BIBLIOGRAPHIC DATA SHEET	1. CONTROL NUMBER	2. SUBJECT CLASSIFICATION (695)
	PN-AAJ-635	D200-0000-G100

3. TITLE AND SUBTITLE (240)
The local-level dynamics of development in the Sahelian states

4. PERSONAL AUTHORS (100)
Quimby, L. G.

5. CORPORATE AUTHORS (101)
Development Alternatives, Inc.

6. DOCUMENT DATE (110)	7. NUMBER OF PAGES (120)	8. ARC NUMBER (170)
1977	121p.	AFR301.24.Q6

9. REFERENCE ORGANIZATION (130)
Dev. Alts.

10. SUPPLEMENTARY NOTES (500)

11. ABSTRACT (950)

12. DESCRIPTORS (920)
West Africa
Sahel
Localized conditions
Dynamics
Development strategy
Agricultural development
Rural sociology
Community development
Policies
Participation
Small farmers
Project analysis
Self help
Success
Resources

13. PROJECT NUMBER (150)

14. CONTRACT NO.(140)
AID/afr-C-1286

15. CONTRACT TYPE (140)

16. TYPE OF DOCUMENT (160)

AID 590-7 (10-79)

THE LOCAL-LEVEL DYNAMICS OF DEVELOPMENT IN THE SAHELIAN STATES

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Prepared for the Agency for
International Development Under
AID Contract Number AID/afr-C-1286
July 1977

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INTRODUCTION

Human resources are of a profoundly different order of being from the other kinds of resources essential to development—livestock, soils, water, infrastructure, technology, and the like. Sometimes, for convenience, for purposes of argument, or in an attempt to predict behavior under certain conditions, one constructs models of human interaction. Because of the human capacities for thought, decision-making, social interaction and creative innovation, these models must be considerably less accurate and certain than one's knowledge of non-human resources.

The effects of intervention in human situations develop according to very different dynamics from the effects of intervention in other kinds of systems. If you fertilize a field the results depend upon factors such as the soil, the amount of subsequent rainfall, and the crops planted. What the field thinks of being fertilized, how it felt about the implements used, are nonsensical considerations. Not so when one is attempting to change the behavior of human beings.

Research indicates that active local participation in the planning process is an essential element in successful development projects. Development Alternatives Inc. surveyed thirty-six development projects in Africa and Latin

America in order to determine which characteristics seemed most consistently associated with project success. They defined four criteria of success: "(1) the project's income to cost ratio, (2) the acquisition of agricultural knowledge by small farmers, (3) the increase in self-help capabilities as a result of project activities, and (4) the chances of project benefits to small farmers becoming self-sustaining." They found that "small farmer involvement in project decision-making and his resource commitment to the project accounted for nearly fifty percent of the differences in success scores of the projects."[1] Uma Lele's The Design of Rural Development, Lessons from Africa also stresses the importance of active community participation in project planning rather than paternalistic directives from the agencies involved.[2]

Examples from Mali and Senegal illustrate the negative effects of a paternalistic approach. Hopkins has described the response to government development directives in the village of Kita in Mali as "surface conformity and underlying apathy." When the Keita government tried to convince villagers that they should behave in the ideologically correct manner, many villagers simply adopted the path of least resistance and did not transform their agricultural production in the way the government had intended.[3] Schumacher's analysis of the failure of cooperatives in Senegal points to the lack of power,

authority, and even information, of Senegalese peasants. Faced with an inadequate but sometimes cruelly coercive extension service, a corrupt bureaucracy, and the lack of any real vehicle for political self-expression, the peasants became increasingly passive and suspicious. Perpetuating a vicious circle, the agricultural extension agents became increasingly disdainful of the farmers' abilities.[4]

Out of the interaction between farmers and development personnel new social patterns evolve. These may be patterns which reflect the farmers' enhanced capacities—both productive and social, or they can, perhaps even more easily, be patterns which include the cynicism, withdrawal, and defensive opportunism of farmers on the one hand, and the paternalism, disdain, impatience, and lack of curiosity of development personnel on the other. AID has recognized that development is a social, as well as technological process by requiring Social Soundness Analyses. The guidelines state:

> A central substantive concept of AID policy is the need to assure the wide and significant participation of the poor in the development process. In this sense, "participation" means not only sharing the economic benefits and contribution of resources but also involvement in the processes of problem identification and solution, sub-project selection and design, implementation and evaluation. The participation approach to development demands that AID project designers and implementors have a much deeper understanding of the sociocultural setting of projects than has been required in the past.[5]

To some extent the sociocultural understanding required

for project planning can be acquired with the aid of scholarly research, either already published or requested and funded in specific areas. At a certain point, however, written information cannot substitute for the direct experience of individuals who are sensitive to the issues involved. Each project setting has its own unique milieu and challenges.

The paper which follows discusses the social and cultural issues involved in the local-level planning and implementation of agricultural development projects in the Sahelian states. It focuses upon a "farmer's-eye view" of the development process. It makes no pretense of being exhaustive in either its enumeration or discussion of the issues involved—such an aim is beyond the scope of this project and would require a veritable encyclopedia for its fulfillment. I have tried simply to indicate the most important points for consideration and to give some idea of the areas in which further scholarly research could most profitably be done.

I have organized my presentation around the general issue of labor—who controls it, who benefits from it, how people make decisions about its application to this task or that. Local-level development in this region cannot take place without an increase in agricultural productivity. In theory, there are two ways of achieving this increase. The first is to augment the number of hours worked in agricultural

labor. Observers have noted that the average number of man-hours per year which active farmers actually spend in farm labor is only about a thousand in Africa, much less than the three thousand hours per year put in by farmers in some Asian countries. The African farmer is apparently underemployed. If one looks, however, at the seasonal pattern of labor, one finds a series of "bottlenecks" during periods of the rainy growing season—at the time of clearing the fields and planting, when weeding becomes necessary, and during the harvest. During the dry season crops can be grown only in the very few irrigated areas; most farmers have no opportunities for agricultural labor and spend their time in crafts, mending houses and granaries, migrating to other areas, and the like. In spite of the apparent underutilization of labor, most farmers appear to be contributing maximum labor at the crucial periods.[6]

To increase productivity during these bottleneck periods one must find ways to increase the productivity of the labor itself. One can introduce higher-yield crops, fertilizers, better methods of planting, weeding, and harvesting, and various mechanical aids. One can improve the water supply, and change the agricultural timetable. One can improve nutrition so that farmers are able to work harder during periods of peak labor demand. Farmers will adopt or reject these innovations on the basis of economic, technological, social, and cultural judgments.

The AID Social Soundness Analysis requires not only an understanding of local-level society and culture, but also a demonstration that the indigenous project participants agree that intervention based upon that understanding produces beneficial results. The proof of the accuracy of project planners' knowledge is in the local-level participation and support they elicit. One method of acquiring such knowledge is through a thorough examination of all the elements which determine people's allocation of labor resources, and the social consequences which flow from those decisions. Any attempt to change the productive patterns of agricultural populations needs to be based upon a clear understanding of their current production priorities and organization. One must understand how market opportunities, other economic pressures, ecological constraints, available technology and practical knowledge, and social organization and cultural values interrelate to guide the farmer to existing productive patterns. This interrelationship is very complex. Which of these factors appears to determine a people's response in any given instance may be as much a function of the observer's mind-set as of the actual dynamics of the situation. A comprehensive understanding thus requires some flexibility of viewpoint.

A note on language. The agricultural work force in the Sahelian states includes people of both sexes. For stylistic reasons I will use the pronouns "he, him, himself,

his," unless I am referring only to women. The masculine pronouns therefore refer to both sexes unless otherwise specified in the text.

Economic Incentives

The degree of influence which market prices will exert in any given situation is unclear. Some authors have argued that within the limitations imposed by ecological conditions, the market is the overriding determinant of farmers' labor allocation. They claim that given sufficient price incentives farmers will change their food preferences, rearrange their sexual division of labor, adopt new technology and new crops, and change other elements of their social organization of production.[7] If this were true, development could be induced nearly entirely by the regulation of prices and no other study of society or culture would be necessary.

In fact, the whole issue of the relationship of production to the market is very complex and not very well researched, at least not among the Sahelian state societies. Certain economic facts are obvious, although sometimes overlooked in project planning. In the absence of other sources of income, farmers can afford to pay for equipment and fertilizer and seed only a portion of what they gain from selling the crop. The market price for millet, for example, may be so low that farmers cannot afford to use chemical fertilizers, weedkillers, pesticides and animal

drawn equipment, even though all of these would increase the yield per hour of labor. Beyond the obvious book-keeping, other issues arise.

How important are strictly economic profits as opposed to other values in each culture? What has been the farmers' experience of cash cropping or livestock raising and involvement in the market? How is this likely to affect their behavior? What have been the social and ecological consequences of integration into the market economy?

A society's historical experience and cultural attitudes in many spheres influence its people's susceptibility to strictly economic motivation. Religious attitudes towards the soil, towards certain crops or animals, and towards interpersonal relations are obviously important. So are attitudes towards personal achievement and competition, sources of prestige within one's community, and accepted patterns of mutual support. Societies which have a strong military tradition, and lived either off the labor of slaves or upon the tribute of conquered populations may have a less intense tie to the land, a weaker commitment to the maintenance of soil resources, a greater responsiveness to short-term economic gain for individuals or nuclear families, and a greater tendency to migrate when conditions become difficult. The Wolof in Senegal are a good example. Societies which were less militaristic seem to have

developed more intense agricultural traditions and demonstrate more religious involvement in agricultural practices, including the conservation of agricultural resources. Examples of such societies are the Serer and the Dogon.

The Wolof and the Serer have experienced nearly identical ecological constraints and economic opportunities, yet they have tended to react in rather different ways. Both peoples inhabit Senegal's "peanut basin," an area of light, sandy soils and low rainfall (400-800mm/year), connected to coastal ports by a number of railway lines built in the first half of this century. The Wolof grow most of Senegal's peanut crop, the mainstay of her export economy. They began exporting peanuts in the mid nineteenth century and expanded the area under cultivation very aggressively, moving to the north and east. Their treatment of the soil, though very efficient in achieving a maximum return per labor hour invested, has horrified observers for several decades. In their haste to clear the land they burn off the groundcover leaving the soil exposed to wind erosion.[8]

The channeling of Wolof energies into peanut growing appears to result from their historical experience in the early part of the twentieth century and the late nineteenth century. Up until their colonization by the French the Wolof had been a very militaristic and expansionist society.

The tyeddo, or crown slaves, became a powerful military class who lived on booty and forced payments from the peasant population. Their activities fostered a kind of insecurity in the countryside which was inimical to the development of agricultural production. The peasants sought to defend themselves by allying with the serigne or Muslim clerics. Because the Wolof probably all thought of themselves as Muslim in one way or another, they maintained no particular religious connection to the land they worked.[9]

French conquest forced the Wolof to redirect their energies. The French displaced the nobles and the tyeddo, and tried to use the clerics (whom they called marabouts) as agents of social control. Many of the clerics cooperated, some maintained a kind of underground resistance, and some turned to religious inspiration for the creation of new social forms. One such innovator was Amadou Bamba who gathered a large following and founded the Mouride brotherhood. He taught that work for the brotherhood leaders, or shaikhs, was a means of assuring that one would enter heaven in the afterlife. Led by these shaikhs, and supported by religious fervor and the organizational strength of the brotherhood the displaced tyeddo, freed slaves, and other dislocated Wolof established new settlements in the vacant areas of Cayor and Saloum and along the extremely inhospitable edge of the Ferlo desert. Millet cultivation gave way to a tremendous expansion of peanuts

which brought a higher price on the market. Denied a military outlet for their competitive energies, organized by their shaikhs, and unguided by any developed agricultural tradition, the Mourides showed themselves extremely responsive to market stimuli.[10]

By contrast with the restless, expansive, and exploitative orientation of Wolof Mouride agriculture, the Serer have maintained a far more settled and conservative approach. Historically, they had no expansionist ambitions and effectively limited the size and influence of the military classes. The relationship with the land and its fertility were central concerns of Serer religious belief. Serer cosmology depicts the earth as a living woman, named Coumba N'Diaye. Her body is inhabited by ancestral spirits as well as human beings. The Serer observe rituals to maintain her fertility at the time of the planting and harvesting of millet. The head of the family unit acts as earth priest. Sacrifices of cattle enable the Serer to communicate with the spirits of the ancestors. The Serer also use cattle very methodically to maintain soil fertility and, through a complex system of gifts and loans, to weave together a social fabric of mutual interdependence. Colonial conquest did not uproot and dislocate a large class of Serer; the changes made themselves felt more slowly.

For a long time during the colonial period and into the 1960s the Serer gave the peanut crop a position of minor

importance. Peanuts were a woman's crop, grown in a wife's own individual field after she had completed all the necessary labor in the common family millet and sorghum fields. Even after peanuts spread into the family fields, in most areas until the last decade they took second place to millet.[11]

A number of factors contributed to the spread of peanut cultivation among the Serer. The imposition of taxes made some cash crop production a necessity. The Wolof modeled for the Serer an Islamic life style, and an increasingly fashionable "modernity," achievable by growing cash crops and buying machine-made clothes and cloth, enamel basins, bicycles, transistor radios, and the whole range of small manufactured goods available at local shops. Local merchants gave out credit and insisted on repayment in either cash or peanuts. The initiation training for boys entering manhood became more attenuated, and with it the religious valuing of millet, cattle, and soil conservation. Even with all of these influences, the Serer probably still grow more of their own food, in the form of millet, than do the Wolof.[12]

The comparison of these two peoples illustrates how economic incentives are but one among many factors influencing people's decision to grow cash crops. Social habits, cultural values, religious beliefs, and the range of life opportunities which people see for themselves also shape

their behavior.

Those who argue that development is and has been simply a result of farmers attempting to better their condition by responding to price incentives also overlook several aspects of the economic life of peoples in the Sahelian states. Production for the market has unfortunately not always been a voluntary response to the possibility of accumulating wealth or purchasing consumer goods. The colonial governments imposed taxes in order to force peasants to produce for the market to feed the colonial economy. Current governments also depend upon personal taxes for a substantial portion of their revenue, though attempts to collect taxes were suspended in some areas during the drought. Some farmers have become so indebted to merchants who will accept payment in only one crop that they no longer have much choice in what they plant. This is true, for example, in many parts of Senegal's "peanut basin;" merchants may lend the peasant miller to get him through the "hungry period" before the harvest, but they will accept only peanuts (or cash) as payment.

Little information is available on how farmers themselves view their participation in the current market economies in their areas. Do they feel coerced? Do they resent their relationship to the market? What are their dominant feelings about local merchants and creditors? If they feel trapped, what effect is this likely to have on

their output?

One study done in Senegal suggests that where farmers must sell their crops through cooperatives which they know to be corrupt and which they suspect of cheating them, this takes its toll in productivity. Peanut production in Senegal has fallen from a high of 828,000 tons per year in 1961-65, to 795,000 tons per year in 1965-69 to 548,000 tons per year in 1969-73. In part this is obviously a result of insufficient rainfall. In part it reflects the fact that falling prices and increased taxation halved the revenue going to producers between 1966 and 1971. This decline in production is also a manifestation of a very thoroughgoing peasant discontent and alienation from the government sponsored "cooperative" development and marketing system. Senegalese farmers have withdrawn from rural development programs, intensified their purposive noncompliance with administrative laws and regulations, shifted from peanuts to food crops for their own consumption, illegally crushed peanuts to produce oil for their own use, smuggled, defaulted on their loans, and stopped buying fertilizer for their crops.[13]

Even if the dominant experience had not been one of disillusionment with corrupt and dishonest marketing personnel, the impersonal nature of state-regulated prices can affect farmers' outlook. A study in the Majya Valley in Niger, a Hausa area, claims that when Hausa farmers sell

cotton to the C.F.D.T. buyer, with whom they have no other social, contacts, they feel uncomfortably dependent upon an anonymous organism they don't understand.[14]

Another study done in the Hausa village of Maradi in Niger discussed the villagers' rejection of farming as an economically viable activity. Before the colonial period Maradi thrived as an exporter of millet to the Tuareg in the north. They exported only the surplus, after first filling their own graneries with a two-year supply and setting aside enough seed for two years. Able to sell their surplus production of their own food crop, they had a certain independence from the market and did not risk starvation if market prices dropped.

