The Political Ecology of Peasant-Herder Conflicts in the Northern Ivory Coast

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Abstract. Following the great Sahelian drought of the early 1970s, an unprecedented number of Fulani pastoralists immigrated to the Ivory Coast with their cattle. Although welcomed by the Ivorian government for their contribution to national beef production, the Fulani’s presence has been bitterly opposed by Senufo peasants in the savanna region over the problem of uncompensated crop damage. I examine the nature of peasant-herder conflicts in northern Ivory Coast from a “political ecology” perspective and argue that it is at the intersection of Ivorian political economy and the human ecology of agricultural systems in the savanna region that one can begin to identify the key processes and decision-making conditions behind the current conflict. Micro- and macro-level processes involving the transfer of resources from Senufo households are considered to be central to the strife. The case study seeks to contribute to the growing literature on peasant-herder interactions in sub-Saharan Africa by viewing peasant-herder conflicts as “responses in context.” The political ecology approach provides a framework for human ecologists interested in examining the interrelationships between local patterns of resource use and the larger political economy. Data collected to analyze the nature of the conflict in the Korhogo region during a seventeen-month period in 1981–82 and 1986 include survey research questionnaires, pastoral and farm management studies, participant observation and interviews with peasants, herders and livestock development officials.

Key Words: peasant-herder conflicts, political ecology, crop damage, Senufo, Fulani.

OST studies on peasant-herder conflicts in sub-Saharan Africa focus on tensions resulting from farmers migrating into pastoral zones. Conflicts usually arise over peasants cultivating rangelands important to semi-transhumant pastoralists (Frantz 1975; Pelissier 1977; Campbell 1981). Tensions over pastoral land loss also exist in areas where farmer-herders and urban-based absentee cattle owners restrict access to previously open rangelands (Toulin 1983; Little 1987). In short, a declining resource base for pastoralism is viewed in the literature as the primary cause of land-use conflicts between peasants and herders (Gallais 1979; Hjort 1982). This dwindling land base model does not adequately explain why and how some groups gain access to land while others are losing their rights. Nor does this perspective explain why conflicts exist between peasants and herders in relatively land abundant areas like northern Ivory Coast and central Cameroon (Blench 1984; Boutrais 1986). This article proposes a different approach to the study of peasant-herder interactions that offers to answer these important human geographical questions. It argues that the “political ecology” approach, which emphasizes the politics of land use and the human ecology of agricultural systems, provides insights into the contexts and processes underlying peasant-herder conflicts and changing land-use patterns in sub-Saharan Africa.

In the case of northern Ivory Coast, tensions between Senufo farmers and Fulani herders center on the issue of uncompensated crop damage by cattle in peasant fields. The problem dates from the early 1970s when an unprecedented number of herds entered the northern savanna, a region where there have been few links between peasants and herders. During the past fifteen years, these conflicts have been expressed through a widespread xenophobia towards the Fulani as well as more openly hostile acts of assault, arson and murder. Some politicians have inflamed the situation by promising to banish the Fulani if elected. The most serious
peasant protests against Fulani pastoralists occurred during the spring of 1986 when an estimated eighty pastoralists were killed. The intensity of this most recent conflict led to the massive outmigration of Fulani families and their herds from some zones towards the Ivorian frontier.

Notwithstanding these conflicts, official Ivorian policy is to encourage Fulani herders to settle in the country. In an attempt to reduce its dependence on fluctuating beef supplies from Mali and Burkina Faso and on costly imports of frozen and chilled beef from South America and Western Europe, the government launched an ambitious livestock development program in the mid-1970s that included extension services and a sedentarization scheme aimed specifically at integrating Fulani livestock raising with peasant farming systems (Bernardet 1984). The Fulani’s contribution to national livestock production has been an unexpected boon to the economy. Between 1970–85 the number of Fulani zebu cattle increased at an annual rate of 10 percent, twice the rate of farmer-owned taurin cattle. The Fulani herd today accounts for one-third of national beef production (FAO 1986). But in light of the social unrest and the first serious signs of a return migration of Fulani herds to Mali and Burkina Faso, the Ivorian government is concerned about reducing conflicts in the north (SODEPRA 1981; Fraternité Matin 1987).

