greater link to local earning opportunities among the short-cycle migrants, villages with some commercial activities are less likely to have large numbers of circulators per family. The presence of irrigated perimeters has no significant effect on the numbers of short-cycle migrants per family.

CONCLUSIONS AND POLICY IMPLICATIONS

Although the 1983-85 drought was serious, with the benefit of the river and wells drilled after the previous drought, most villages in the Kayes region of the Senegal River Valley could obtain water, hence very few families were forced to flee. Nonetheless, surveys conducted before and after the drought show that the drought had significant consequences for the region's families. During the drought, their average cereal production dropped by half, and livestock herds also were cut in half. Instead of needing to purchase only 40% of their food needs, families had to purchase 60% of their food needs. The majority of families depended on migration to get them through the drought. Some families depended on remittances from prior migrants, those already in France, Senegal, Ivory Coast, Gabon or elsewhere in Africa. Others depended on "new" migrants who left during the drought.

During the drought, the classical migration of long-duration and long-distance, especially to France, was expected to continue, but at a lower level. The 1982 survey showed that most of these so-called permanent migrations are in fact circular migrations, with returns only after several years. Therefore, we have classified these migrants as "long-cycle" circulations, whose expected duration is in the years, not months. It was expected that these long-cycle circulations would be dominated by men, coming from the better-off families and from families and villages already much experienced with French migrations.

The alternative migration form, the short-cycle circulation, would be for durations under a year, and generally less than six months, the standard threshold between temporary and permanent migrations. During drought years, we expected more "new" migrants to be short-cycle circulators, both to earn money for food and to reduce consumption demands. With fewer resources, migration contacts, and a greater need to return to help with seasonal farmwork, most short-cycle migrants were expected to stay within

Mali, if not the Kayes region. Women and children were expected to figure prominently in the short-cycle migrations to nearby cities and villages in Mali. Although many could earn money during these migrations, many more of these migrations would be encouraged simply to reduce the family's consumption levels. To legitimize this seemingly dishonorable sending away of women and children, the migrations would be rationalized as social visits or for family reasons.

A longitudinal, panel survey conducted before and after the drought provide the data needed to test this model. These data show that during the drought, the average rate of migration did not rise, perhaps because the rate of migration from this region is persistently high, with or without droughts. But the types of migration changed in the direction expected, shifting towards more short-cycle migrations to nearby Malian destinations. The classic male-dominated migration continued during the drought, but the drought precipitated the migration of many more women and children than normally migrate from this region.

The 1983-85 migrants were subdivided into long-cycle and short-cycle circulations. As expected, the long-cycle migrants are very similar to the pre-drought migrants: mostly male, older, Soninke ethnicity, married, with previous employment and migration experience, and coming from the better off families and villages. Over half of these long-cycle migrants migrated in search of work.

In contrast, the short-cycle circulation more than doubled during the drought. The short-cycle circulators are very different from the long-cycle migrants, and the differences are largely consistent with expectations. The short-cycle circulators include many more women and children. As expected, most of their migrations are attributed to social motives such as getting married, joining family members, or paying visits. Few of these short-cycle circulators had been employed or economically active prior to migrating, so it is unlikely that they would have been able to make substantial economic contributions other than the reduction in consumption.

Yet for their families, these reductions appear to have played a major role in drought survival. Their families were smaller, and their production drop was less than among the families of the long-cycle migrants, so that the departure of one or two persons may have significantly narrowed the gap between drought production and consumption.

Given the importance of these short-cycle migrations both numerically and strategically, more attention needs to be paid to programs or policies which make short-cycle migrations easier for the region's families. Instead of concentrating on the long-term goal of reducing total emigration from the region, programs should be established which help the region's families shift their strategies to ones based on short-cycle instead of long-cycle migrations. A second set of programs are needed which would strengthen the positive features of these migrations for the families' survival strategies. Finally, to the extent that specific programs are retained to reduce outmigration, they should be targetted specifically to the families most at-risk for circular migration, as it is this form of migration which is

most susceptible to programmatic influence. The regression results provide the basis for a few concrete policy recommendations.