During the colonial period, the French successfully encouraged peanut production. The Hausa then found themselves trapped between falling peanut prices and rising taxes and prices on goods coming into the village. They are also more vulnerable to drought, for although they still grow enough millet to feed themselves in good years, they do not grow enough of a surplus to fall back on in bad years. Some farmers become so indebted that they have to sell both peanuts and millet at harvest time and then hire themselves out to get through the next rainy season—which prevents them from growing enough food for themselves for the year after. The extended family, which used to be able to provide for its members, has fallen victim to the disintegrative

forces of a cash economy, to be discussed later in this study.

The Hausa in Maradi argue that nobody can make money farming, and they reserve both their entrepreneurial energies and their spare cash, when they have any, for commerce rather than agriculture. If a successful merchant also farms he does so not to make money but to employ and feed his clients, for a large following brings him prestige in the community.[15]

Observers in several Sahelian state societies have commented on how money seems to flow through the hands of farmers without actually enriching them. Cash enters the community through the sale of cash crops. It circulates a little among community members in the form of bridewealth, many small gifts to one another on ceremonial occasions, payment for services such as a blacksmith's fixing a hoe; and it leaves as villagers pay taxes, purchase food, cloth, housewares, and the like from the local merchants. On many social and religious occasions when people used to give one another produce or hand-crafted gifts, they now exchange manufactured items purchased from the local merchant. This economic activity has changed fashions and styles, but not the standard of living. What profits farmers might have to reinvest they lose either to the rising price of manufactured goods or to taxes.[16]

Payment of taxes absorbs an increasing proportion of

the farmer's produce. In Niger in 1948 17 kg of peanuts paid the head tax for one person. By 1971 the tax payment required 70 kg of peanuts. Hausa growing cotton in the Majya Valley in southern Niger claim that their tax bill exceeds the proceeds from the sale of the cotton crop. In Mali, a survey among the Bambara of Koulikoro indicates that taxes take 50 to 75 percent of an individual's income.

This demand for cash in the family budget has various effects. In some areas, among the Mossi for example, males migrate to urban areas. If they do not bring home cash their families may be worse off than before, having to pay taxes for relatives who do not contribute to the household economy. In many areas the head of the family production unit has chosen to limit his tax liability by dividing his lands among his children and other male dependents, making them responsible for paying their own taxes. Taxes which are very high relative to people's resources have contributed substantially to the fragmentation of the extended family work unit.[17]

All of this suggests that farmers may regard production for the market less as an opportunity and more as an unfortunate necessity in order to meet cash needs, many of which are externally imposed. If this attitude exists it should affect farmers' allocation of labor and other resources to agricultural production. Available literature on this region documents ample grounds for such an attitude

but says very little about how farmers actually do view their own economic situations and strategies for dealing with them.

Non-Economic Values Assigned to Agriculcultural Products and Processes

The value which farmers place upon what they produce and hence their priorities in devoting resources to the production of various goods does not depend upon market prices alone. Some crops and animals have little significance apart from their use as food or their value on the market. Others have acquired a deeper cultural meaning which makes them a special object of concentrated agricultural effort.

Cattle are a good example of an agricultural product which has widely varying uses and meanings in different Sahelian state societies. This is an especially interesting example from the point of view of development, because cattle are a source of much-needed fertilizer, animal traction, and protein. Attitudes toward cattle range from a rather casual interest to almost religious fascination, both influencing and reflecting the use farmers make of these animals.

Peoples who pay relatively little attention to cattle include the Mossi, the Wolof, and some Bambara. In these societies cattle have no religious significance and limited practical use; although some cultivators have learned in

recent decades to use animal traction in their fields. Most observers report that farmers adopt animal traction more readily when they have some prior familiarity with cattle, although when cattle have religious significance, or are usually on loan from kin people may be reluctant to put them to work. Wealthier farmers from predominantly non-cattle using societies sometimes buy cattle as a way of storing wealth. Cattle ownership brings prestige, and sometimes also the envy and resentment of less fortunate neighbors. The exact number of cattle owned may be a well-kept secret.[18]

People without a tradition of cattle-herding usually place their animals in the herds of the Fulbe. The terms of agreement between the Fulbe and the sedentary cultivators allow the latter very little return on their investment. The Fulbe get the milk, the manure, and very often, the offspring, of the cattle given them to herd. The cultivators sometimes suspect the Fulbe of less than total honesty in managing cultivators' cattle.[19]

Cultivators who don't herd their own cattle must get whatever manure they are going to use from the herdsmen. The head of the farm household assigns a plot of land to the Fulbe to farm during the rainy season. In return for the use of land and for millet, Fulbe herders will pasture their cattle on the farmer's fields when they are fallow and after the harvest, thus fertilizing them. The quantities

of fertilizer obtained in this way usually do not completely suffice to maintain the soil, but they help.[20]

Many Bambara and doubtless other cultivators too have begun keeping cattle themselves rather than handing them over to the Fulbe, but very few peoples are as efficient as the Fulbe in milking cattle or utilizing the manure as fertilizer.[21]

One exception to this generalization are the Serer, for whom the keeping of cattle has religious and social, as well as economic and agronomic dimensions. Through the sacrifice of cattle, the Serer communicate with their ancestors. Cattle provide milk, and the manure which fertilizes crops. Cattle are so important for both religious and agricultural purposes that the Serer try to distribute them fairly evenly among the farm households. Through a complex variety of loans and gifts, the Serer use cattle to maintain a network of mutual obligation which reinforces community solidarity. The Serer have been unwilling to use such noble animals for drawing farm equipment, and have chosen to use donkeys for traction. In recent years, the extension of the cash matrix and pressures to put more of the land under cultivation have helped to break down the traditional integration of the cattle into the agricultural system. More and more Serer pawn their cattle to merchants or, lacking sufficient pasture land near the village, send them away with the Fulbe.[22]

The Fulbe are among the most cattle-oriented of all the peoples of this region. The core values of Fulbe culture are epitomized in the relationship between a herder and his cattle. Although the focus of their lifestyle is on herding, the Fulbe also cultivate and are often able to achieve higher yields than their non-herding neighbors. Fulbe productive patterns vary tremendously, from the completely nomadic individual herdsman following his cattle on the one hand, to sedentary village-dwellers tending their rice or millet fields on the other. Simply identifying a community as Fulbe does not tell you a great deal about its productive activities.[23]

Before the colonial period the Fulbe had slaves, the Rimaibe, whom they settled in villages to grow rice and millet. The free and noble classes were herdsmen, warriors, and Muslim scholars. With the freeing of the slaves under colonial rule, Fulbe families tended more and more to settle most of their members in a semi-permanent camp where they keep some milk-cows and grow crops, and to confide the remainder of the cattle to herdsmen from their own or related families who would take the animals north during the rainy season and bring them back during the harvest. As cultivation takes on a larger role in Fulbe life, the decision-making required to mesh this activity with herding becomes more complex.

For most cattle-owning Fulbe, the needs of the herd and

opportunities for increasing it take precedence over other activities. They will eat less millet if that allows them to preserve or increase herd size. The behavior is usually economically sound as well as consonant with deep cultural values. In Mali in 1976 an 8 year old steer was worth 75,000 Malian francs ($175) or 3.5 metric tons of millet. Possession of cattle gives the Fulbe control over a major agricultural resource. Their practice of pasturing cattle on cultivator's fields to manure them has already been described. In Seno, for example, the Fulbe can get 10 kg of millet for pasturing 40 cows in a field for five days. The Fulbe also make very good use of this resource when they themselves cultivate. Intensive manuring allows them to use the same fields continuously for decades without exhausting the soil. Ownership of cattle also allows the Fulbe to use them for animal traction. In some areas, such as the Doukolomba forest, the Fulbe have larger farms and hire more farm labor than their Bambara neighbors.[24]

In some ways the transhumant cycle and the cultivation of crops complement each other nicely. The herdsmen take the cattle north during the rainy season not only to look for more pastureland but also to protect the newly planted crops and to give the herders an opportunity to gather wild millet after their own grain stores have been exhausted. In other instances the requirements of the two activities conflict with one another. Herdsmen who have taken the

cattle further south than the farming camp during the dry season may be reluctant to return north before the rains have gotten under way. This delay means that the animals are not available for plowing at the optimum time, this shortens an already very limited growing season.[25]

The analyst of Fulbe productive priorities will sometimes find it hard to disentangle economic motivations from cultural values. The cattle ethos which may appear at first to be a determining factor coexists in practice quite flexibly with many pragmatic considerations and a perhaps unexpected but highly developed competence at cultivation.

Millet is another agricultural product which often has extensive cultural ramifications. It may form part of myths of origin as in Dogon culture or have religious ceremonies associated with its planting and harvesting. Most cultivators prefer it over other food grains. One can find many instances in which people plant millet in spite of the fact that it matures later, or has a lower yield than other possible crops. Some Bambara villages in the Niger Delta area have been so pressed for land that they have had to cultivate partially flooded areas. The crop most suited to these circumstances is of course rice, which they have learned to cultivate. But they also maintain a number of millet fields, which they have built up and diked against the flood.[26]

Millet may also be the grain used to fill the communal

granaries, making the millet crop the focus of cooperative effort to insure the survival of the community. Where this is the case, among the Mossi for example, other food crops may be more easily commercialized. The social pressure to contribute personal stores of millet to the common pool is high, while an individual may sell rice or manioc, even in times of relative food shortage, without community sanctions.[27]

An analysis of what contributes most to an individual's prestige in any given society will often highlight the cultural values which motivate agricultural production. Among the Tuareg, for example, camels are still a very important determinant of social status. The Tuareg satisfy their increasing needs for cash by raising cattle, but continue to accumulate as many camels as possible. Hausa men in Niger gain prestige by having a large following of dependents. A rich man may acquire large amounts of land for his dependents to farm, not because he expects to profit from their labors but rather because putting them to work in this way is the cheapest way of maintaining the large following which makes a man powerful in his community.

Finally, peoples vary in their attitudes towards wealth, authority, and competition. They may applaud individual acquisition of wealth on a competitive basis, or seek to enforce a more communal sharing of wealth, either on an egalitarian basis, or under the authoritative direction of a

leader. These values differ not only from culture to culture but also with varying economic opportunities and activities.

To summarize, the values attached to agricultural products and processes extend beyond the economic and utilitarian. Religious sentiments, traditional attachments and associations between certain crops and social behavior, food preferences, and the culturally determined indicators of social status all influence people's agricultural behavior. People's values and aspirations also influence their view of the natural environment and strategies for dealing with it.

Ecology

Ecological relationships, like market conditions and tax policies, appear in some analyses to be objective, externally imposed constraints upon agricultural productivity, as well or better understood by the professional agronomist than by African farmers. In fact, development planners need to understand Sahelian farmers' comprehension of and strategies for dealing with environmental limitations for three reasons. First, the farmer is usually heir to generations who have had to perfect their knowledge of the environment and its potential in order to survive. The indigenous farmer may know more about the environment's capacities than the agronomist, he may take into consideration contingencies which the agronomist has not considered,

and he will definitely be more immediately concerned with not making errors of judgment. Second, the farmer's strategies for utilizing his environment, and therefore his experience of its limitations, depend upon his cultural values, the structure of his society, the technology available to him, and many other factors. A careful exploration of how farmers perceive environmental limitations will lead to an understanding of cultural and social factors relevant to development. Finally, clear communication with farmers about alteration of their strategies for obtaining maximum secure returns from an uncertain environment requires a clear mutual understanding of what those strategies are. Farmers' experience of their own natural environment forms a major part of their technological heritage—effective development requires building upon this rather than trying to erase it.

Fragile soils and limited water resources are environmental realities most farmers must deal with in one way or another. Most of the area of each of the Sahelian states receives less than 1000 mm of rainfall each year, falling during a rainy season which is often so short and irregularly interrupted that farmers must guess the optimal time of planting and hope that if they wait long enough to assure themselves that the first rains were not a false start, there will still be enough days of rain left, at the right times, to bring the crops to maturity. Only south of the

1000mm isohyet can farmers count on enough rain in most years to guarantee full crops of millet, sorghum, and maize. Very large areas of Mali, Niger, and Chad receive less than 400 mm of rain each year. In these areas the cultivation of crops is not possible without groundwater. Pasture grasses grow in these areas, but the rainfall is extremely irregular. A grassy pasture area in one year may receive no rain and thus grow nothing for the next two years. The irregularity in rainfall timing and quantity also affects the flooding of the rivers which flow through the Sahelian states. Both the timing and the height of the flood vary from year to year.[29]

Even a more detailed overview of the Sahelian states could not do justice to the great local variability in soil and climatic conditions. Planners' lack of attention to local variation has contributed to the failure of at least several development projects. For example, the Office du Niger is a large (about 40 000 hectares) project to organize and facilitate the growing of rice and cotton on irrigated land near the Niger river in Mali. For a variety of reasons, it has never made a profit. Productivity has not reached projected levels, in part because the irrigation system keeps getting silted up and clogged with weeds. The engineers who built it did not survey the land accurately beforehand, and did not take into account small local differences in elevation. The project is now in the position of having to

ask the farmers to work longer hours at maintenance to compensate for faulty construction stemming from insufficient awareness of specific local conditions.[30]

Similar difficulties arise in trying to implement changes in agricultural technique. In the early 1960s SATEC attempted to popularize donkey-drawn plows and mineral fertilizer among the Mossi in the Upper Volta. This project too failed for a number of reasons. Farmers did not adopt the new technology. Three years after the project began, only 7% of the 1,300,000 farmers contacted had joined cooperatives in order to buy equipment and fertilizer. Of these, more than a third were "inactive," and many others were not using their equipment as intended by the planners. Furthermore, by the project's sixth year, 76% of the farmers had defaulted on their loans. Project personnel began to devote more time to collecting overdue loans and reclaiming equipment than to extension work, and the number of participating farmers declined still further.