McCown et al. (1979, 301) have argued that in situations where land-use competition exists due to an area’s suitability for both agriculture and livestock raising, “relative political power is likely to determine the land-use pattern.” The implication here is that either peasants or pastoralists will control access to productive resources and that one or the other production system will predominate; it all depends on which group exerts greater political power. This situation may have been true during the pre-colonial period when access to and control of land was determined by indigenous land tenure systems but the formation of European colonies and, later, independent African states has led to situations where minorities enjoy certain political and economic rights that probably would have been denied to them in the past. Such is the case of the pastoral Fulani of Ivory Coast who only recently arrived in the country but who enjoy land rights despite the objections of the indigenous Senufo who are the custom-
The following case study of peasant-herder conflicts in northern Ivory Coast draws inspiration from Blaikie and Brookfield's interpretation of "political ecology" with its emphasis on the interrelationships between agricultural ecology, peasants and the state, and the accumulation strategies of different groups. It is argued that the Senufo rebellion against Ivorian livestock development policies, and the Fulani in particular, is a response to tensions emanating from pressures experienced by peasant households in the spheres of production and reproduction. These pressures, which are experienced at the household level as shortfalls in production and income, stem from both the precarious position of peasants in the Ivorian economy as cotton growers and the destruction of crops by Fulani cattle. The interaction of these and other determinants constitutes the chain of causality resulting in peasant-herder conflicts. In my discussion of the interrelationships among these causal factors, I have made use of the conceptual framework developed by Torry (1986) in his discussion of the "causal structure" of famine. Torry identifies four types of causes (or risks). "Ultimate causes" are structural or systemic in nature (e.g., surplus extraction by a non-producing class) which often create "predisposing conditions" in a famine situation. "Proximate causes" refer to more immediate and "situational" forces like debt and low food reserves. "Stressors," such as drought or high grain prices are often catalytic factors leading to distress which "counter-risks" (e.g., emergency food relief, livestock sales) seek to alleviate (Torry 1986, 6–10).

Table 1 outlines the basic determinants of Senufo-Fulani conflicts within this conceptual framework. Although it can be argued that the stress of crop damage alone is a sufficient condition for tensions between the two groups, it cannot by itself explain why the Senufo are driven to murder Fulani herdsmen. Determining what motivates individuals and groups of households to rise up against the Fulani (and by extension the state) is more complex. It requires an analysis of peasant-state relations and the dynamics of land use competition as much as crop damage.

A weakness of human ecological analyses of peasant-herder conflicts is their failure to address sufficiently the politics of land use. Despite the emphasis given to land use competition in explaining peasant-herder tensions, the political economic contexts from which these changing land use patterns emerge are poorly defined. Typically, one is presented with a descriptive check list of social and economic factors (e.g., population growth, expansion of cash cropping) which are summarily described as the reasons for land use conflicts. The political ecology approach, in contrast, seeks to identify the relationships between peasant-herder conflicts and the political economy of development and underdevelopment. By focusing on the processes and forms of peasant incorporation into extra-regional economies and the implications of this integration on land use, one can gain a clearer picture of some of the structural forces influencing peasant-herder interactions. For the purposes of this study, the following discussion of Ivorian political economy seeks to illuminate two "ultimate causes" of Senufo-Fulani conflicts: (1) the impoverization of peasants through excessive "surplus" appropriation, and (2) the policy of promoting Fulani livestock raising in the country.

Peasants, Capital and the State in Northern Ivory Coast

The model of economic development pursued in Ivory Coast since independence in 1960 has centered on a strategy of export-oriented, agro-industrial development in which the state, foreign capital and rural producers all play an integral part. The role of the state in this development strategy has been to encourage the expansion and diversification of export crops through its crop-specific parastatals and then to tax this increased production through its marketing board (Caistab). The revenues which accrue to the state have been invested in the expansion of agro-industries like textile plants and large-scale sugar and palm oil complexes. Foreign investors ranging from Japanese and American textile firms, Canadian sugar transnationals to former French colonial trading companies have been key partners with the Ivorian state in its various joint-ventures. Despite its preponderant share in the equity of the industrial sector (53 percent in 1983), the state is a minority shareholder in most firms. For example, although the state is a major investor in the textile industry, Japanese, French and American investors control all subsectors such
as spinning and weaving, pattern printing and clothing manufacturing.