First, because families with fewer adults are more likely to concentrate on short-cycle migrations, efforts to promote reduced fertility and family size will facilitate the shift from long- to short-cycle migrations. The secular trend away from polygamy also promotes a shift to short-cycle migration.

Second, the development of drought-resistant millet and sorghum varieties will affect migration choices. The resultant increase in cereal production may be enough to enable the families with smaller average food deficits, namely those likely to adopt short-cycle circulation during the drought, to produce enough during the dry years so that fewer members need to migrate. Priority should be given to villages and families without French migrants, as it is in these villages where the marginal difference may be enough to reduce migration during the drought. In the long-run, success at making villages self-sufficient in food grains will enable more migrants to shift from long to short-cycle migrants.

As much of the migration is aimed at balancing food consumption against supply, strategies should focus on stabilising food supply. In addition to the higher level of production made possible by drought-resistant varieties, efforts to build grain reserves are likely to have the most positive effect on stabilising population in the villages where short-cycle migration is more dominant. Existing irrigation projects need to be made functional, but more with a view to creating a system to maintain grain production during dry years and to build reserves in the normal years. In addition, deep wells drilled in these villages could enable the families to re-establish herds, thereby providing a substitute for short-cycle circulation.

Third, these results offer little encouragement for the development of small-scale irrigation as a way to reduce long-term emigration. However, the evidence suggests that the irrigation systems are part of the whole long-cycle migration pattern, perhaps playing a significant role in assuring the eventual return of the migrants. Regional planners could explore more ways to employ village labor in the irrigated perimeters so that the families with smaller average food deficits could find enough work to offset their need to circulate.

Fourth, much more work needs to be done to develop alternative ways to provide food to women and children during the drought. The families most at risk for short-cycle migrants could be specifically targetted for food relief. It is among these families that marginal additions through food relief might come closest to fulfilling food shortfalls, thereby reducing the need to migrate. In addition, relief organisations could find ways to take advantage of the migrants to help in distributing food. Instead of struggling with impossible roads and inefficient transport systems, in principle, a system could be developed whereby the women take the food back to their home villages. For example, it might be possible to distribute vouchers that women and children could use to purchase food in urban areas.

There are, of course, enormous possibilities for graft and corruption in such a system, so perhaps it could be arranged through small groups of families and merchants, much the way that French migrants arrange credits in Bamako so that families can obtain grain to take back to Kayes for their families.

Fifth, for the families and villages where long-cycle migrations dominate, it would be better to work with their system than against it. Their dominant Soninke ethnicity stresses migration, trade and family, and these dimensions should be incorporated into village development projects.

This means encouraging or at least not actively discouraging migration. Working closely with France and potential employers, efforts should be made to streamline the migration process, so less time is spent unemployed and waiting in Dakar. Entry and exit visa formalities should be revised to permit the migrant to return home at least every three years without fear of losing the re-entry visa, even if they stay home for more than six months. Currently the fear of losing their visas prolongs stays, preventing men from returning home either to visit or to stay while their sons return in their stead. More should be done to make the migrants economically competitive, namely improved education and technical training.

The government should facilitate the conversion of remittances into investments into productive activities, including the irrigation which is so linked to long-cycle migration and to the eventual return of the migrants. Reorganizations are needed to increase the productivity of the small-scale irrigation systems, both of cereal and non-cereal, cash crops. Planning is needed to develop the infrastructure to accommodate the increased production of cash vegetable crops.