Farmers were reluctant to adopt this new technology because they realized that it was often not appropriate for the land they were cultivating. Although agricultural research stations had operated successfully with the equipment and methods they recommended, they had not made sufficient allowance for varying local soil conditions. The optimal fertilizer balance for each farmer's fields was not necessarily the one suggested by the research station. The

cultivator recommended by SATEC could not be used on all soils, some fields were too rocky or too hard to be cultivated with donkey traction. In one area a third of the donkeys died because they had not been innoculated. The project failed not, as one of its evaluators claimed, because it was presented wrong to the farmers but rather because some of the farmers knew better than the project planners what was feasible in their environmental situation.[31]

Variations in rainfall, groundwater, and soil type over space and time become even more important to farmers where the environment is such a challenge to survival. Whereas the thrust of much agricultural modernization in the rest of the world has been towards standardization, the creation of stable and homogeneous conditions which permit the uniform application of technological advances such as special seeds, fertilizer, irrigation, and machinery, Sahelian state farmers have concentrated upon maximizing their adaptation to variability over space and time. They select crops and seed types according to the fertility, composition, and dampness of the soil, and often plant several varieties to maximize security under uncertain rainfall conditions. They may scatter and diversify their animal holdings. They often move their herds, fields, and even dwellings, a strategy which discourages heavy investment of labor in any one piece of soil.[32]

Diversification is one major strategy for increasing

security in an uncertain environment. Cultivators usually have at their disposal many varieties of their traditional food crops such as sorghum and millet, each with its own growth season, degree of drought resistance, yield per acre, resistance to insects, and other characteristics. They choose among the possibilities, balancing off the quantity of the yield, food preferences, and security under adverse conditions. Especially since the drought, even farmers who specialized in cash crops have begun to grow food crops as well. In many areas farmers have also begun to use a wider variety of soil types and water sources—upland, valley, and river-bank soils, rainfed dry land, flooded land and irrigated areas, each with its own set of crops and associated agricultural timetables. Some farmers have immediate access to this whole variety, others may migrate from one setting to an other. Urban migration during the dry season supplements this rural diversification.[33]

The drought has also encouraged people to blur still further the distinctions between farming and herding populations. Many cultivators have begun to keep cattle and smaller animals like goats. Herding populations establish camps during the rainy season and grow crops.

Mobility, like diversification, is a recurring agricultural strategy in each ecological zone in the Sahelian states. For example, farmers who grow rice along the Niger must contend with the yearly changes in the timing and height

of the river's flood. A survey of the fields in one village showed that the vast majority of them had been under cultivation for less than three years. Since the height of the flood seems to change cyclically, a field might be flooded to the proper depth for several years, and then either flooded too deep or left too dry as the river moved up or down. Many dry-land cultivators have relied upon mobility to guarantee fertile soils, avoiding the labor investment required for the maintenance of continuously cultivated land.[34]

Herders, also, choose diversification and mobility as a strategy for survival in an unstable environment. Herdsmen must cope not only with an extremely uncertain rainfall in minimal quantities, but also with epidemics of animal diseases which can quickly decimate their herds, dry season sandstorms which scatter herds and may kill animals, and predators like jackals. Bovine plague has swept the sahel every twenty to twenty-five years, wiping out 75-100 percent of the animals in affected herds. Flexibility and adaptability are of primary importance. The Tuareg, for example, own a variety of animals including camels, cattle, sheep, and goats, each with different environmental needs. Cattle and sheep graze upon grass and need to drink often, they must be pastured near a well or water source. Camels both graze and browze upon shrubs and trees. They need to drink less often and can be pastured further from water sources. Goats

browse and need to drink often, but they drink so little that water for their needs as well as for the rest of the camp can be brought along in skins on donkeys. Of these animals, sheep are the only ones to need full-time attention from adult shepherds. Goats can be herded by children, and camels and cattle require attention only for watering and milking. The distribution of pasture and water resources among different types of animals can be balanced to achieve maximal use of available resources. Goats provide an important element of security because they are hardy, breed quickly, and can drop their young in off seasons, thus assuring the camp's milk supply.[35]

Mobility is of course absolutely necessary to keep all these animals in pasture. Herds have a regular seasonal movement north during the rainy season and south during the dry season. This transhumance follows regular but not rigidly repetitive patterns. Because of the irregularity of the rainfall the herdsman must be alert to make the best use of each year's unique pasture conditions. In dry years, the whole transhumance cycle moves farther south in search of water. Under extreme drought conditions, herds may be taken a long way from their usual transhumance areas.[36]

The only way that pastoral peoples have of storing food is in the form of live animals. This encourages them to maximize herd size. The present state of veterinary resources in the Sahelian zone does not allow herders to feel sure that

their animals will remain alive—security therefore lies in owning the maximum possible number of live animals at any given time.[37]

In order to protect their herds from localized disasters, many herding peoples distribute their animals as widely as possible. Through a complex system of gifts and loans, building up a network of solidarity, mutual obligation, and redistribution, each family places its animals among different herds in several different areas. If one herd is wiped out by an epidemic, the family will still have animals with other herdsmen.[38]

Finally, under periods of stress herders have shown great flexibility in their productive activities. In past decades, hunting has been an important fall-back activity. Gathering of wild grains and fruits can tide a family over a couple of lean months. Commercial activities and, in the past, raiding, have provided important income supplements. Cultivation has tended to play an increasingly important role in the economic life of many people who identify themselves as herders. Some have even changed their ethnic identity and taken up a new life style.[39]

Mobility as an adaptive strategy has important limitations. First, population growth and the expansion of the area under cultivation for cash crop production have created land shortages in many areas. Where there is no more uncultivated bush, and fallow periods are too short for soil

regeneration, soil exhaustion becomes a serious problem. The expansion of cultivated land also encroaches upon land historically used by herders, restricting their movement. National borders and customs duties put further limitations on herders' freedom of movement.

Furthermore, mobility diminishes returns in certain ways for both cultivators and herders. It makes the systematic processing of animals—inoculations, dipping, and the like—more difficult. It discourages the investment of labor which could bring higher returns from the soil. For example, the rice cultivator who has to move his fields up and down the riverbank often does not find it worthwhile to expend the labor necessary to plow or cultivate deeply enough to remove all the old root systems of the wild rice and other plants. He usually does not erect underwater fencing to protect his rice shoots from being eaten by fish. He may deal with the fish problem by planting a variety of rice that is more fish-resistant, although it gives a lower yield. Finally, because he has no means of controlling the flow of water into his fields, he must choose a rice variety whose growth pattern gives him a certain margin of safety in case the flood recedes sooner than expected. The farmer could achieve a higher yield per acre if he were working under more stable water conditions, which would then make it worthwhile for him to improve the growing conditions in each field.[40]

In view of the above it may seem that the obvious

solution is technological—deep-bore wells, dams, fences, irrigation systems, whatever is necessary to increase man's control over, or ameliorate the environment. These solutions may engender very serious social and economic as well as environmental problems of their own, however. From the viewpoint of the individual farmer, these technological innovations may introduce new and more dangerous risks, new kinds of dependency, and demands for social behavior foreign to his expectations and desires.

The effects of drilling deep-bore wells in the Sahelian zone are a classic example of these difficulties. Before these boreholes herders depended for water on shallower wells, which flowed and dried up according to a familiar and at least minimally predictable pattern. In theory, the deep boreholes do not dry up. In practice, the herder is dependent upon the availability of both a mechanic able to fix the well pump and spare parts. The herder will probably not be able to make any sense out of the absence or presence of able mechanics and spare parts—he will have let himself become dependent upon processes which he cannot understand and which may seem entirely unreliable. Experiences like this increase local-level cynicism about the activities of Europeans and Americans.

If indeed the pump does not break, the herder has a new set of problems. The presence of abundant water provokes tremendous overgrazing in the area of deep-bore wells.

Traditional patterns of water and pasture allocation among these pastoralists offer no basis for limiting access to an expecially abundant well. Furthermore, the continuing availability of water during dry periods has proved ultimately deceptive to herders who remained too long near the bore holes, for they found themselves trapped by miles of dessicated countryside between their herds and pastures to the south.[41] Technological leaps make the farmer dependent upon a less familiar universe, they introduce new social problems—ownership, control, upkeep; and they may have adverse consequences on both community life and productivity. Maximization of human resources appears most likely with the introduction of a technology which can be understood, run, and repaired by villagers themselves.

One could easily multiply examples of development projects which either failed because local peoples preferred their own ecological strategies, or succeeded and in so doing upset the ecological balance of a village or a whole region. A plan to persuade inhabitants of a Senegalese village to remain in the village instead of migrating to urban areas during the dry season did not take into account the fact that the village well dried up for those months. The Canadian government planned and financed a huge fenced-in cattle ranch and breeding station near Ibesseten in Niger, but their fences cut across a major north-south transhumance route.

The way in which a population meets its nutritional needs must be understood and protected or improved upon if production for the market is not to produce hunger in the village. An example of a development project which could lead to malnutrition is the "Bakel Range/Livestock development perimeter," intended to involve the Fulbe and Toucouleur in a particular region of the Bakel District in producing beef calves for the market. Undernutrition in this region is already a serious problem, exacerbated by lack of water for cattle and for crops. Milk is a crucial item in the Fulbe and Toucouleur diet; calving, and the freshening of milk cows occurs during the "hungry season," when the previous year's grain has been consumed and crops in the ground require heavy labor. The farmers must balance their own nutritional needs against that of the calves in the herds they are trying to reconstitute.

The project planners propose to keep the cattle in a managed range area rather than returning them to the owners' villages every night. This interferes with two important indigenous nutritional strategies. First, it deprives the village fields of an important source of fertilizer and second, since the calves are to run with the herd, it deprives the villagers of milk. The project planners have assumed that chemical fertilizers and a communal village milk herd will be adequate substitutes. Even assuming that the project managers give these items sufficiently high priority, the

problem remains of whether or not the Fulbe and Toucouleur will be willing or even able to make very fundamental changes in their modes of cultivation and herding. By disrupting one cultural-ecological system before the farmers have understood, approved, or begun to assimilate the new one, the project may deplete local food resources even more.[42]

Development which changes the productive activities in one area may have adverse effects in another. In the early part of this century the Hausa and Tuareg in the Adar and Azawagh areas of Niger maintained complementary production systems. During the rainy season the Hausa and Tuareg ex-slaves grew sorghum on the valley floors and millet on the sides of the dunes. They sold the surplus to Tuareg herders who spent the rainy season north in the Azawagh region. After the rains, the Tuareg came south with their herds to use the pasture which grew as the rainy-season water courses dried up. Development projects in Ibohaman and Badeguicheri have persuaded the Hausa to grow cotton, peanuts, and vegetables for market in the land which used to grow millet and pasture grasses, thus depriving both the Tuareg and their herds of a source of food. Similar disruptions of old production and distribution patterns have taken place all along the Sahelian belt.

It seems clear that if the Sahelian states are to become nutritionally self-sufficient, cultivators will have

to employ more intensive methods of agriculture, which maintain soil fertility and produce a higher yield per acre. Several Sahelian peoples have developed such systems. These are worth studying in order to see what technology, labor organization, cultural values, and other factors contribute to the maintenance of intensive agriculture, whether the methods used could be improved upon without upsetting the system, whether these societies have found solutions to agricultural problems which could be used elsewhere in the Sahelian states, and, finally, what social forces threaten the successful practice of intensive agriculture.

In an area of western Senegal a little to the south of a line running between Thiès and Diourbel, the Serer have developed a system of intensive agriculture capable of supporting 50-60 inhabitants per km^2 with no depreciation of soils. This is a very high stable population density for an area which has predominantly light sandy soils and a rainfall of approximately 700 mm per year. In the last decade a variety of forces have begun to disintegrate this agricultural system; I will describe it as it worked in its most successful form first.[48]

The Serer relied upon both fallow and fertilization to maintain their soils. They divided their fields in a manner which varied somewhat from village to village and area to area but basically reserved the area closest to the dwellings for continuous cultivation of millet (their most valued crop),

assigned a surrounding ring of land to the alternate cultivation of millet and ground nuts, and rotated the fields outside these two concentric rings in a three year cycle of millet, groundnuts, and fallow. Lowland fields which had heavier soils and more moisture followed their own rotation system.

Fertilization during the dry season and fallow periods came from cattle and trees. Most adult Serer owned cattle which they kept in the village specifically to manure the fields, instead of handing them over to herders like the Fulbe Through a system of loans and gifts they distributed the cattle fairly evenly throughout the village. A person who owned no cattle and had no claim on anybody else's could borrow one with the understanding that his first year's crops would go to the owner of the cow who fertilized the field. Cultivators using cattle manure for fertilizer must solve two problems. The first is keeping and feeding the cattle, and the second is getting the manure onto the fields. The Serer solved these problems by fencing their fields with hedges, and letting the cattle wander over all fields not actually under cultivation. During the rainy season the cattle grazed the fallow fields and dropped their manure there. During the dry season the cattle roamed freely over all the fields, eating stems and stubble from harvested crops. To insure an even distribution of manure, herd-boys tethered the cattle at night and moved their location every two or three

days. Thirty cows need five or six weeks to fertilize a hectare; the Serer kept enough cows to fertilize before each sowing of millet.[44]

The Acacia albida also played an important role both in feeding the cattle and in directly fertilizing the soil. The Acacia albida puts out its leaves during the dry season, becoming an important source of supplementary feed when the cattle have grazed the harvested fields clean. As the tree drops its leaves, each tree fertilizes about $100m^2$ of surrounding soil. In the older Serer farmlands, groves of Acacia fertilized about 20-50% of the land.

The most unusual features of this system are the extensive and deliberate planting of Acacia albida, and the systematic and thorough manuring of the fields. In recent years rapid population growth and increasing involvement in cash crop agriculture have pushed the Serer to put more land under cultivation, curtailing their planting of trees and shortening their fallow periods, leaving less room for the cattle, now more and more often sent out with the Fulbe herdsmen. Indebtedness to local merchants who take cattle as security also removes cattle from the fields. Conversion to Islam and the weakening of traditional religious commitments to care for the soil may also play a role in changing agricultural behavior. Growing areas of exhausted soil have been the result.[45]

The economics of cash crop agriculture bear close

examination here. The Serer must pay out . ost of the proceeds of their groundnut sales, to the government in taxes and to the cooperatives for equipment and supplies. Since groundnut production is a major cause of soil exhaustion, this activity may result in a net loss for the Serer.[46]

The Dogon provide another example of ecologically stable agricultural system. They have developed methods which allow them to support population densities of over 50 inhabitants per km^2 under exceptionally difficult conditions. Pursued by the Fulbe and other military forces during preceeding centuries, they took refuge in the least accessible areas of the Bandiagara escarpments and plateau. This strategy left them access to very limited amounts of soil interspersed among rocky outcroppings, deep gorges, large expanses of flat rock, and in pockets in the escarpment talus. The area receives 500-700 mm of rainfall each year, most of it in July and August.

Faced with this challenge, the Dogon have developed numerous methods of preserving and improving the soil. First, in order to avoid erosion and improve drainage, and facilitate irrigation of garden plots during the dry season, the Dogon have built many small earthworks—retaining walls and terraces, cleared gullies for better drainage, carefully sloped garden plots at graduated levels beside inclined irrigation ditches. In cultivating, the Dogon often heap a little mound of earth around each plant. Second, the Dogon use several methods of soil

fertilization. In areas where they can grow, the Dogon encourage Acacia albida and other trees, both to hold soil in place and to restore fertility. Dogon invite the Fulbe to pasture their herds—including some Dogon cattle—on the stubble after harvest and to tether their cattle at night in harvested fields. Perhaps the most important and, in this area, unusual technique is the construction of compost heaps which accumulate all of the household debris and straw cut from the fields. Just before sowing time, work groups of young people carry all this to the fields. The Dogon also create green manure by covering piles of weeds with earth as they clear the fields, spreading and digging it in later. The alternative process for clearing these fields is burning, which, though easier, is less beneficial for the soil and injures any trees in the area.[47]

Dogon territory includes a variety of soil types and water conditions, each mico-environment produces a carefully chosen cycle of crops and receives careful tending according to its requirements. Irrigated truck gardens allow agricultural labor to realize returns even during the dry season. One observer in the mid 1960s speculated that if transportation and marketing opportunities during the rainy season were improved, the Dogon would devote more labor to intensively cultivate rainy season crops, such as rice.[48]

Dogon and Serer agriculture (among other possible examples) offer alternative models to the more extensive,

mobile, agricultural systems widespread in the Sahelian states. Do these two peoples, from a developer's point of view, make better use of environmental resources? If so, why have they not served as models for surrounding peoples? Why do the Serer and the Dogon not continue to employ their very effective techniques of manuring when they migrate to new areas? Do they not feel the practical necessity or are the traditional methods for them so embedded in a matrix of religious meaning and social interaction that they seem inappropriate to a migrant in a new setting? Questions such as these have not been answered in the literature and, because they are essentially questions about the interrelationship between a farmer's knowledge, his social and natural milieu, and the techniques which he chooses to use, they deserve further research.