Rural producers not only provide the state with much of its investment capital but they also help to subsidize the expansion of the industrial sector in other ways. Cotton producers, for example, have supplied the country's textile mills with their basic raw material and have done so at subsidized rates. According to the World Bank, in 1982 three textile companies received a $9 million subsidy from cotton growers through cheap fiber purchases arranged by Caidab. The parastatals play a critical role in extracting these surpluses. For example, CIDT is involved in nearly every phase of cotton production, processing and marketing (see Bassett 1988). Campbell (1984) shows that CFDT, the former French colonial cotton company which controls the marketing of Ivorian cotton under the aegis of CIDT, benefits more than producers from the expansion of cotton by inflating its operating costs for which it is reimbursed by Caidab. These costs have increased at a higher rate than producer price increases for a number of years. This control by foreign agribusiness of the downstream stages of export production helps to explain why cotton growers commonly receive just 25 percent of the world market price for their crop (Gbagbo 1983, 133).

Important intermediaries between the state, foreign investors and rural producers are what I have elsewhere identified as a "non-enterprising business class" composed of politically influential Ivorians who hold high-paying posts in the state apparatus and who also consult as "inside advisors" to foreign firms operating in the country (Watts and Bassett 1985, 11–14). The main avenue to obtaining lucrative positions in the Ivorian bureaucracy is through loyalty to and advancement in the one-party political hierarchy which is presided over by the country's only President—Houphouet-Boigny. In short, clientalist relations, machine politics and paternalistic rule have been the basis of both political stability and economic advance in the country since independence. But the current fiscal crisis manifested in debt payment suspensions, IMF austerity programs and a declining GDP threatens to shake the stability of the ruling party due to cutbacks in parastatal positions and subsidies formerly enjoyed by state employees. Illegal work stoppages, strikes and demonstrations by state employees over the withdrawal of housing subsidies and salary cuts in 1983–84 reflected the discontent of the potentially volatile urban population to government austerity measures (French 1983; Economist Intelligence Unit 1985).

The Ivorian economic crisis and the heavy taxation of rural producers are characteristic features of Third World agricultural-based, export-oriented economies. The balance of payments crisis is linked to the "disarticulated" structure of the economy characterized by few backward and forward linkages in its industrial structure and insufficient domestic demand for its goods (see de Janvry 1981, 7–60 for a more detailed discussion of "disarticulated" economies). Since economic growth is largely dependent upon foreign demand for its main exports (cocoa and coffee), the Ivorian economy is extremely vulnerable to the boom-bust nature of primary commodity markets. Record prices for coffee and cocoa in 1977 led to heavy borrowing at high interest rates to finance a wide range of development projects. Subsequent drops in world market prices, a series of currency devaluations, deteriorating terms of trade, and staggering debt-service ratios (up to

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Table 1. The Determinants of Peasant–Herder Conflicts in Northern Ivory Coast
40 percent), resulted in negative growth rates throughout the 1980s.

A second contradiction, which is more peculiar to the Ivorian economy, is the strategy of relying upon smallholder and peasant production for the bulk of state revenues. The government is faced with the delicate task of encouraging export crop cultivation at the same time that it heavily taxes this production. How has it managed to overcome this apparent contradiction? Thus far, the government has succeeded in its objective first, by its direct intervention in the sphere of production through parasitats, and second, by the institutional rents (input subsidies, extension and marketing services, research and infrastructure development) it offers to producers. This form of intervention in the production process is similar to what Bernstein (1979, 433) calls the "vertical concentration" of producers. Vertical concentration refers to "the coordination, standardization, and (greater or lesser) supervision of the production of numerous individual producers through a central agency whether this represents productive capital directly (as in grower and contract schemes), forms of merchant's capital which thereby actively intervene in the organization of production, or whether the agency is that of a co-operative or other state-managed scheme (e.g., 'development villages')." Ivorian parasitats like SATEMACI (coffee and cocoa), SODEPALM (palm oil) and CIDT (cotton) operate at the local level via their extension agents to provide a variety of support service to growers. In the case of cotton, CIDT extension agents supervise cotton cultivation by overseeing the delimitation of cotton fields and by regulating the distribution of credit, free seeds, pesticides and, until 1984, free fertilizers to growers. At the harvest, extension agents work closely with multi-village cotton marketing cooperatives which collect, weigh and arrange for the transport of raw cotton to CIDT's cotton gins. Yields are carefully monitored so that growers with consistently low yields are excluded from the cotton program. In short, cotton growers enter into arrangements with CIDT that are not unlike contract farming in which a central agency exercises considerable control over the production process of numerous individual producers. With the assistance of foreign finance provided by the Caisse Central de Coopération Economique and the World Bank, CIDT has succeeded in encouraging the expansion of cotton in the savanna region. But cotton growers have still experienced a steady erosion in their incomes during the 1980s due to inflation, recession and the end of the (100 percent) fertilizer subsidy in 1984. The World Bank estimates that real incomes declined in the country by 20 percent during 1982-84.