Since in these villages, there is a higher level of income and remittance income, these are the places to institute new credit institutions and projects to diversify production. Given the tight ethnic bonds of the Soninke and their already demonstrated willingness to pool funds for village developments, this might be the region to institute self-policing Grameen Bank-type credit groups. The migrants need not only a more stable agriculture but also a diversified economy where they can find an economic niche upon their return. These opportunities, in turn, would enable more families to adopt short-cycle migrations during the drought, instead of being dependent on the long-cycle migrations.

Through the diversification of migration patterns during the drought, the families demonstrated their ability to bend fairly rigid social structures to the needs of the situation. They can be counted on to do this again in future droughts. The question remains whether the government and relief organizations also have the flexibility to see alternative ways of connecting people with food.

Table 1: Variables Differentiating Short and Long-Cycle Circulations

Concept: vs.Long	Variable:	Expected Direction of Effect: All Migrants	Short
Individual level:			
Gender constraints on economic migration	Sex (1=M,2=F)	-	ns.
Responsibilities of age	Age	-	ns.
Competitiveness in labor market	Primary schooling Has a cash income	+	-
Family responsibilities	Married	-	+
Migration experience	Previous migrations	+	ns.
Family level:			
Women to share workload	Polygynous household	+	-
Economic resources	Per capita income	+	ns.
Agricultural production	Cereal deficit	+	-
Possession of livestock	Livestock	ns.	-
Previous migrants	Family migration history	+	ns.
Severely affected by drought	Loss of livestock	+	+
Village level:			
Extensive migrant networks	Soninke village	+	ns.
Village food production	Village food output	-	+
Irrigation possibilities	Irrigation pump	+	-
Commercial activities	Commerce	ns.	-
Development projects	Development activities	ns.	-
Frequence of severe droughts	Drought	+	-
Strong traditionalism	Village Koranic school	ns.	+

Table 2: How Families Coped with the 1983-85 Drought, Rural Kayes

Activity	Per cent Adopting
Reduction of consumption	
Eat less	25%
Spend less for ceremonies	11%
Spend less for clothing	17%
Alternative food sources	
Collect wild herbs and roots	15%
Purchase cereals	90%
Borrow food from relatives	
In village	14%
Outside village	8%
Receive food aid from organizations	30%
Alternative local income sources	
Sale of livestock	61%
Sale of jewelry	13%
Circulation or casual labor	
In rural Mali	32%
To other Sahelian cities	16%
Dependent on remittances from migrants	
From migrants elsewhere in Africa	16%
From migrants in France	47%

Source: Enquête Renouvelée de Migration dans la Vallée du Fleuve Senegal, CERPOD, 1989.

Table 3: Distribution of Pre-drought and Drought Migration by Type

Type of Migration	1982		1983-85	
	Number	(Pct.)	Number	(Pct.)
Short-cycle circulator	222	(25%)	584	(63%)
Long-cycle circulator	560	(75%)	343	(37%)
TOTAL	782	(100%)	927	(100%)

Source: Enquête Renouvelée de Migration dans la Vallée du Fleuve Senegal, CERPOD, 1989.

Table 4: Comparison of 1982 and 1983-85 Migration Destinations

Destination	1982		1983-85	
Inside Mali	121	(22%)	376	(42%)
Other African destination	161	(29%)	177	(20%)
France	265	(47%)	234	(27%)
Other destination	14	(2%)	100	(11%)
TOTAL	561	(100%)	887	(100%)

Source: Enquête Renouvelée de Migration dans la Vallée du Fleuve Senegal, CERPOD, 1989. Statistics are reported only for migrants whose destinations were stated.

Table 5: Age-Sex Composition of 1982 and 1983-85 Migrant Population

Age Group	1982	1983-85
Child < 15 years in 1982	135 (17%)	222 (24%)
Adult 15+ years in 1982		
Female	131 (17%)	318 (34%)
Male	502 (64%)	367 (40%)
Subtotal, over age 15	633 (81%)	685 (74%)
Age not stated	20 (2%)	20 (2%)
TOTAL	782 (100%)	927 (100%)

Source: Enquête Renouvelée de Migration dans la Vallée du Fleuve Senegal, CERPOD, 1989.