A major factor influencing the human-environment relationship is the social organization of the work force.

The Organization of Labor

The organization of labor shapes people's approach to productive activities and their response to proposed changes. The successful introduction of new technology and institutions at the local level depends upon their perceived utility to functioning local labor units. A sad example to prove this point is the failure of the SATEC project to introduce plows among the Mossi, discussed on pages 28-9. Farmers cultivating soils on which the plows could have been useful often lacked

the manpower to use them. Weeding with donkey-drawn equipment requires three people—one to guide the donkey, one to guide the weeder, and one to weed between the plants along the line of sowing. Mossi social attitudes require that the guiders of the donkey and the plow be men, yet very few Mossi households these days contain two adult men; even if two men are normally present, one of them may be incapacitated at a crucial point in the growing season.

In order to understand the organization of labor one must explore both the distribution of tasks according to sex, age, and lineage, and the size and structure of the work units. The patterns in the Sahelian states are many and varied, and nearly defy systematic description. Basically, there are three types of work units which may or may not be present in each society. One is the lineage unit. This varies in size from the small nuclear family to a large portion of a village and perhaps beyond. Lineage work groups may exist at several different levels simultaneously in the same village. They are usually patrilineal in their structure although they may attract sisters' sons and other individuals who have become dependents of the family. The second type of work unit is based upon locality, age, and sex. Village age sets are an example. The third type is based upon the relationship of a number of workers to a leader. The shaikhs of Muslim brotherhoods or, in some cases, chiefs, are examples of such leaders.

Descriptions of work units among the Wolof and the Mossi follow, in order to illustrate both interethnic and intraethnic variety.

Wolof

Wolof society contains both lineage work groups and leader-oriented work groups. Age sets may have been important at some time in the past, but are not so today. Lineage work groups have tended to become smaller as a result of participation in cash crop agriculture. In the long-settled areas of Cayor the pre-colonial social organization has retained more importance than among the more commercially developed Wolof populations of Sine-Saloum and Baol. The largest lineage work group before involvement in cash crops was the extended family household and included the oldest male, his younger brothers, their wives and children, children's wives and children, slaves, and other household dependents. The oldest male coordinated labor on a large communal millet field, whose harvest fed the family throughout the year. Family members also received plots to work individually each year, but the land and labor given to these was small compared to the communal fields.[49]

As the Wolof produced and sold more groundnuts, male heads of hearths within the large extended family household sought more economic autonomy. Lineage work groups fragmented down to the nuclear family, growing both peanuts and a diminishing quantity of food on its common field. The

importance of individual fields in the family allocation of resources grew.[50]

Leader-oriented work groups grew up around the shaikhs of the Mouride brotherhood, founded in the peanut basin by Amadou Bamba in the last decades of the nineteenth century. These marabouts, as the French called them, gained a priviledged economic position during the colonial period and maintained it after independence. They transformed the traditional West African Muslim Quran school, or dara, into a kind of work camp. These attracted adolescents and young men willing to work very hard under extremely difficult conditions in order to prove both their masculine powers and their religious devotion. Dara members work communally under the direction of one of their number appointed by the shaikh. He may require the dara members to support themselves during the dry season by hiring themselves out or begging, and to provide their own clothing. The shaikhs established these dara in previously unsettled areas, often miles from wells or other water supply—taking advantage of the devotion of their labor force to settle lands no others would have tried. After a worker has spent a number of years in a dara, the shaikh may provide him with land to farm for himself. Supported by the dara, other Mouride followers, or talibes, have come to settle in these areas as well.[51]

The dara membership includes a very small proportion of all Mourides, but sets a strong moral example. Ordinary

brotherhood members also give substantial gifts of money, produce, and labor to their shaikhs. Important shaikhs have village fields cultivated by talibes who take a few days away from their own fields each year, constituting a temporary work group.[52]

Mossi

Mossi society has all three types of labor organization, although two of them may not function as actively now as they used to. Lineage work units have existed at several levels simultaneously. Each Mossi village contains members of several clans, divided in turn into living units known as either saka or yiri. A saka is a group of family members and associated dependents living together in an enclosure under the authority of the head of the lineage within that village. A yiri is a family enclosure which contains part of a lineage but not the lineage head. Each saka or yiri comprises several zaghase (sing. zaka) or nuclear families. These saka and yiri are flexible units which either grow and subdivide or collapse by joining existing units as dependents. Each clan spreads itself around many villages.[53]

At each level of this patrilineal organization—clan, saka, and zaka, the male head of the unit has fields to which all members have traditionally contributed labor. Part of the harvest from those fields went to group functions such as religious feasts, and to group members in need. These fields were a kind of community treasury and insurance fund, under

the control of the lineage head at that level. Each Mossi farmer, whether male or female, also cultivated his or her own personal fields. Each farmer had a right to produce from the fields he or she worked at each level in a proportion which depended upon the amount of labor contributed, on the degree of need, and on the resources available.[54]

The Mossi also had informal, ad hoc work groups, age groups, and groups which gathered in chiefly households. The ad hoc work groups gathered when a farmer called upon his kin or neighbors for help with a particular project like weeding a field or building a house. The village youth, organized by circumcision age sets into an age group, formed a work group known as the soasoaga. Any farmer could call upon them for one or several days, in return for food, or, in recent decades, cash. Finally, Mossi chiefs gathered around them young unmarried men who worked for a period of time in the chief's household in return for help in finding a wife. This is the kind of labor group through which the Chief Albert Zoungrana was able to introduce a number of new crops.[55] (See pp. 54-5.)

Participation in the cash economy, migration, and other recent social changes seem to have weakened the cohesion of most Mossi work groups. Lineage work units have become smaller, in many or most cases confined to the nuclear family. Age groups, where they still exist, tend to work only for farmers who can afford to pay them. No data is

available on the chiefs' households, but they, too, can be presumed to have dwindled. The condition and responsiveness of these work groups to various stimuli probably varies from region to region within Mossi territory.[56]

These three kinds of work groups—lineage, age and locality, and leader-oriented—each tap different sources of motivation and energy and run afoul of different sources of discontent and disinterest. The lineage work group is, to a greater or lesser degree, authoritarian and hierarchical. The senior male makes most of the decisions about crops to be planted, fields to be used, the timing and allocation of labor, and the like. He also distributes the harvest. If he sells crops cultivated in the communal field, he often does not distinguish between family or lineage funds and his own personal funds. In most societies he used to control the family resources necessary to arrange marriages. Each male in the lineage is ranked by his birth order and his father's birth order so that a very junior male may find himself with rather restricted prerogatives. As the spreading cash economy makes it at least theoretically possible for junior members of the lineage to establish a life for themselves outside of the lineage economy, more and more of them do so, sometimes by migrating, producing a fragmentation of lineage work groups. Islam provides a religious milieu which validates a more individualistic orientation. Among herders, poor grazing conditions are scattering lineage

groups over wider areas.

On the other hand, family ties remain strong. People turn to members of their own lineage first in times of adversity. In some areas farmers see the cultivation of communal lineage group fields as a way of insuring their sustenance each year. The main attraction of working as part of a large lineage-based group seems to be security, as long as enough land is available for all lineage members to cultivate.

The ability of farmer's cooperatives to graft themselves onto the tradition of lineage cooperation has been negligible. A democratically organized farmers' cooperative presupposes a tradition of interaction among equals which is simply not present in most societies. Widespread, hopeful references to the "basically communal" nature of African village life have not taken account of its equally strong hierarchical traditions.[57] Patterns of social deference remain, and insure that at cooperative meetings only the elders and the most prestigious farmers will speak out. Farmers who have split off from the lineage to cultivate their own fields are not about to re-submit themselves to the authority of the same lineage elders they are seeking to be independent from. The cooperative movement has foundered at least partly on the cross-current between traditional patterns of deference for elders and a newer striving for the economic independence of the nuclear family.

Age sets have a more egalitarian orientation than either lineage or leader-oriented work groups. In societies in which birth order is one principle of hierarchical differentation an age set, composed of all the people who have participated concurrently in some age-related ceremony, like circumcison, is by definition a gathering of equals. The Bambara, for example, have traditionally insured that this should be so by entrusting the leadership of the age set association or tõ to someone whose social status precludes his extending this power into other spheres—usually a person of slave ancestry or a member of one of the occupational castes. The egalitarian nature of age-set organization permits these groups to offer security to their membership in the form of mutual aid and achieve considerable efficacy in community affairs without thwarting their members' desires for autonomy and independence from authoritarian direction. In societies which have a tradition of age-sets these groups may become increasingly important as economic individualism fragments the extended family and erodes the security it offered.

A study done in the Majya valley, in southern Niger, underlines the growing importance of age based mutual aid networks among the Hausa. These work and mutual aid groups, consisting of an average of ten to twenty males who were together in the village youth organization, seem to be a relatively recent institution coinciding with the dissolution

of lineage work groups. Members of these age groups perform many kinds of farm labor together, including clearing the land, harvesting, and the two weedings required for millet and sorghum. Each member does the sowing on his own, and disposes individually of his crop after the harvest. During the dry season these groups construct the wells, fences, and irrigation systems necessary for onion gardens (a cash crop), and haul the water for irrigation. Again, the proceeds from the harvest are private. Housing construction is also a group activity If a member is ill or absent, the rest of the group works on his behalf. Members are obliged to lend one another food. The debts thus formed may not be collected unless the lender himself is in need. This constraint gives rise to a network of debts which adds to the social cohesion of the group. Groups such as these would seem to form natural units of mutual trust and cooperation which could be very effective in planning and implementing village development projects.[58]

The Mali government has at various times collaborated very effectively on development work with Bambara tõ. Traditionally, the young people's tõ, which included males from the time of circumcision to the age of about 35 and females from the time of initiation to marriage, was responsible in each village for a variety of tasks—village projects, the upkeep of paths and roads, the cultivation of the fields of the poor and disabled. They were also a work

force available for hire—for money or food and drink. The Mali government after independence attempted to enlist the aid of these youth associations as "Mali tõ," and in many cases succeeded in arousing a substantial degree of enthusiasm. The government also required each village to grow cash crops and adopt new agricultural techniques in a communal field. Although responsibility for work in the communal village fields had not traditionally fallen to the youth tõ, the "Mali tõ" in many cases responded to the urgings of the party to demonstrate new agricultural techniques on collective fields. Part of the success of the CFDT in popularizing cotton-growing techniques resulted from their use of the tõ cultivated village fields as demonstration plots. Contrary to the government's wishes, the tõ fields never expanded into full-blown collectivized agriculture; in fact, tõ members continued to devote more effort to their own personal fields than to the communal fields. Nevertheless, tõ members did learn and adopt new agricultural techniques and they did occasionally provide the labor power for other village projects as well.[59]

The Bambara and Hausa examples suggest that wherever age-sets, age-groups, and mutual aid networks have some vitality they deserve to be developed as valuable institutional supports to agricultural growth.[60] Similar groups exist in the area of the old Ouadai kingdom in Chad, among the Dogon, and in many other societies.

The viability of leader-oriented groups as foci for development varies with the interests of the leader and the commitment and motivations of the group members. A comparison between the Chief Albert Zoungrana's introduction of Mossi dry-season truck gardens and the French attempts to introduce new agricultural techniques via the Mouride shaikhs illustrates some of the variables.

Although knowledge of the garden crops and how to cultivate them came from Europeans, the diffusion of this new agricultural method was entirely in Mossi hands. A former provincial chief of Koupela, Albert Zoungrana, became familiar with truck gardening during his childhood at a mission station around 1920. When he assumed the chiefship in 1929 he directed the young men who had come to live in his chiefly household to plant vegetable gardens in the lowland areas. He had both a demonstration plot and a "cadre" of gardeners who planted gardens of their own when they returned to their home villages. These plots were well-manured, and irrigated or watered daily from nearby wells, and thus could be cultivated in the dry season. This enables the Mossi to use their labor profitably during an otherwise slack period. Garden crops include onions, tomatoes (both indigenous and European), potatoes, cabbage, eggplants and other condiments. By the late 1960s about two thirds of the household heads in this area cultivated lowland gardens. Fruit trees also grow well in these fertilized lowland areas, and provide other

marketable crops.

Growing market opportunities in this same area also led the Mossi to cultivate increasing quantities of manioc and rice. Chief Zoungrana introduced manioc in the 1930s, and farmers grew it when they discovered they could sell it to the Hausa and Yoruba merchants and when they saw that it grew in years when the millet crop failed. By the late 1960s about half the households in this area had at least one manioc field. The farmers also used the plots cleared and fertilized for their dry season gardens to grow rice in the rainy season. Rice cultivation received a boost from the introduction of animal-drawn agricultural implements and improved seeds in the late 1950s. By the late 1960s farmers in the Koupela area spent more agricultural labor time on rice (35%) than on any other single crop. The success of the truck gardens and other lowland crops seems to have resulted partly from Chief Zoungrana's enthusiasm for them, and partly from the opportunity they offered farmers to increase their income. Both leader and followers were effectively motivated.[61]

By contrast, none of the many efforts of the French to interest the Mouride shaikhs in improving their agricultural techniques has born much fruit. Beginning in the 1940s the French looked to the Mouride shaikhs as collaborators in development. In earlier decades the Mourides had settled and produced groundnuts along the new

railway lines and availed themselves of wells dug in the "Terres Neuves" by the colonial government. In 1947 the French established the Bloc Experimental de L'Arachide at Boulel. They hoped to mechanize groundnut production in cooperation with a Mouride shaikh who was to supply the work force from his dara. The project failed for both economic and social reasons. The soil would not yield enough per hectare to pay for the heavy equipment used to cultivate it. The talibes did not derive any profit from their labors and were consequently uninterested in carrying out new agricultural techniques, and the shaikh decided that the whole venture was less profitable to him than his usual methods. In 1949 the Agricultural Service began another, similar project with three other shaikhs. They furnished chemical fertilizer, some farm machinery, and a plan for crop rotation. The farms never produced as planned, again in part because the talibes were not motivated to apply the new techniques correctly. The motivation of the shaikhs was not clear either, they may have been more interested in the project for its prestige value than for its effects upon production.[62]

The Mouride shaikhs have been selective in their attitude towards government development efforts, utilizing those which suit their purpose, and rejecting those which do not. Since the 1940s first the colonial government and then the Senegalese government has tried to contain the Mouride expansion by keeping

some of the uncultivated land "classified." The Mourides have preferred to pressure the government to open up "classified" land rather than develop a more intensive agriculture. The political power of the Mouride leaders has often allowed them some success, even when their expansion clearly opposes the interests of other users of the land and disregards all principles of soil conservation. The Mourides have violently displaced Fulbe pastoralists and uprooted or burned even trees planted by the government to protect the soil. The shaikhs have been quick to take advantage of loans for seed, fertilizer, and agricultural equipment; their record of repayment is not good, and the money they borrow has not always found its way into agricultural investments. They have been known to "lend" government seed stock to their talibes at usurious rates. Anything which threatens to weaken the talibes' dependence on the brotherhood, such as schools and medical clinics, has met with opposition from the shaikhs. One Mouride estate expelled a SATEC extension worker so that he wouldn't expose mismanagement.[63]

Both the colonial and the Senegalese governments have tried to foster peasant cooperatives for marketing crops and supplying agricultural equipment, seeds, and fertilizer. From 1947 to 1951 the shaikhs founded five Mouride "coops." The shaikhs put up most of the initial capital and paid their talibes' membership fees. The "members" never met and the shaikhs tried to use this cover to force the talibes to sell

their crops and take out loans in an institution controlled by the shaikhs. They also used the "coop" to get loans from the government which they turned to their own personal or non-agricultural business use. When the government tried to collect the money, the shaikhs either raised it from the talibes or sold their political influence. Having learned well to use the "cooperative" form during the colonial period, the shaikhs had little difficulty using more recently formed coops for their own ends.[64]

Other local notables besides the shaikhs have tried to control Senegalese cooperatives for their own benefit, and the history of this aspect of the Senegalese development effort is disappointing. On the grass-roots level coops have been the arena in which local elites, whether they be shaikhs, descendants of old noble lineages, or simply comparatively wealthy individuals, struggle to consolidate their control over the political and financial affairs of the community. Hindered in many instances by disorganization, bad management, or corruption at various levels, they have functioned neither as effective conduits of agricultural extension services nor as agencies of peasant self-help. The government's program of Animation Rurale, designed to increase peasant initiative in the years following independence, withered under opposition from the Mouride shaikhs and other local elites.[65]

The Mouride example demonstrates very clearly the dangers of trying to collaborate in development efforts with

local leaders whose strategies for maintaining power are not consonant with optimal resource management or social welfare.