In an attempt to extricate itself from the economic crisis, the government has sought to restrict imports and expand exports to improve the balance of payments situation. The intensification of domestic food production is a major priority. Still dependent on foreign imports for more than half of its meat requirements (beef, pork, fowl, ovines and caprines), the government seeks to increase local livestock production. In terms of per capita meat consumption, beef is most important but domestic production covers only 22 percent of consumption. As noted above, Fulani herds account for one-third of domestic beef production and the government would like to see this output greatly expand (FAO 1986). But land-use conflicts between the Fulani and Senufo present a major obstacle to the realization of this development objective.

The following sections examine the nature of these conflicts at the local level. At this juncture, it is important to link this discussion of Ivorian political economy to the causal structure of peasant-herder conflicts. While stressing the economic role of the state and its intervention in the agricultural sector, the intention has been to lay bare the mechanisms through which surpluses are systematically transferred from rural producers to different groups. The fact that rural incomes and the standard of living have declined in real terms since 1980 indicates that current levels of appropriation are excessive for peasants. Crop damage, on the other hand, represents another and quite different form of "extraction." Stray cattle consuming field crops is not the equivalent of surplus appropriation through the vertical concentration of producers. Despite these different types of extraction, the end results are the same to peasant farmers, viz., reduced household income. In sum, one must link these systematic processes of resource extraction with the conjunctural forces culminating in uncompensated crop damage to appreciate the conditions of peasant-herder conflicts.

This focus on Ivorian political economy also
shows that impetus to expand Fulani livestock production is linked to the government’s attempts to improve its fiscal health via import substitution. Fulani cattle raising has been a boon to domestic beef production and has, until recently, been a major focus of livestock development policies (see below). The intention here has been to link the policy of promoting Fulani pastoralism to structural features (e.g. balance of payment deficits) of the Ivorian development model. The following sections take this discussion to the local level where I examine the remaining causal agents of Fulani-Senufo conflicts identified in Table 1.

The Study Area

This case study is based on fieldwork undertaken in the Katiali region of northern Ivory Coast during a fifteen-month period in 1981–82 and during the months of June–July 1986. Katiali, the seat of a precolonial chiefdom, is today a village of some 1800 inhabitants located 60 km north of Korhogo (Fig. 1). The sparsely settled region lies within the transition between the guinea and savanna zones. Rainfall varies in the region between 1000–1200 mm a year. The dry season, beginning in early November and lasting until mid-May, is seven months long. Within this transition zone, the most representative plant communities include the savanna woodland, the tree and shrub savannas, grassland and open forests, and gallery forests along river courses (ORSTOM 1979).

The major ethnic group in the region is the Senufo whose major economic activity is farming. The major staples grown are maize, yams, rice and millet. Cotton is the major cash crop and covers approximately 45 percent of the total area under cultivation. The agricultural system integrates shifting cultivation in upland areas (6–10 years of cropping with 10–20 year fallow periods) with lowland swamp rice cultivation. Ox-drawn cultivation is rapidly expanding throughout the area. In 1981–82, 37 percent of the 38 households surveyed in Katiali employed animal traction. By 1986 the number of ox-owning households in the sample increased to 61 percent.

Rainfall, vegetation and human modification of the environment are three crucial variables influencing the distribution and density of tsetse flies (Glossina spp.) in northern Ivory Coast. As the vector of both animal and human trypanosomiasis, the presence of Glossina has historically restricted the range of zebu cattle and human settlements to relatively disease-free areas (Cuisance 1975; Taze 1977). Three Glossina species are present in the Ivorian savanna: G. palpalis gambiensis, G. tachinoides and G. morsitans submorsitans. In the study area, all three flies are essentially riverine species, found in growing concentrations in the upper, middle and lower courses of streams covered by gallery forests. Fly densities vary considerably between the rainy and dry season, with the greatest concentrations occurring during the rainy season along the major rivers. The modification of the natural landscape by farmers and hunters has reduced the habitat and number of hosts for tsetse flies throughout the more populated north-central savanna region. Fulani herds are consequently most often found grazing close to agricultural zones where fly densities are much lower than in uninhabited areas (Cuisance 1975). This dependence on farmers to reduce tsetse habitat constitutes an important human-ecological linkage permitting the Fulani to engage in livestock raising well within the tsetse belt.