Table 6: Reasons for Migration by Sex of Migrant, 1982 and 1983-85

Stated Primary Reason	1982		1983-85	
	Male	Female	Male	Female
Drought or famine	0 (0%)	0 (0%)	3 (0.6%)	0 (0%)
Marriage	0 (0%)	12 (6.2%)	1 (0.2%)	159 (37.8%)
Other family reason	43 (7.5%)	90 (46.5%)	77 (15.8%)	150 (35.6%)
Fostered	4 (0.7%)	9 (4.6%)	15 (3.1%)	48 (11.4%)
Studies or apprenticeship	23 (4.0%)	1 (0.5%)	49 (10.4%)	1 (0.2%)
Economic	364 (63.3%)	3 (1.5%)	227 (46.7%)	2 (0.4%)
Other	24 (4.2%)	9 (4.6%)	22 (4.5%)	12 (2.8%)
Returning migrant	17 (3.0%)	2 (1.0%)	23 (4.7%)	4 (0.9%)
Not stated	99 (17.3%)	68 (35.1%)	68 (14.0%)	46 (10.9%)
TOTAL	574 (100%)	194 (100%)	485 (100%)	422 (100%)

Source: Enquête Renouvelée de Migration dans la Vallée du Fleuve Senegal, CERPOD, 1989.

Table 7: Individual Characteristics of the Short and Long-cycle Migrants

Characteristic:	Permanent or Long-cycle	Circular or Short-cycle	Signif. Difference
Proportion female	48 %	45 %	n.s
Average age at move	22.2 yrs.	19.6 yrs.	***
Has been to primary school	10 %	12 %	n.s.
Earning cash income 1982	29 %	23 %	*
Married before move	14 %	17 %	n.s.
Polygynous family	63 %	53 %	**
Prior Migrations	0.3%	0.2%	n.s.
Proportion poorest status	38 %	44 %	*

The difference between the mean proportions was tested with F-statistics. The asterisks give the significance level of the F-statistic:
n.s. :not significant at a .05 level
* :significant at a .05 level
** :significant at a .01 level
*** :significant at a .001 level.

Source: Enquête Renouvelée de Migration dans la Vallée du Fleuve Senegal, CERPOD, 1989.

Table 8: Reasons for Short and Long-Cycle Migrations, 1983-85

Reason for Migration	Permanent or Long-cycle		Circular or Short-cycle	
Drought or famine	0	(0%)	3	(1%)
Marriage	88	(25%)	74	(13%)
Family or social	95	(27%)	207	(35%)
Studies or apprenticeship	23	(7%)	29	(5%)
Economic	112	(33%)	128	(22%)
Other noneconomic	3	(1%)	19	(3%)
Return migration	2	(1%)	25	(4%)
Not given	20	(6%)	99	(17%)
TOTAL	343	(100%)	584	(100%)

Source: Enquête Renouvelée de Migration dans la Vallée du Fleuve Senegal, CERPOD, 1989.

Table 9: Destinations of the 1983-85 Long and Short-cycle Migrants

Destinations	Permanent or Long-cycle		Circular or Short-cycle	
Within Mali	81	(24%)	295	(51%)
Other African	35	(10%)	142	(24%)
France	98	(28%)	136	(23%)
Other or Not known	129	(38%)	11	(2%)
TOTAL	343	(100%)	583	(100%)

Source: Enquête Renouvelée de Migration dans la Vallée du Fleuve Senegal, CERPOD, 1989.