The various types of labor units just discussed exist in a larger context of specialization of labor by age, sex, caste, and ethnic group. Ethnicity is perhaps the hardest of these categories to define and the most variable in its meaning and uses. Colonial governments in their haste to develop an orderly model of their subject populations seized upon what critics have termed the "cupboard theory of African societies." They assumed that maps of language use, membership in a political structure, religious beliefs, cultural characteristics, and productive systems were coterminous, that membership in one or another of these "tribes" was established at birth, and that relations between ethnic groups were likely as not to be hostile. According to this approach a person's ethnic identity revealed a great deal about him, including his character.[66]

Since then, the literature on ethnicity has burgeoned. Ethnic labels have revealed their historically flexible and relative character. For example, there is no "origin of the Serer." One can trace the history of the name and get a rough idea of its application but even today any definition of the Serer as a group is bound to be arbitrary. Language, some cultural traits, agricultural practices such as patterns of crop rotation, traditions of origin, and

political affiliation during pre-colonial times all vary from one end of what might be called "Serer country" to the other. Some of these may be recent variations but uniformity has never been the rule. Some offspring of Serer parents have joined the Mouride brotherhood and could well be called Wolof. When one speaks of "Serer agriculture," therefore, one is making a rough approximation, a model for purposes of discussion, not describing a plan which is replicated from village to village. The above limitations must be applied in one form or another to all ethnic labels in Africa.[67]

With the above caveat in mind, one can make the rough generalization that modes of gaining a living form part of the cultural patterns often referred to by ethnic labels. The Bozo and the Somono, for example, each tend to use distinctive fishing techniques (though individual villages may depart from the general pattern). Tuareg, Fulbe, Arab, and other pastoralists each tend toward their own selection of animals and ways of caring for them, though again in many instances reality does not correspond to the abstraction, and many Fulbe are better cultivators than some of the groups usually labeled as such. The crops grown, methods of fertilizing and watering, patterns of field allocation, and many other farming practices also vary very roughly along ethnic lines among cultivators.

Individual mobility from one ethnic group to another is

very common, especially where two or more ethnic groups distinguish themselves from one another by occupying different ecological and occupational niches in the same general environment. A wealthy Hausa who has accumulated a large number of cattle may decide to orient his activities around herding rather than farming. He takes on the Fulbe life-style and becomes Fulbe. Conversely, a Fulbe who has lost all his animals may settle down to farming and become Hausa. Documented mutations include Serer to Wolof, Fulbe to Bozo, Malinke, and Bambara, Bozo to Sonrai, and others. Migration to urban areas is, as one might expect, a frequent occasion for the assumption of a new ethnic identity.[68]

Ethnic mutation is not limited to individuals. Whole villages may decide to identify themselves differently, changing from a pastoral to a sedentary life-style or converting from a local religion to Islam.[69]

Prestige often contributes to an individual or group's choice of ethnic image. Predictably under these circumstances, one finds a prestigious ethnic identity manipulated and guarded as a scarce and valuable social commodity. For example, in the Doukoloma area in Mali, Fulbe of well-established lineages have a higher social status than Fulbe from other lineages and Bambara. Public opinion holds that the "noble" Fulbe are generally richer, more intelligent, and better looking than the ordinary Fulbe, the Forobe Fula (herders descended from the war captives of the 18th and

19th century Bambara kings of Segou) and the Bambara. This prestige enables "noble" Fule to enrich themselves by judicious marriage alliances with other Fulbe. The ordinary Fulbe, the group which a Bambara farmer might join if he accumulated the hundred head of cattle which make transhumance a practical necessity, derive their prestige from association with the "noble" Fulbe, and hence defend the distinctness and superiority of Fulbe status against the Forobe Fula and the Bambara.[70]

Probably, if one could make a series of accurate censuses by ethnic group at ten-year intervals, one would find net population shifts from one group to another. Studies of this ethnic drift and the values and aspirations which motivate and regulate it would illuminate the dynamics of current cultural change. An understanding of how people change their ethnic identification when they migrate, whether from farm to city or from homeland to another rural area, is of crucial importance in planning resettlement schemes. "Natural experiments" in unplanned ethnic assimilation should clarify the cultural and social needs of people to be settled in planned communities.

Assimilation is one major theme in interethnic interaction, tending to blur or redefine ethnic membership, while at the same time maintaining ethnic boundaries by tacit acknowledgment of their validity. Competition and symbiosis are two other predominant types of interethnic relationship.

Which one of these two will predominate appears to depend primarily on the distribution of resources. The relationship between pastoralists and cultivators is a good example. Where land and access to sources of groundwater are plentiful, cultivators are content to trade grains and grazing space for the pastoralists' manure, milk, and meat. Where land is insufficient to meet cultivators' needs, or where they have begun growing cash crops and expanded their fields into former pastureland, and where waterholes are scarce, pastoralists and cultivators compete for the same resources and interethnic tensions mount.

Cutting across many ethnic groups in the Sahelian states is a form of social stratification by occupation. At the top of the hierarchy are the "noble" lineages—long established in high status positions, often descended from the rulers of previous centuries. Next come the "free men," whose ancestors have never been enslaved. At the bottom of the hierarchy are the descendants of slaves. In some areas these have disappeared as an identifiable social category. Elsewhere, among the Tuareg, for example, the descendants of slaves form distinct groups who may still act as servants or clients working for their patrons. Pastoralists often had cultivators as slaves, the reverse was much more rare.

Somewhat outside the noble-free-slave hierarchy are the occupational castes, of which the most common are woodworkers/blacksmiths/potters, leatherworkers, and bards/

musicians. These are endogamous groups which transmit from one generation to the next both specific skills and their associated mystical secrets. Found in all the Sahelian states and carrying different names in each ethnic group, they carry out parallel functions in each society which hosts them. In previous centuries they were widely immune to enslavement. The practice of a craft usually does not preclude cultivation, although one finds some communities which exclude members of certain castes from access to land. For example, some Bambara have traditionally denied blacksmiths and bards the right to cultivate. In other areas, blacksmiths especially tend to be better off than many other farmers because this specialized source of income is in addition to the usual returns from farming. Blacksmiths are crucial to the maintenance, and sometimes the supply of farm equipment, whether it be traditional hand hoes or plows, cultivators, and carts with metal parts. They also are often thought to have special powers of healing, and sometimes of magical destruction. Other skills like weaving, dying, housebuilding, and the like are in some societies the specialty of certain lineages and in others simply available to whomever wants to learn and practice them.[71]

Finally, one finds in many areas of all the Sahelian states a series of clerical lineages, called marabouts by the French. These lineages claim as their special identity a strong commitment to Islam and, in many cases, a tradition

of literacy in Arabic, Islamic learning, and a kind of missionary orientation in areas where the general populace does not practice Islam. The Muslim clerical lineages are very important determinants of the cultural life in areas where they have established themselves. They run a variety of schools which are a popular alternative to the French language educational system. They give advice on many topics including health care and personal conduct. Most people believe that they have magical powers to protect and restore (and destroy) health and to influence the course of events generally.

The traditional distribution of skills as it survives in each community is an important resource to be developed. West African blacksmiths brought their skills, as slaves, to the American South and did the metalworking for the farm society. When the famous Dyula leader Samori led his armies to resist French occupation at the end of the last century, they used guns made by local blacksmiths copying European models. Several sources mention the lack of an effective repair network as being an important hindrance to the spread of animal-drawn farm implements. Surely the local blacksmiths, given the proper opportunity, could develop their skills and form a very effective repair network for farm implements designed with their capacities in mind. The clerical lineages are likewise a very important resource. Given some education by authorities whom their culture would

predispose them to accept, professors from al-Azhar University in Cairo, for example, they could be invaluable popularizers of better child care techniques, health practices, and the like.[72]

Within each ethnic group or caste one finds specialization of labor by age and sex. Children are an important segment of the agricultural labor force, yet very little research has been done to clarify the exact nature of their contribution. Tasks commonly assigned to them are caring for younger children, running errands, herding animals, keeping birds and other small animals away from crops, and the like. They may also work alongside adults in the field and in activities like gathering manure and firewood. Schools, of course, remove children from the labor force and often encourage students to develop non-agricultural aspirations.[73]

The timing and conditions under which children take on adult agricultural roles bears some investigation. Initiation ceremonies marking the transition to adulthood seem to be on the wane. Changing family dynamics and household economics may diminish the role of senior males in obtaining wives for the young men in their lineages. How does the dissolving of the traditional structure affect young people's integration into the work force? In some areas female children marry as young as age 9-13 and go to live with their husbands' families. Male adolescents may experience

significant discontent with their role as very junior members of the family labor unit, and turn to migration in hopes of gaining independence. The workload, aspirations, and discontents of youths from puberty through young adulthood need to be explored.[74]

The sexual division of labor also channels human energy in definite ways. Our own cultural stereotypes have led many Europeans and Americans to believe that African women do mostly household chores and a little light work in the fields, while men are responsible for most of the heavy agricultural labor. This stereotype is misleading in two ways. First, women's household labor is both arduous and vital to the very survival of the community. It includes, besides child care, food preparation, gathering wood for the cooking fire and hauling water. All of the staple grains eaten in the Sahelian zone states—millet, sorghum, rice, maize—must be husked or ground into flour or both. The women do this with a large mortar and pestle; it is both time-consuming and tiring. Hauling water and firewood are also both very taxing activities. The water is often far below the ground, especially in the dry season, and the well or water source may be some miles from the village. Deforestation around many villages increases the distance women have to go for firewood as well.[75]

Furthermore, these household tasks are only a kind of basic minimum in a woman's laboring day. Estimates of the

percentage of direct agricultural labor carried out by women range from a third to well over half, depending on the demographic structure of the village and the tendency of men to migrate. In Mali in the 1950s 16 percent of families were headed by women. Women work both on their husband's family fields and on fields allocated to them personally. The care of small livestock often falls to women—feeding and watering them and making sure they don't stray. In many pastoralist villages and camps, women are responsible for the milking. Women also make many objects for household use themselves—spinning thread, weaving mats, making pots. In societies with occupational castes, the women of blacksmiths are potters and the women of bards are also bards. In building and repairing houses and graneries women sometimes work alongside men, sometimes have their own tasks.[76]

Finally, in areas where markets have developed, women are often active participants. They extend their food preparation skills to processing and preparing foodstuffs for sale—roasting or grinding peanuts, drying tomatoes and peppers, deep frying fritters of various kinds, preparing dried balls of condiments for different sauces, making curdled milk and cheeses, brewing fermented drinks. Many women also market themselves the produce from their personal fields, and they may be responsible for selling some of their husband's produce as well.

Men work in the fields, herd the larger animals like cattle and camels, and engage in many craft and marketing activities. In theory the head of the family (usually a male) is in charge of and the main source of labor for the production of whatever commodity or service the family depends on for its subsistence--whether it be a good crop, cash crops, or a craft or other activity. In practice, of course, women often provide a large proportion of the labor which allows the family to sustain itself. Male cultivators tend to reserve for themselves certain tasks, varying from society to society, which require either great physical strength, like cleaning a field of stumps and old roots before planting, or the use of special tools, like planters, axes, or plows. In general, African men and government agencies both in Africa and elsewhere have cooperated in keeping technological development in the hands of men. Plows, chemical fertilizers, and insecticides have become the special province of men, even though women could put this technology to equally good use.[77]

How family members dispose of their labor also depends upon patterns of resource allocation within the family, the returns which people can expect from their productive activities and the resources they have to work with.

Access to Family Resources—Land, Produce, Livestock, Income

The allocation of family resources and the budgeting of personal and family income shape each farmer's strategies

for maintaining an optimum personal environment. Patterns of land ownership and rights to cultivation would seem to be an important influence on farmers' readiness to invest in soil preservation and enrichment, though the evidence for this is fragmentary and the question requires further research.

In general, traditional systems of land ownership and allocation seem to have reflected more the social authority of the lineage heads or religious figures who gave permission to use the land than the need to distribute a scarce resource. Authority over land distribution varies from culture to culture. In some areas one finds "earth priests," men with a special religious relationship to the land, responsible for interceding with the appropriate gods or spirits before previously unfarmed land can be cultivated. An example of these figures is the Mossi Tenga Soba, each with the territory which he oversees in the name of Wende, the Mossi life force as manifested in the earth. Any one Mossi village may cultivate land in the regions of several Tenga Sobas, one Tenga Soba may be responsible for land in several villages. This authority structure is separate from the rest of the political structure, whose traditional local representative was the Tenga Naba. Authority over the land, whether as a "first owner" in some sense or as an intermediary between the cultivator and the non-human world is often independent of whatever remains of the pre-colonial

political-military structure. Among the Serer, for example, land belongs first, in theory, to the yal o niaye, matrilineal descendent of an ancestor who purportedly first cleared it with bush fire. He in turn allots it to the lineage heads in each village, the yal bakh, who allocate it among the various households. In other societies, such as the Bambara, the allocation of the right to cultivate is traditionally the prerogative of the ruling lineage, or lineages, in each village.[78]

In most societies the distributor of the land received only ritual acknowledgment of his "ownership"—an annual gift, perhaps, but of financially insignificant proportions. With the expansion of a cash economy some ritual owners have tried to convert the traditional gift into either a cash rent or rights to labor. Governmental statutes have, at least for male heads of families, formalized the cultivator's ownership of land he cleared and works for himself. It is not clear how much income and labor still goes to the traditional allocators of the land especially if, as in the case of the Mouride Shaikhs, they can mobilize religious sentiment to support their claims.[79]

In spite of these scattered attempts to reinterpret traditional culture in order to support the beginnings of a landlord-tenant structure, the main thrust of most indigenous land-distribution systems has been to insure that each person has access to land on which to farm or to

pasture animals. The family which had more land than it could cultivate lent it to others, more or less rent-free. Even in many areas which have developed cash crop agriculture, land is still loaned or rented at very low rates.

Two conditions appear to contribute to farmers' reluctance to invest effort or money in soil conservation. The first is the availability of fresh, uncultivated soil where it exists. The Mouride shaikhs, for example, have been totally uninterested in learning and applying soil conservation methods because they have found it easier and more profitable to apply political pressure on the Senegalese government to get permission to move into classified forest reserves. Migration may seem more expedient than fertilization.