Other herd management practices including frequent herd movements, crossbreeding of zebu animals with local trypano-tolerant taurin cattle (e.g. N’Dama and Baulé breeds) and the frequent recourse to trypanocides have also facilitated the adjustment of Fulani herds to the tsetse zone (Bassett 1986). A heavy reliance on trypanocides has led to the development of chemo-resistant forms of T. vivax which is viewed as a serious threat to the future of Fulani livestock raising in the country (Küpper 1986).

Fulani Pastoralism in Ivory Coast

There are two major forms of Fulani pastoralism in Ivory Coast: the cattle-entrustment system and semi-transhumant livestock raising. Cattle-entrusting dates to at least the turn of the century when Gbon Coulibaly, the Chief of the Cebra Senufo of the Korhogo region, employed three Fulani herders to guard his cattle (ANRCI 1QQ 81).
Cattle-Entrusting

This herding system typically involves the employment of a Fulani herder by a group of farmers who together may own between 30–150 head of cattle. Five herds were guarded by migrant Fulani in Katiali in 1982. The salaried herders guarded 578 head of cattle that were owned by 38 different people for an average of 15.2 cattle per owner. In fact, most people owned less than five head and a small number of individuals owned most of the animals. Four people held cattle in more than one herd and five owners of 46 cattle lived in other villages. One salaried herder owned twenty cattle in one of the herds.

The five herds were corralled at the outskirts of the village. Herders lived either in the village or adjacent to corrals where they sometimes cultivated small gardens. Although the type and rate of payment varied between herders and cattle owners, a common arrangement was 50–75 FCFA per animal per month plus the right to sell milk. Some herders also received food from animal owners during the rainy season. The cattle owners of each herd elected a manager to act as a liaison among them, the salaried herder and local extension agents. Herd managers also coordinated activities that included paying herders, purchasing salt and medications, and organizing work parties to repair corral fences and cattle sales. Depending on the
size of the herd and the number of animals owned by the manager, some herd managers received the third calf of one cow belonging to individual animal owners in compensation for their services.

The sedentary nature of this form of livestock raising is revealed in the pattern of herd movements. The grazing patterns of two village herds in Katiali were noted over a twelve-month period. During the rainy season, the herds grazed within a 2 km radius of the village. This radius extended to 5 km during the middle and late dry season when the herds were allowed to wander further from the village. Village herds are not guarded during the long dry season. The herder simply lets the animals loose in the

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**Figure 2.** Migration of Fulani herds from conflict zones, Ivory Coast, March–July 1986.
morning and rounds them up at night to enclose in their corral. During the rainy season and until the harvests are over, the cattle are guarded carefully to avoid crop damage during the day and are corralled at night.

Fulani Semi-Transhumant Livestock Raising

The second and most recent form of Fulani pastoralism in Ivory Coast is semi-transhumant livestock raising. The arrival of significant numbers of Fulani herds began in the early 1970s in the midst of the great Sahelian drought of 1969-74 (Fig. 1). The Fulani migration to Ivory Coast is tied to a more general transformation of agro-pastoral systems in northwestern Burkina Faso during the colonial period (Benoit 1977). The refusal of freed Fulani slaves (rimaibe) to guard cattle, dig wells and cultivate their former masters’ fields led to new systems of livestock production. Fulani herders specifically began to rely more heavily on livestock raising and, thus, to build larger herds. As the number of cattle increased and overstocking became a problem, the largest herds were taken on seasonal transhumance treks to the Black and Sourou rivers. In search of better pasture and water for their herds, some of these Fulani migrated as far south as northern Ivory Coast by the late 1950s. Other factors drawing the Fulani towards Ivory Coast in the 1960s and 1970s were the absence of cattle taxes, higher prices for cattle due to the proximity of Ivorian markets, initially free veterinary care, and low population densities in the savanna region.