Table 10: Characteristics of the Sample Population

Variable:	No.	Mean	Std. Dev.	Description
Gender	7079	1.510	.499	Male=1, Female=2
Age82	6921	16.815	18.480	Age in 1982
Primary	7079	.081	.274	Attended primary school=1
Earning	7079	.093	.290	Cash income source =1
Married	7079	.188	.390	Married =1
Prev_mig	6386	.031	.174	Migrated before 1982 =1
NoAdults	7079	7.640	7.878	No. members 15+ years
Fam_Cash	7054	1.576	2.150	No. members earning cash
FamPolyg	7054	.568	.495	Polygynous HH =1
PCInc82	5458	29.434	36.386	CFA per capita (000s)
FoodDfct	5260	52.422	103.009	Millet deficit (kg/capita)
Livestock	7028	.857	.349	Had a herd in 1982 =1
LostCows	6324	6.809	10.144	No. of cows lost '83-85
FrenchMig	5671	1.766	2.036	No. already French mig.
V_Soninke	7079	.643	.479	Village mainly Soninke =1
V_FoodSuf	7079	.536	.498	Village self-sufficient=1
V_Irrign	7079	.369	.482	Small-scale irrigation =1
Commerce	6607	.188	.391	Commercial activities =1
DevtActiv	7079	.169	.375	Development projects =1
Drought	7079	.738	.439	Severe droughts often =1
Koranic	7079	.602	.489	Village Koranic school =1
Migration Variables				
Migrant82	7079	.111	.313	Migrant in 1982
Mig8385	7079	.104	.305	Migrant betw. 1983-85
Short8385	7079	.082	.275	Short-cycle drought mig.
Long8385	7079	.048	.215	Long-cycle drought mig.
FamMig85	7079	1.77	2.20	No. fam. migrants 1983-85
FamShort	7079	1.34	1.75	No. short-cycle migs.
FamLong	7079	0.85	1.40	No. long-cycle migs.
PctShort	4444	0.77	0.68	Pct. short-cycle migs.

All independent variables except LostCows are for 1982, prior to the 1983-85 drought. At the time of the survey the conversion was 300 CFA/dollar.
Source: Enquête Renouvelée de Migration dans la Vallée du Fleuve Senegal, CERPOD, 1989. and the Enquete de Migration dans la Vallee du Fleuve Senegal, 1982.

Table 11: Estimated Regression Coefficients for Drought Migration Patterns among Kayes, Mali families

Variable:	Model 1: Family migrants 1983-85 R^2 = .504 Coefficient	(t)	Model 2: Short-cycle share of 1983-85 Migrants R^2 = .123 Coefficient	(t)
No. of Adults	.1969	(43.24)	-.0062	(-3.00)
No. of earners	.0014	(0.10)	.0666	(9.32)
Polygynous HH	.1211	(2.29)	-.0954	(-3.52)
Income p.c.	.0009	(10.52)	.0001	(4.28)
Food Deficit	.0021	(9.54)	.0000	(0.06)
Livestock Owned	-.1305	(-1.90)	.0181	(0.49)
Cows Lost	.0007	(0.24)	.0101	(6.76)
Family Migrant	-.0195	(-1.37)	-.0286	(-4.02)
Soninke Village	.5212	(8.62)	.1088	(3.32)
Vill.food suff.	.4532	(7.59)	.2140	(6.93)
Irrigation sys.	.2420	(4.08)	-.0077	(-0.25)
Vill commerce	.0654	(0.89)	-.2029	(-5.59)
Devt. Progs.	-.4114	(-5.17)	-.3337	(-7.58)
Drought Often	.1798	(2.97)	-.0193	(-0.61)
Koranic School	.5150	(8.44)	-.0330	(-0.99)
Constant	-1.060	(-9.94)	.5977	(9.99)

Bibliography:

Adams, Adrian. LE LONG VOYAGE DES GENS DU FLEUVE. Paris: Francois Maspero, 1977.

Amselle, Jean-Loup. "Migration et société néotraditionnelle: Le cas des Bambara du Jitumu (Mali)." CAHIERS D'ETUDES AFRICAINES. 18(Pt. 4) (72), 1978: 487-502.