The other condition inhibiting some cultivators' investment in the soil is their lack of permanent tenure. A Dogon man commented to one investigator that he would manure a field only if he knew that it would be his to cultivate the following year. This consideration probably affects women and junior males more often than heads of families in the Sahelian zone states. As a general rule (to which the Dogon example is an exception) land allocated to a household head remains his to cultivate, to assign to his wives and children to work as personal fields on a season by season basis, and to leave to his heirs; if he abandons it, it reverts back to the person who allocated it

to him. The wives and children may often be in the position of not knowing from year to year which fields will be theirs. Reports from Hausa women in Niger state that husbands, knowing their wives to be willing to put a lot of labor into manuring a field, assign to these women the poorest field each year. This practice contributes to the women's reluctance to invest in the long-term benefits of chemical fertilizers. Similar considerations lead tenant and migrant farmers to omit fertilizer, crop rotation, and other soil preservation techniques on the fields assigned to them. The pastoral Fulbe who borrow land from sedentary farmers often develop richer fields than their hosts—but their bargaining position with the sedentary farmers usually allows them to use the same fields year after year.[80]

In some areas, among the Hausa in Niger, for example, women are beginning to gain permanent private ownership of some fields, either through inheritance or by purchase. This phenomenon may be more widespread than the literature would indicate, concealed by the general male-dominated patterns of land ownership.[81]

Different kinds of land within the same village are sometimes subject to different patterns of ownership. When a village has recently moved into dry-season gardening in lowland areas, the person who clears these fields may have more permanent rights over them and loan them less often

than the fields on which the traditional rainy season food crops grow.[82]

Complex patterns of owership rights also affect investment in tree crops. To whom do the fruits of a tree belong? To the person who planted the tree? To the owner of the land on which the tree grows? Do the interested parties' respective rights to the land change once one of them has planted trees? What if the trees preclude the growing of other crops on that land?

Cattle and smaller animals such as sheep, goats, chickens and guinea-fowl are often also subject to complex rules of ownership, guardianship, and allocation to specific purposes. Often the owner of an animal is not the one who cares for it on a daily basis or even the one who realizes certain of the benefits from it. Both Fulbe and Serer women, for example, may "own" cattle, but the supervision of these animals is in the hands of the father, the husband, or the maternal uncle. How much control a woman has over the disposal of "her" cattle varies from society to society. The benefits of an animal do not always go to its owner. Fulbe women milk some of their husbands' cattle and pocket the proceeds of the sale of dairy products. A Hausa woman who keeps her sheep and goats penned in the courtyard finds that her husband claims the valuable manure dropped in <u>his</u> courtyard. Women may be asked to care for poultry which they do not own.[83]

Just as the patterns of ownership of land, animals, and perennial tree crops influence people's willingness to invest their own energies and other resources in making these productive, so do the patterns of family budgeting. Three questions are of primary importance in understanding household budgets. First, what is the return an individual can expect for his labor? Second, what needs and whose is he responsible for satisfying with that income? Third, what are the cycles of exchange, what are the groupings of goods and services which can be exchanged for one another?

One must never make the mistake of assuming a unified family budget along the lines of the cultural and legal norm for middle-class American families. A more accurate model can be derived by examining separately each family member's income and the expenditures for which he is responsible. Cultural differences overlap with the varying effects of participation in a cash crop economy to produce a wide variety of household budgets. Usually, one finds a family field or fields. Which family members work on it? What percentage of their time? In circumstances of peak labor demand, do the needs of crops on this field take priority? Does this field produce food crops or cash crops or both? Who markets the cash crops? Where the family head pockets the cash proceeds from the family field, what expenses must he meet with this money? Taxes? Food? For whom? Clothes? Bridewealth for his sons? Gifts on ceremonial occasions

(usually a large expense)? Religious tithes? School fees? Payments on loans for seed or equipment? What rights do the other family members have to determine the expenditure of that income? If the field produces food crops whom does it feed? Who distributes the grain?

Are there other communal fields to which individuals must contribute labor? Sometimes the lineage head has a field or there is a village field which each individual works for a set period of time. What benefit does a farmer derive from working on such fields?

In addition to a family field and sometimes other communal fields one finds more and more individual fields, cultivated by wives, unmarried sons, and sometimes by the head of the family as well. Who determines what crops shall be planted in these fields? What obligations govern the way in which the cultivator disposes of the harvest? If she plants food crops, whom must she feed? If she plants cash crops, what must she pay for with the proceeds? In some families wives must feed themselves and their young children for at least part of the year with the produce from their personal fields. In others, the husband provides the grain for the staple dish and his wife must provide the condiments.

Planting and marketing patterns and spending patterns affect one another in a variety of ways. If there is not a market for food crops then these occupy a sphere in the

household budget separate from cash crops and people may treat their resources in these two spheres in quite distinct ways. In Hausa communities in Niger, for example, the head of the family rations the millet from the family fields, making sure if possible that a sufficient portion remains stored until planting time to feed the family work force through the growing season. Proceeds from the sale of cash crops, on the other hand, disappear rapidly—there is no question of setting aside cash at this point to buy food. Taxes take a large bite; the repayment of debts and the purchase of clothes and large numbers of gifts necessary to retain one's status in the social network absorb the rest of the sum. If the food crop has not been large enough to feed the family throughout the year, family members must engage in crafts, commerce, or wage labor to feed themselves throughout the dry season. Irrigated dry season gardens also help to even out the year's agricultural income.[84]

Another way of looking at this phenomenon is to analyse the socially accepted patterns of saving and spending. Social status in the Hause community depends in large part on the gifts one is able to make at naming ceremonies, marriages, funerals, the annual Muslim ceremonies, youth festivals, and the like. On these occasions one spends what cash one has, and hopes that later opportunities for income will enable one to meet one's later needs. In this milieu savings are often in the form of food in one's granary or

animals, rather than cash. Many families were able to survive the drought because their women had accumulated sheep and goats which could be sold for food. Jewelry, cloth, enamel ware, dishes and other storable consumer goods, convertible into cash, are also forms of accumulated wealth.[85]

Insurance is an important consideration in the management of resources. Maintaining one's position in a social network may be as important a form of insurance as savings. For example, a Hausa family head who must arrange a ceremony for naming an infant, marriage, or funeral, can count on gifts from the members of his social network to help defray the heavy expenses he will encounter. In Hausa men's age-based mutual aid groups members are obligated to honor a needy member's request for food. Considerations of both security and prestige encourage socially-oriented spending as well as private savings. The channeling of different forms of wealth into these different activities will influence the areas in which people are willing to invest labor and other resources.

The different property rights, family responsibilities, and social and psychological experiences of men and women also influence their financial strategies.

The Position of Women

Changes in the nature of the family as an economic unit and the growth, in some areas, of opportunities for women

to earn an independent income have had far-reaching implications for family stability, for the financial strategies of family members, and for male-female relationships in general. The tendency towards individualism appears to be cumulative. This process could be described as an emancipation of women but insofar as it is often an "emancipation" without certain social, legal, and financial supports it may simply be an imposition of new kinds of burdens. All of these rather fundamental social changes are taking place in the context of a potentially and often actually conflictual relationship between the sexes, as women strive to gain and maintain their autonomy and men search for ways to maintain their political and economic dominance.

The psycho-cultural aspects of this struggle are insufficiently explored and of critical importance to social planning. The scanty evidence which exists suggests that at least in some cultures the bond between mother and son is emotionally more important than the bond between husband and wife, and that the former interferes with the latter at a variety of levels. Heterosexual relationships between members of the same generation—spouses and potential spouses—are frought with distrust, manipulation, and a general tendency on the part of males to try to keep the upper hand. An investigator among the Mossi reported that Mossi men consider women to be "recalcitrant and intractable"

—so different from them that no mutual understanding is possible. The Sunjata myth, the still-living epic tradition of the Malinke peoples, portrays Sunjata's mother and sister as the source of his extraordinary powers. A crucial episode in the myth is Sunjata's father's sexual conquest of Sunjata's mother; he overcame his impotence by threatening to kill her. To what extent is sexual activity a matter of masculine conquest, feminine seduction, and simple procreation, rather than the emotional core of a well-developed love relationship? The practice of clitorectomy and habitual lack of foreplay, among the Mossi, for example, suggests a certain lack of concern for women's sexual satisfaction. These very sketchy impressions suggest some of the psychological and emotional dimensions of heterosexual mistrust, which affects both the nature of family life and economic behavior in situations requiring heterosexual cooperation.[86]

This lack of trust between spouses, compounded by continuing male aspirations to polygamous marriage, and the ease of divorce, mean that a woman may not be able to find security in her relationship with her husband. Surveys indicate high divorce rates—over half the men and women in a Hausa sample had been divorced at least once. It makes sense, therefore, for a woman to seek to provide for herself economically—either by pressuring her husband into making large gifts which she can store in the form of consumer goods which she will take with her if the marriage breaks up,

or by enlarging her own sphere of economic activity.[87]

Several factors restrict rural women's opportunities and abilities to participate in the cash economy. First is the labor required in childbearing and domestic chores—child rearing, food preparation, gathering firewood, hauling water. If the distance to the well is far, hauling water can take hours out of a woman's day. The process of preparing the main meal alone can take at least several hours. Having to nurse a sick child can occupy most of a woman's time, though on an irregular basis. The possibilities for intervention to lighten women's domestic loads and free them for more productive activities are many. Well-digging and water transport, reforestation, or the provision of another fuel (solar energy?), mills for grains, better health care for mothers and children, are a few examples.[88]

Other limits on women's activities arise from the traditional division of labor and men's determination to reinterpret that tradition in such a way as to put most of the new technology in male hands. For example, the women of a Hausa village in Niger decided they needed a new well. They began taking up a collection among themselves to pay for it, but before they had gone very far with their project the men asserted that well-building was their prerogative, and organized and carried out the project using female labor only to carry the sand and gravel for the cement. Similarly, women in another Hausa village who had organized themselves

and obtained a mill for their village had to pay a male miller—once the food processing became mechanized the process was in male hands. Even in areas where women have traditionally contributed much of the labor, like agriculture, they find themselves excluded from opportunities. Men may assign them the poorest fields, and refuse entirely to allow them lowland gardens for irrigated dry season agriculture. Land tenure and inheritance patterns in general tend to discriminate against women.[89]

Women also lack legal and social supports for their efforts to achieve autonomy and development. Fewer women than men have attended school, so their literacy rate is lower. Agricultural extension workers have been almost exclusively male, communicating only with other men. Village cooperatives have been male organizations. Women have little if any access to agricultural credit, extension services, coop sales of mechanical fertilizers, insecticide, and special seed, and animal traction. In the domestic sphere, though a woman may divorce her husband as well as he be divorced by him, she may lose her children as well, in areas where the law allows him custody. With divorce she may also lose any investment she made in her husband's land, such as fertilizing or the planting of tree crops. There is no concept of joint property, increased by the cooperative efforts of both partners in the marriage, and divided when they separate.[90]

Finally, women themselves may lack the confidence, the inspiration, and the social cohesion necessary to work in an organized way towards changing their conditions of production. At marriage, or at some point thereafter, a woman goes to live with her husband, perhaps in a household with co-wives and in-laws, women in a competitive relationship with the new wife. This competitiveness and women's movements from household to household with marriage and divorce may inhibit the formation of cooperative bonds among women. Female age-sets may be less active than the males'. Women may lack organizational experience. Class differences between women may also inhibit unified action—a woman who can afford to pay someone to haul water for her may have no interest in contributing to the construction of an improved well. The literature contains very little data on women's organizations and on the local level potential for women to become actively involved in their own development. This deserves much more study.[91]

The drought may have temporarily changed men's attitudes towards women. Observers in Niger reported that men expressed appreciation for women's resourcefulness in finding food for their families and that they were consequently willing to take a more positive attitude towards women's development. If one can compare this with the general historical pattern of the rise and fall of women's position in periods of social crisis, like revolutions, one would predict that this

appreciation will be relatively short-lived and will not by itself lead to long-lasting structural change.[92]

In fact, if the standard of living rises the structural change may move in the direction of further restriction of women's activities, as in the institution of purdah. This practice has spread in the twentieth century to most urban Hausa in Nigeria, for reasons which have not been adequately studied. If the standard of living rises in Niger will Hausa males there aspire to convert their wives into items of conspicuous consumption? The social model is certainly present, both in Nigeria and among the richer Tuareg in Niger.

Finally, the range of options available to women can be expected to affect their fertility. Fulbe in the Niger Delta area have had a much lower fertility rate than the other populations: 187.2 births per thousand as compared with a general rate of 213.1 per thousand. Gallais has suggested that this discrepancy results from the greater economic opportunities open to Fulbe women. Another researcher has claimed that as a general rule, fertility is in an inverse ratio to the power and life opportunities of women.[93]

The specific cultural, social, and economic dynamics of male-female relationships, and the particular problems encountered by women, as well as the solutions they have attempted, remain largely unexplored in the Sahelian zone

states. Women, both as cultivators and as keepers of animals, are a major source of farm labor to be either developed, technologically and socially, or lost. Women are also very active in crafts and food stuffs processing for local consumption, activities which could be developed into small-scale industries contributing significantly to the internal economy, helping it to be less dependent on imports. The importance of developing women's, as well as men's, skills and capacities is obvious; the dynamics of the male struggle for dominance, male opposition to anything which will increase the income and technological capacities of women, women's search for autonomy and the effects of this activity on both fertility and development need specific clarification.[94]

Changes in the relationship between the sexes are but one of many transformations of social relationships which accompany economic and technological change.

Transformations of Local-Level Class Structure

Technological and economic change is contributing to a widening gap and increasing conflict of interest at the local level between the not-so-poor and the very poor. The local-level upper class which is emerging includes both outsiders who have settled in or near the village and gained powerful economic positions, and indigenous village leaders who have been able to consolidate positions of economic

control. Evidence from several areas illuminates the ways in which, as cash becomes more important as a definer of human relationships, indigenous local leaders are able to use their prestige and traditional authority to increase their economic resources. Historically, ascribed status at the local level has several sources. One is primacy of settlement, descent from the founding lineage of a village. Another is illustrous ancestors, descent from a lineage whose members held political or military power at some time in the past. History is a live issue for many, if not most, peoples in the Sahelian zone states. A third source of high status is religious prestige, which may be ascribed or acquired or both.