This southerly “migratory drift” of Fulani herds and herders represents a new migration pattern for the Fulani. In his classic study of the Wodaabe Fulani of northern Nigeria, Stenning (1959) notes three broad patterns of Fulani herd movements. The first form of movement is a west-east “migratory drift” of herders beginning in the eleventh century in Senegal and ending in the vicinity of Lake Chad in the nineteenth century. A second pattern is characterized by north-south movements of cattle and herders during transhumance treks between dry and rainy season pastures. The third common form of herd movements noted by Stenning is the sudden migratory movement away from conflict areas. The dramatic outmigration of Fulani herds from conflict zones in Ivory Coast (Fig. 2) is similar to the third pattern (“sudden migratory movements”) in Stenning’s typology. The relatively recent southerly migration of Fulani herds to Ivory Coast, Sierra Leone, southern Cameroon and the Central African Republic (Gallais 1972; Boutris 1986; Bassett 1986) are examples of a fourth pattern of Fulani herd movements.

Bernardet (1984) provides the most comprehensive account of semi-transhumant livestock raising in Ivory Coast. The most relevant features of this herding system to this study are herd management strategies, especially herd movement patterns and the employment of salaried herders, the relatively large size of cattle herds, and the interventions of the Ivorian livestock agency (SODEPRA) in the pastoral sector. A discussion of these areas is important to understanding the background to the present conflicts.

Cattle Herds

In comparison to herd sizes in Sudano-Saharan areas of West Africa, the sizes of Fulani herds in Ivory Coast are quite large. Quéant and de Rouville (1969, 178) report that in the Barani region of northwestern Burkina Faso, where many of the Ivorian Fulani originate, the average herd size is thirty animals. Herd sizes of 30-50 head are also common among Fulani groups elsewhere in West Africa (ILCA 1979, 24). According to Bernardet (1984, 141), the average herd size in northern Ivory Coast is 145 head. In the Katiail region in 1985, thirty-six herders “owned” 5004 cattle which amounted to an average-size herd of 140 head.

Considerable differentiation exists among Fulani herders in Ivory Coast. 47 percent of the herders in the Katiail region owned less than 100 head which amounted to 23 percent of the total Fulani herd. In contrast, 14 percent of the Fulani owned more than 200 head, and controlled 38 percent of the cattle in the region. The average herd sizes for these two groups were 69 and 378 head respectively. Between these two extremes was a remarkable middle-sized group of herders who owned between 100-200 head; 39 percent of the herders fell within this size class and they owned 39 percent of the total cattle. The average herd size of this intermediate group was 141 head.
Salaried Herders

A herd management practice distinguishing Fulani pastoralism in Ivory Coast from other areas in West Africa is the widespread practice of hiring cattle-poor migrant Fulani to guard herds. Depending on herd size, hired herders account for 50–90 percent of the pastoral labor force. In the Niellé region to the northeast of Katiali, Bernardet (1984, 98–101) reports that for households owning more than 250 head, just 10 percent of the herders are members of the household. For households owning less than 250 head and who also farm during the rainy season, the number of salaried herders varies between seasons. They are proportionally more numerous during the rainy season when household members are engaged in agriculture and de-ticking animals requires a considerable amount of labor. Thus, for households owning between 100–250 head, hired herders accounted for 57 percent of the pastoral force during the rainy season but just 40 percent during the dry season when household members are relieved of their farming responsibilities and work as herders. For households owning less than 100 cattle, half of the rainy season herders were salaried while during the dry season they represented just one-third of the workforce. In general, large herd owners employ salaried herders more often than small herd owners.

Salaried herders are paid either in cash or in-kind, depending on their stated preference when hired. Some work to build their own herds and receive a two–three-year-old male animal every six months. They also have access to lactating cows and receive clothing, bedding material and occasionally food from their employers. Those working for money earn anywhere between 8000–13,000 FCFA a month plus clothes and milk.

The general scarcity of salaried herders in local labor markets presents herd owners with the difficult situation of hiring strangers to guard their wealth. To prevent animal theft, herd owners commonly ask “old hands” to watch over the recruit to see if he is trustworthy. The herd owner will also visit his cattle more frequently when a new herder is hired to observe his behavior as well as to oversee herd movements. After two or three months, the employer has a better idea of whether or not the new recruit is dependable and may give him some responsibility in selecting grazing and watering areas. If possible, herd owners will hire people from their home regions because they find them to be more respectful and honest (Sangaré 1986). It is not uncommon for herd owners to hire someone whose origins are unknown and who turns out to be unreliable and only interested in earning enough money to move on.