Barou, Jacques. "L'émigration dans un village du Niger." CAHIERS D'ETUDES AFRICAINES, 16, 3, 1976: 627-632.

Caldwell, John C. and Pat Caldwell. "Famine in Africa." Presented at the Seminar on Mortality and Society in Sub-Saharan Africa. Sponsored by the International Union for the Scientific Study of Population, Yaounde, Cameroun, 1984.

Caldwell, John C., P.H. Reddy, and Pat Caldwell. "Periodic high risk as a cause of fertility decline in a changing rural environment: Survival strategies in the 1980-1983 South Indian drought," ECONOMIC DEVELOPMENT AND CULTURAL CHANGE, 34(4), July 1986, 675-701.Colvin, Lucie Gallistel et al. THE UPROOTED OF THE WESTERN SAHEL. New York: Praeger, 1981.

Condé, Julien & Papa Syr Diagne . SOUTH-NORTH INTERNATIONAL MIGRATIONS: A CASE STUDY OF MALIAN, MAURITANIAN AND SENEGALESE MIGRANTS FROM SENEGAL RIVER VALLEY TO FRANCE. In collaboration with N.G. Ouaidou, K. Boye & A. Kader. Development Centre Papers. Paris: OECD, 1986.

Coulibaly, Sidiki, Joel Gregory, and Victor Piché. LES MIGRATIONS VOLTAIQUES: IMPORTANCE ET AMBIVALENCE DE LA MIGRATION VOLTAIQUE. (TOME I). Centre Voltaique de la Recherche Scientifique and Institut National de la Demographie. Printed by IDRC, Ottawa, Canada, 1980.

Diallo, Yacine Marius. "Les conséquences de la sécheresse sur les migrations dans les pays du Sahel: L'exemple du Mali." Proceedings of the International Union for the Scientific Study of Population, Manila, 1981, vol. 3. Liège: Ordina Editions. 1981.

Diemer, Geert and Ellen Ch. W. van der Laan. (1987). L'IRRIGATION AU SAHEL: LA CRISE DES PERIMETRES IRRIGUES ET LA VOIE HAALPULAAR. Paris: Karthala.

Findley, Sally and Assitan Diallo. "Foster children: Links between urban and rural families." PROCEEDINGS OF THE AFRICAN POPULATION CONFERENCE.Vol. 2, Liege: International Union for the Scientific Study of Population, 1988.

Finnegan, Gregory A. "Employment opportunity and migration among the Mossi of Upper Volta." RESEARCH IN ECONOMIC ANTHROPOLOGY. Vol. 3, Greenwich, Conn.: JAI Press, 1980.

Garine, Igor de. "Facteurs socio-cuturels et saisonnalité dans l'alimentation: L'exemple de deux populations du Tchad et du Cameroun (Massa-Moussey). LES CHANGEMENTS DES HABITUDES ET DES POLITIQUES ALIMENTAIRES EN AFRIQUE: ASPECTS DES SCIENCES HUMAINES, NATURELLES ET SOCIALES. Igor de Garine, ed. Paris: CISS,CIPSH,CIUS, 1991.

Gervais, Raymond. "Pour une problématique démographique des catastrophes dites naturelles: L'exemple du Niger 1969-74." DEMOGRAPHIE ET SOUS-DEVELOPPEMENT DANS LE TIERS-MONDE. D. Gauvreau, J. Gregory, M. Kempeneers, and V. Piche, eds. Centre for Developing Area Studies Monograph Series No. 21, McGill University, Montreal, 1987.