The expansion of the cash economy during the colonial period and after has meant not only the geographical spread of cash crops and cattle sales, but also the intrusion of cash into more and more social interactions. Exact data on the extent of this spread are not available. In many villages observers report that one must have cash to participate in local social life. Villagers define and re-affirm their social relationships continually with gifts on one occasion or another. Formerly some sort of produce, most of these gifts are now cash, or items which must be purchased with cash. Furthermore, people have been re-evaluating their social assets with an eye to cash value. Land, labor, and family prestige are examples.[95]

There are very few studies on changes in the size of landholdings over time, but what evidence there is indicates a gradual increase. A study of the Fulbe village of Severi in the Niger Delta showed a striking redistribution of land from 1948 to 1958. Although this study is old, the process it documents is likely to be current in many areas. In 1948 about a third of the village population cultivated about a third of the village land, divided into plots of 1 to 1.5 ha. About twenty percent of the population cultivated nearly another third of the village land, divided into plots larger than 1.5 ha.; and about half the population cultivated the last third, divided into plots smaller than 1 ha. By 1958 the amount of village land cultivated in plots larger than 1.5 ha. had grown to 38 percent, in the hands of a diminishing number of farmers, 15 percent of the population. Less land (20 percent) belonging to fewer people (about 15 percent) was in plots of 1 to 1.5 ha., while about 70 percent of the population cultivated only 40 percent of the land, in plots smaller than 1 ha. Twenty percent of the population in 1958, as compared with none in 1948, had plots of less than 0.3 ha. or no plots at all. Studies of landholding in Senegal suggest that similar dynamics have been in operation there, for in the areas of greatest groundnut production—Baol and Sine-Saloum—one finds more large landholdings, mostly owned by merchants who live off the rent. More than 80 percent of all

landholdings are cultivated by people unrelated to the owners.[96]

The attempts of lineages with traditional rights to distribute land to convert their yearly ritual gift into a more economically significant rent are important in this context. Recently cultivated types of land, like lowland gardens, may be more or less subject to preemption by prestigious lineages, depending on the local landholding traditions and how they make themselves felt.[97]

Even less data is available on the ability of high-status households to attract either unpaid or very low-paid labor. Muslim leaders often have pupils and followers work for them on their fields in return for schooling or as a demonstration of religious devotion. The Mourides are simply the best-known and most developed example of this widespread practice. The Severi village study cited earlier speaks of an obligation on the part of lower status families to contribute labor to members of the aristocratic lineages. Higher-status households may have a greater ability to convene work groups too. Since some agricultural tasks require a group to complete them, certain kinds of projects are simply out of the question for poorer farmers.[98]

Marriage as a means of accumulating wealth is probably more common among big livestock owners, who exchange valuable animals, than among cultivators who usually exchange only consumer goods. An aristocratic Fulbe can command many

cattle from a rich man of a less prestigious lineage who wants to marry his daughter.

The introduction of new agricultural technology and new institutions like cooperatives and political parties seem to make the acquisition of wealth by local elites more efficient and cumulative. Before these changes much of the power of indigenous authorities was social, and the associated wealth took forms which were prestigious, but did not affect the productive organization of the village. Larger houses, bigger granaries, more gold jewelry, social prominence, even bigger families, did not transform the structure of economic activities.

If a not-so-poor farmer invests in new technology, like animal-drawn cultivation equipment, his economic relationship with his fellow-villagers takes on new dimensions. First, he can cultivate more land than they can, and therefore he has reason to try to increase the size of his fields. Second, he can work others' fields in return for labor on his own—he may work half a day with his equipment in return for food for himself and his animals and a day and a half, perhaps, of hand labor on unmechanized tasks like weeding and harvesting. The labor requirements for these tasks are the main factor limiting the amount of land a family with animal-drawn equipment can cultivate. The farmer who must repay the owner of the equipment may therefore have to do so just when his own fields also need

attention. The local notable who can afford to buy animal-drawn equipment combines this new resource with his usually larger family, his traditional claims on the labor of others, and his influence on the distribution of land to expand the productivity of his enterprise at the expense of others. In the Severi village study discussed above, the largest landowners were the owners of animal-drawn equipment who were also historically members of the highest-status lineage in the village. Families who gained use of the animal-drawn equipment in exchange for their labor had, in 1958, a smaller average area under cultivation than those who used the daba, or indigenous hoe. A study in a Hausa area in Niger reported that prominent farmers there were buying animal-drawn equipment not so much to increase the size of their own fields as to use the labor obligations engendered by mechanized work for others to create a body of debtor-clients. Such patronage increases one's social prestige.[99]

The objection to helping some farmers buy farm equipment in order to advance themselves is not the resultant inequality, which could simply be viewed as a reward for intelligent effort, but rather that these farmers are able to use the equipment to absorb the land, money, and labor of poorer farmers, leaving the poorer farmers with fewer opportunities than they had before.

Local elites also dominate cooperatives in many areas, transforming this new institutional form into a means of

enlarging their power by controlling the marketing of cash crops and the distribution of agricultural supplies. In Africa generally the well-to-do farmers, the local elites, have been the most likely to default on loans. Research in Senegal indicates that the government has been reluctant to risk the alienation of local-level elites by insisting on their repayment of government loans, and that members of cooperatives have felt restrained by kinship ties and traditional propriety from taking action against those who have defaulted on loans or embezzled coop funds. Political clout evidently brings immunity from certain financial obligations.[100]

Finally, the seasonal ebb and flow of production and economic life with its accompanying fluctuations in prices, gives a huge advantage to those who can afford to be creditors. Where there is a market in food grains prices are, of course, very low right after the harvest and perhaps two or three times as high during the "hungry period," when people are working hard in the fields. A poor farmer must sell when the market is low to pay off his debts, and buy in even higher-priced small quantities in a rising market as he scrapes together the cash for his daily food needs. He may also have to plant a fast maturing but low yield variety of millet to get through the hungry season. Before the expansion of the cash economy, large communal granaries insured against this problem in many areas. Now storage is largely for

profit, and widens the gap between rich and poor.[101]

Agricultural supplies and equipment, often distributed at less than cost in development programs, enter the market in ways not intended by the distributors. Poor farmers end up exchanging or pawning equipment and supplies for food, sometimes at less than the price they paid. Forced to sell farm equipment and animals to merchants or wealthier farmers, they then must rent these items back in order to cultivate. Natural and economic crises such as drought and falling prices for farm produce create exceptional difficulties for the poorer farmers, depleting any reserves they may have had and trapping them in a vicious cycle of indebtedness that may cost them their land. This periodic re-impoverishment of the poor may be a significant brake on rural development.[102]

It is not only elites indigenous to the village who have been consolidating their economic status at the expense of the poorer, less prestigious families. Newcomers to the village, merchants and people sent there by the government at one time or another, also take whatever opportunities they can find to build up their wealth and local power. They begin, of course, with assets in the form of capital, expertise, or political influence from outside the village, which may make up for their lack of ascribed status in village life. Sometimes outsiders find it an advantage to be more independent of family obligations and to buy up land and employ wage labor. The Office du Niger has also found local

entrepreneurs eager to speculate in this fashion with its land.[103]

Sometimes the relationship between local elites and the poorer members of the community involves a variety of mutual obligations, expectations, and benefits. The participants' understanding of their situation may differ from that of an outside observer. Patron-client relationships in the Sahelian zone states take a wide variety of forms, some of them more exploitative than others. An observer in the village of Kita in Mali reported that after the government established marketing cooperatives, villagers remembered mainly the advantages of their previous relationships with the African middlemen. The trader was a source of credit and a patron who would intervene on one's behalf with government authorities. Interest rates were apparently not so high as to lead to long-term indebtedness.[104]

In Senegal, the leaders of Muslim religious brotherhoods often appear to their followers to be in a more or less benevolent role—giving credit at lower interest rates than the merchants and protecting the farmer if necessary from the police, the courts, and other authorities, and helping him find non-farm employment. The actual economics of the shaikh-follower relationship are obviously difficult to research but studies have indicated that shaikhs give alms with more attention to their own prestige than to providing for the welfare of their poorest followers. The

shaikhs may receive from a tenth to a fifth of the income of their followers; poorer farmers on the average tend to give a larger proportion of their income than the richer farmers. Measured on a strictly economic basis, the tithing and alms of the brotherhoods are not an effective social security system.[105]

Whether a particular patron-client system is an aid or a hindrance to development depends upon many factors—the economics of the relationship, the participants' own estimations of costs and benefits, social and religious as well as economic, and the participants' view of possible alternatives. In areas of Niger where the relationship of Tuareg patron to his ex-slave clients is still a widely accepted social form, an enterprising patron may form a "cooperative" which he runs very efficiently and through which he gets technological and material aid which actually does raise both his standard of living and that of his clients. On the other hand, many "cooperatives" run by patrons are simply instruments of disillusionment and alienation. Each case must be analyzed on its own merits.

Conclusion

An analysis of human resources for agricultural development must consider not only how to engage labor in more productive activities but also the social and cultural context of people's lives. Development endeavors are likely to affect many aspects of people's existence, sometimes in

unexpected and undesirable ways. In its most positive sense, development implies the development of people in a social context, the enhancement of their capacities to survive in a fragile environment and to create satisfying lives for themselves. This paper has outlined, in the specific context of the Sahelian states, a series of questions about rural life which should be of special concern to development planners and facilitators at all levels.

(1) How important are strictly economic profits as opposed to other values in each culture? Evidence suggests that a wide range of perceptions of and responsiveness to economic incentives depends upon cultural attitudes in many spheres and the historical significance of cultivating and herding in each society. Farmers' more recent experience of the market—prices, the availability of goods, social relationships between buyers and sellers—also influence their willingness to produce goods for sale.

Taxes, rather than the voluntary attempt to acquire money to buy things, have often been the main motivation for cash crop production and sales of animals. The burden of paying taxes has also precipitated the fragmentation of lineage labor units. The real profitability to farmers of production for the market needs to be examined.

(2) What social, cultural, and religious values do people assign to agricultural products and processes, and

how does this affect agricultural behavior? Cattle and millet, for example, often bear such values in the Sahelian states, with important consequences for the way in which farmers allocate their labor and dispose of these crops, animals, and animal products. People's attitudes towards the accumulation and distribution of wealth also vary widely from culture to culture and affect their economic behavior.

(3) How do farmers conceive of and utilize their environmental resources? A people's knowledge of their ecology and strategies for surviving in a particular environment form an important human resource. Ecological patterns and social structure are intricately linked. Of particular importance are the specific agricultural and social practices which enable farmers to meet their own nutritional needs. Neighboring peoples are often either competitive or symbiotic with one another in their use of natural resources, changes in one group's activities will affect the other.

If the Sahelian states are to become more productive, land use in many areas must become more intensive. How to facilitate this in areas where mobility has been the usual mode of adaptation to environmental poverty and unpredictability is a major problem. Careful study of the evolution and fate of indigenous intensive agricultural systems could provide some important insights.

(4) What are the various principles which structure

the organization of labor? Work groups usually fall into one of three categories: leader-oriented, lineage-based, and local age-based. Each has its advantages and weaknesses, both from the viewpoint of the participants and as vehicles for development. The intereaction between technology and the organization of labor is a major determinant of the effects of development projects.

The distribution of occupations and tasks follows lines established by ethnic identity, caste membership, sex, and age. The assignment of identity and appropriate work is more flexible in some cases than in others. Occupational specialization has created an important reservoir of expertise which needs to be developed.

(5) What are the patterns of household and family resource allocation? Access to land, control over income which one has helped to generate, and control over resources which one has improved, created, or acquired, such as land, trees, and animals, are considerations which affect each individual's decisions about how to invest his labor. A thoughtful analysis of household budgets and economic strategies would help clarify people's motivations with respect to agricultural activity.

(6) What can be done to facilitate the development of the female labor force? Accurate data on the proportion of agricultural labor supplied by women are unavailable for most areas of the Sahelian states; estimates run as high as

70 percent for the continent as a whole.

The available data suggest two major social trends affecting women. The first is the economic and social fragmentation of the family, allowing women more autonomy and less security. The second is the masculine effort to maintain and reinforce male dominance by controlling land and technology. Members of the two sexes may misunderstand and mistrust each other on many levels. Women's development needs to be encouraged in order to avoid a decrease in their agricultural productivity and to ensure that women have life options other than childbearing.

(7) What is happening to local level economic and political relationships as the use of money spreads and as new technology increases the productivity of its possessors? To what extent are those with initial advantages of prestige authority, or wealth, able to acquire more land and increase their incomes <u>at the expense of</u> the poorer members of the community?

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97. Pélissier, Paysans, p. 220; Gallais, Delta, I, pp. 293, 328; Lahuec, "Zaongho," p. 170.