Gregory, Joel. "Drought comparative views from Timbuktu." DROUGHT

IN AFRICA: PROCEEDINGS OF A WORKSHOP HELD IN TIMBUKTU, MALE, 24-28 NOVEMBER 1986. IDRC-MRC277e,f. Ottawa: IDRC, 1990.
Hamer, Alice. "Diola women and migration: A case study." THE UPROOTED OF THE WESTERN SAHEL. Colvin, Lucie Gallistel et al., eds. New York: Praeger, 1981.
Hugo, Graeme. "New conceptual approaches to migration in the context of urbanization: A discussion based on Indonesian experience." POPULATION MOVEMENTS: THEIR FORMS AND FUNCTIONS IN URBANIZATION AND DEVELOPMENT. IUSSP Seminar on Territorial Mobility. Peter A. Morrison, ed. Liège:Ordina Editions, 1980.
ISH (Institut des Sciences Humaines). "Exode des femmes du Mali: Main-d'oeuvre domestique féminine à Bamako et Ségou." Bamako, 1984.
Ministere du Plan. DIAGNOSTIC DE LA REGION DE KAYES. Comité Régional de Developpement, Kayes: Republique du Mali, Min. du Plan, 1985.
Minvielle, Jean-Paul. PAYSANS MIGRANTS DU FOUTA TORO: LA VALLEE DU SENEGAL. Travaux et Documents No. 191, Editions de l'ORSTOM, Paris: ORSTOM, 1985.
OMVS (Organisation pour la Mise en Valeur du Fleuve Sénégal). ETUDE SOCIO-ECONOMIQUE DU BASSIN DU FLEUVE SENEGAL. Dakar/Saint Louis:OMVS, 1980.
Ouédraogo, Dieudonne. "Sécheresse et Population." Presented at the Conférence des Planificateurs et des Démographes CEA, Addis-Ababa, March 1988.
PUM (Projet Urbain du Mali). ETUDE DE DEVELOPPEMENT URBAIN DE BAMAKO: PROGRAMMATION DECENNALE DES INVESTISSEMENTS. Bamako. Rapport Phase 1. Ministère de l'Intérieur, Republique du Mali, 1984.
Prothero, R. Mansell and Murray Chapman, eds. CIRCULATION IN THIRD WORLD COUNTRIES. London: Routledge and Kegan Paul, 1985.
Rémy, Gérard. "Mobilité géographique et immobilisme social: Un exemple Voltaique." REVUE TIERS-MONDE. 18(71), July- Sept. 1977: 617-653.
Silitshena, R.M.K. "Social science research on drought in Botswana, Lesotho and Swaziland: A state-of-the-art review." DROUGHT IN AFRICA: PROCEEDINGS OF A WORKSHOP HELD IN TIMBUKTU, MALE, 24-28 NOVEMBER 1986. IDRC-MRC277e,f. Ottawa: IDRC, 1990.
Sow, Salif. LES CONSEQUENCES ECONOMIQUES ET HUMAINES DE LA SECHERESSE (1983-1985) DANS LA ZONE KAYES NORD. Unpublished Masters Thesis, Ecole Normale Supérieure, Bamako, Mali, 1987.
Sow, Salif. "Contribution à l'étude de l'interférence entre migration et irrigation dans le haut bassin du Fleuve Senegal, Cercle de Kayes." Unpublished working paper, FEWS Project, USAID, Bamako, Mali.
Standing, Guy, ed. LABOUR CIRCULATION AND THE LABOUR PROCESS. London: Croom Helm, 1985.
Vaa, Mariken, Findley, Sally E. and Assitan Diallo. "The gift economy: A study of women migrants' survival strategies in a low-income Bamako neighborhood." LABOUR, CAPITAL AND SOCIETY. 22(2), November, 1989: 234-260.
Weigel, J.-Y. MIGRATION ET PRODUCTION DOMESTIQUE DES SONINKE DU SENEGAL. Travaux et Documents de l'ORSTOM No. 146. Paris: ORSTOM, 1982.
Wisner, B. and Mbithi, P. "Drought in Eastern Kenya: Nutritional status and farmer activity." NATURAL HAZARDS: LOCAL, NATIONAL, GLOBAL. G.F. White, ed. New York: NYU Press, 1974.