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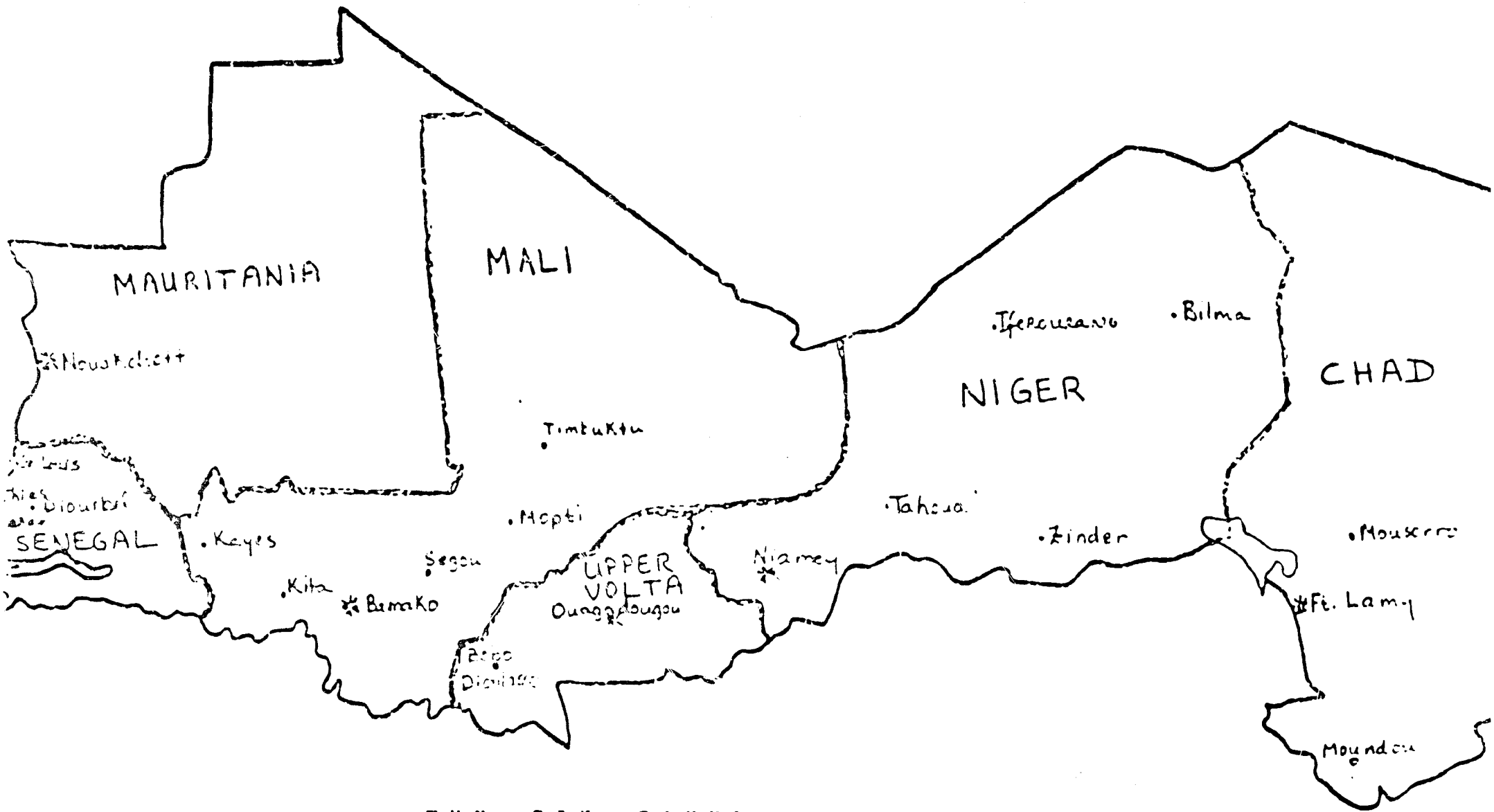
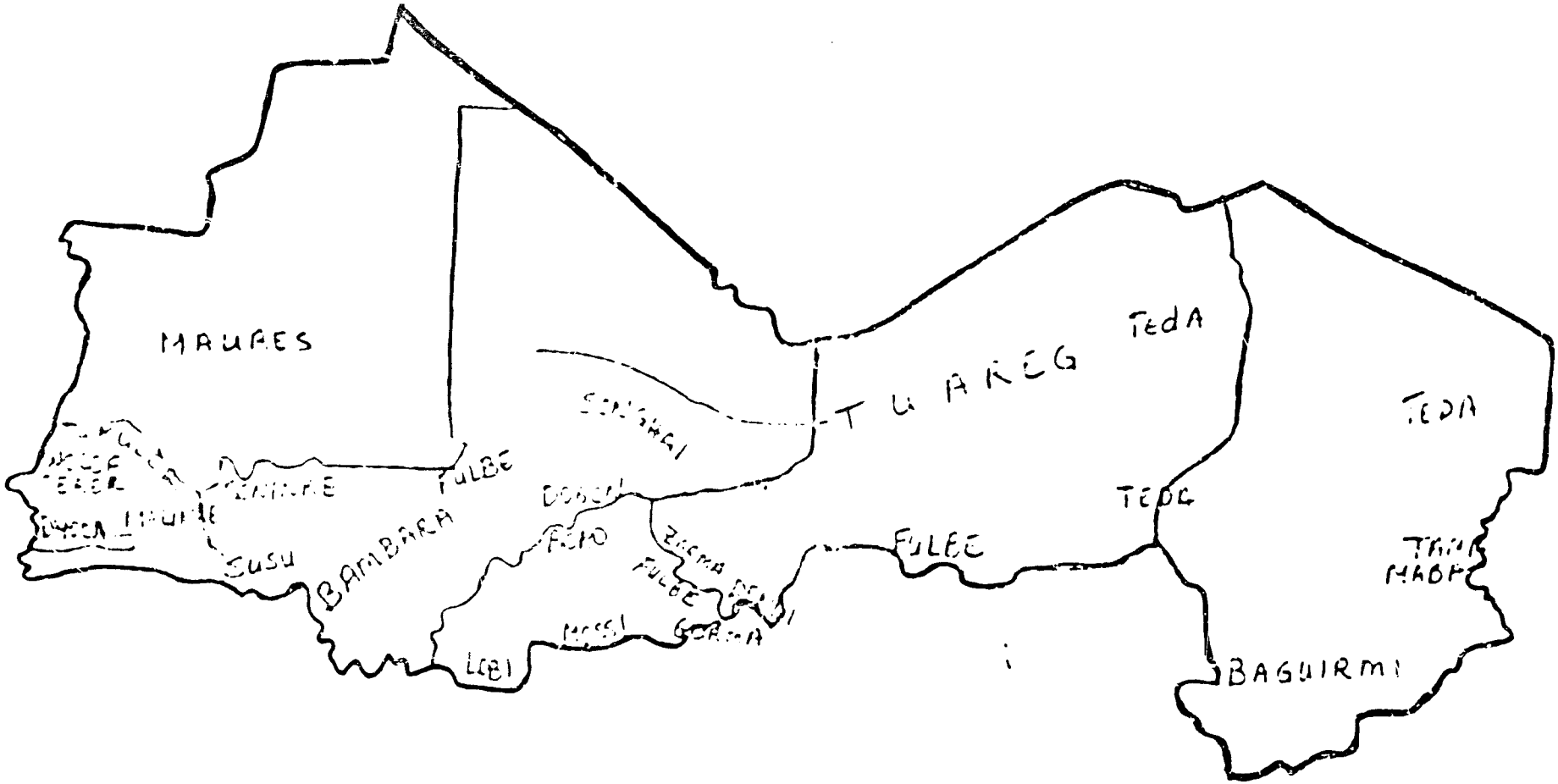
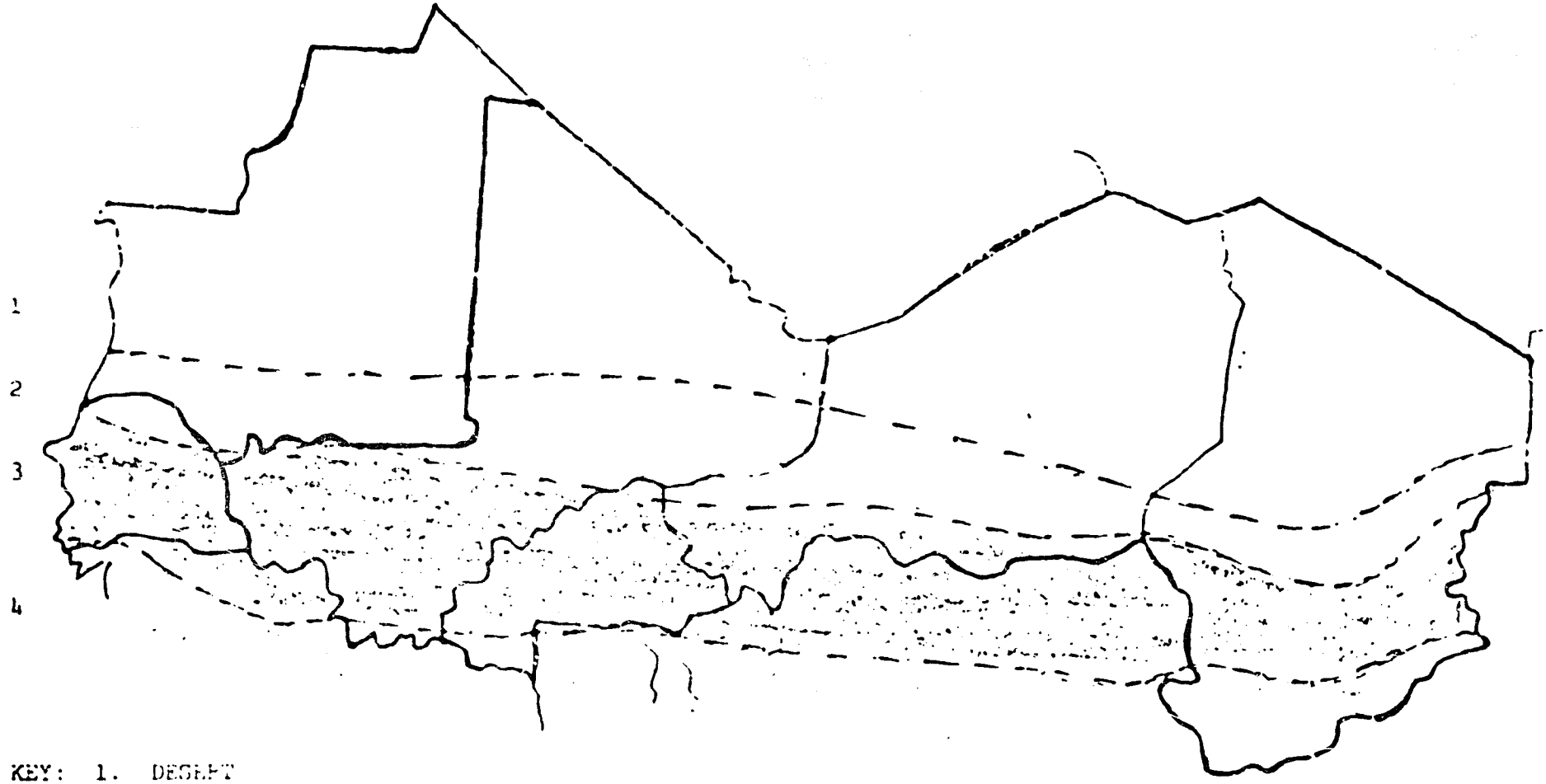


THE SIX SAHELIAN STATES



MAJOR ETHNIC REGIONS

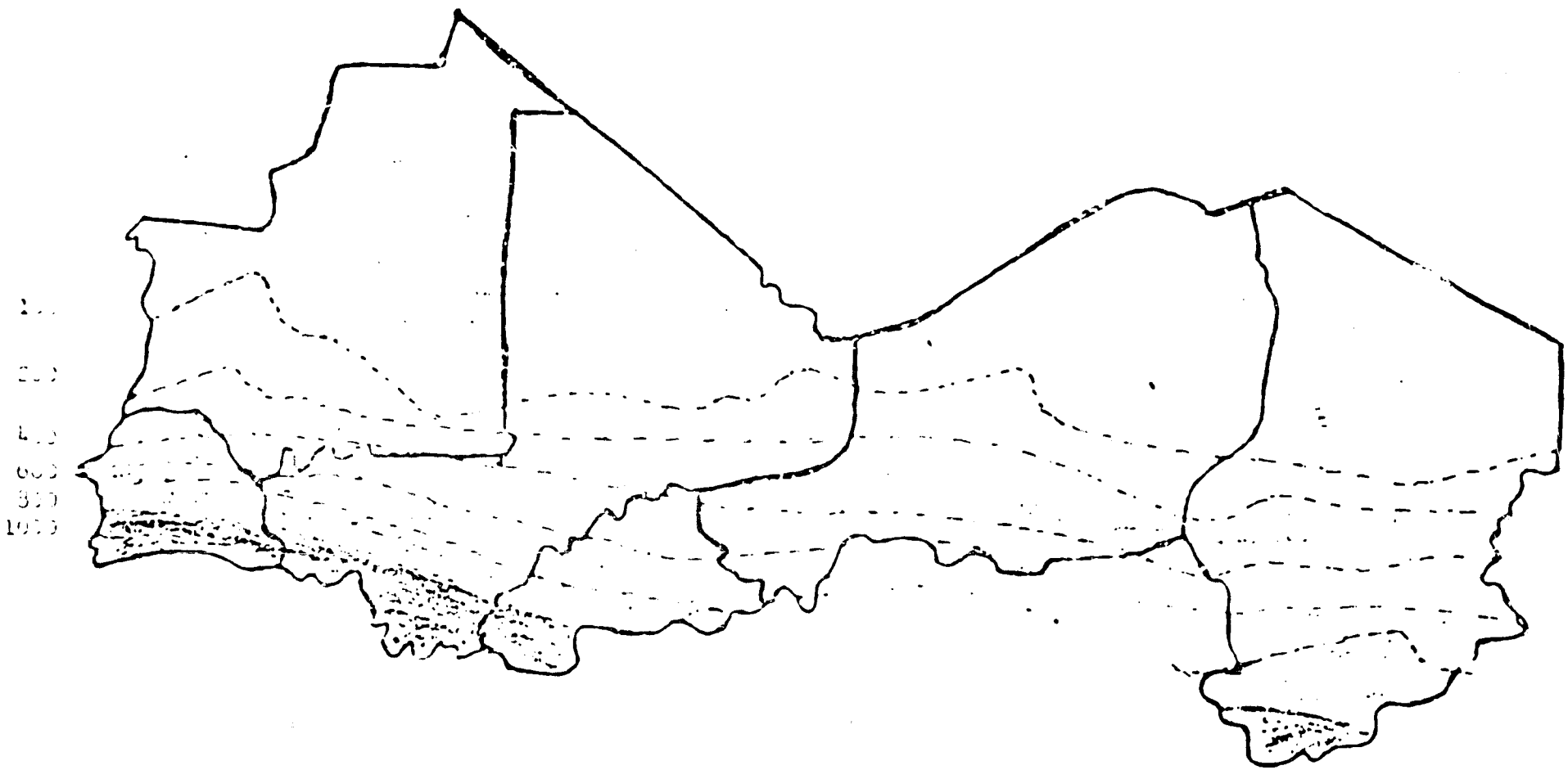
BROAD AGRICULTURAL ZONES

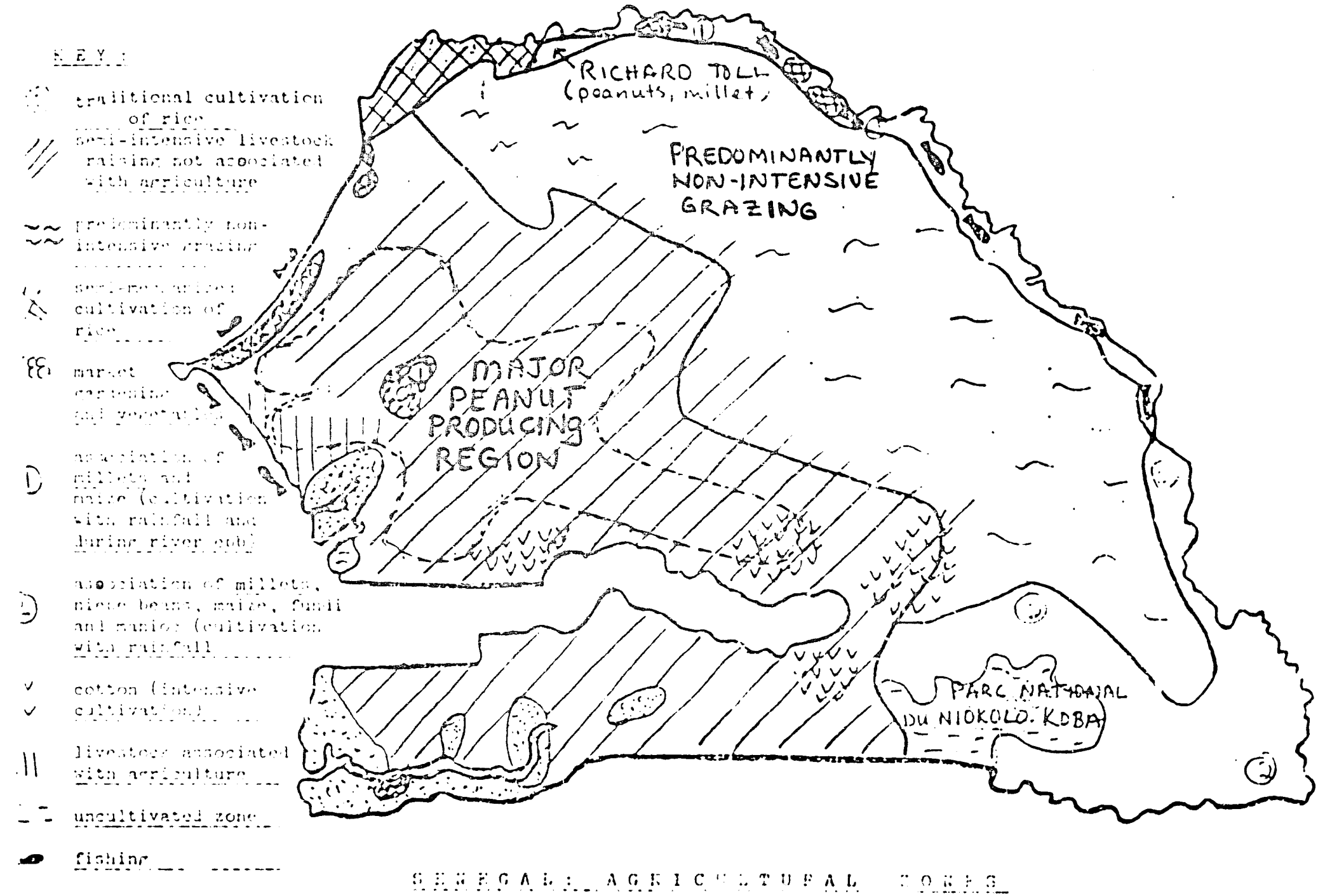


KEY:
1. DESERT
2. SAHELIAN ZONE: millets and livestock
3. SAVANNAH ZONE: millets associated with commercial plants (groundnuts, cotton) and livestock
4. SOUTH SAVANNAH ZONE: multi-crop subsistence farming (sorghum, peas, beans), Indimbutter and commercial crops (cotton, peanuts)

MEAN ANNUAL RAINFALL

(millimeters)





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