The rapid turnover of salaried herders hinders the establishment of good working relations between workers and their employers. During a twelve-month period in 1981–82 in the Katiali region, the average duration of employment was six months. Anyone who worked for more than a year was considered an “old hand.” Forty-four herders were hired by seven Fulani households in 1981–82; 80 percent of the herders came from Mali with the remainder coming from Burkina Faso.

Working conditions of hired herders are extremely difficult. Mostly young men in their twenties, the herders often work alone, sleep out in the open air and largely subsist on milk. They guard herds on foot, covering a distance of 6–10 km during the rainy season and up to 20 km during the dry season when good pasture and water are difficult to find. Night grazing, common throughout the dry season, requires herders to watch over herds with the aid of flashlights and moonlight. Since nocturnal grazing begins before the long-cycle crops (millet, sorghum, swamp rice, yams and cotton) have matured, herders must be especially vigilant during the months of November and December to prevent animals from entering cropland.

Herd Movements

Fulani herd movements in Ivory Coast are quite different from the predictable seasonal transhumance patterns between rainy and dry season pastures in the Sudano-Sahelian region. Quéant and de Rouville (1969, 197–205) note the extreme regularity of seasonal transhumance in northwestern Burkina Faso. The treks typically involve the largest herds (40–80 head) which move in a series of steps towards the banks of the Black Volta and Souro Rivers during an eight to ten-month period. In contrast, herd movements in northern Ivory Coast occur...
for human-ecological reasons within the rainy season as well as between seasons.

During the early rainy season months of June and July, both the quantity and quality of pasture and water are excellent. Grazing is strictly during the day and the grazing radius from night corrals is relatively short, within the range of 4–5 km. August, September and October comprise the last three months of the rainy season in northern Ivory Coast. It is a period during which night corrals, and thus herds, change locations more frequently. Movements throughout the region occur for a number of reasons. First, beginning in August, grasses increasingly become less palatable due to lignification. Herd owners instruct their herders to take the animals to fallow land where Andropogon gayanus can be grazed. Some herds are also removed from agricultural areas to prevent crop damage during the maize, upland rice and peanut harvests of August and September.

Coinciding with these changes in pastures, a third more generalized transhumance takes place. This time, herds are moved towards plateaus far from major river basins where cattle diseases pose a threat to the herd’s health. According to Lagrué (1977) and Petit (1980), this shift towards higher ground corresponds with parasite cycles in the moist lowlands.

A fourth factor is fire. In October, after the rains have tapered off, hunters, herders and farmers set fire to the savanna, causing Fulani herds to migrate to unburned areas. November and December, the first two months of the dry season, mark the beginning of a long period (November through May) during which the increasingly severe problems of finding good water and pasture result in the frequent displacement of herds. Many herds reenter agricultural areas to graze on the stubble of harvested fields. Others return to burned-over areas where plant regrowth is sufficient for grazing. A number of herds also move to and from former village sites where the fruits and leaves of some domesticated trees provide alternative sources of forage. It is a period when large herds are divided into smaller herds and when the grazing radius from night corrals extends from 4–5 to 7–8 km. Nocturnal grazing also becomes common, as it takes longer for an animal to find sufficient forage during the day. It is also the period of the greatest incidence of crop damage and when the conflicts between peasants and herders are the most intense.

SODEPRA’s Pastoral Development Schemes

The intervention of SODEPRA in the pastoral sector has gone through three phases since its inception in 1975. The first phase (1975–80) concentrated on the development of an extension system, the operation of five border entry posts to control the influx of herds and cattle diseases into the country, and livestock development projects aimed at both sedentary (Operation Taurin) and semi-transhumant livestock production systems (Operation Zebu). In addition to providing basic veterinary services to village herds in the entrustment system, SODEPRA’s Operation Taurin also appealed to individual large herd owners through its Agro-Pastoral Farms project. This involved working with the 10–15 percent of sedentary herd owners who own 50 percent of taurin cattle (Staatz 1980, 26). A major objective has been to encourage the integration of farming and livestock raising through the rotation of range and cropland, the creation of improved pastures and the provision of technical support to participating herd owners.

The major components of Operation Zebu during the first phase were the provision of veterinary services to Fulani herds and the creation of Pastoral Zones in which zebu herds were to graze in uninhabited areas. Dipping tanks, roads, small dams, improved pastures, housing and even mosques were constructed within these zones for the benefit of the Fulani. The major problem with this approach to pastoral development was the isolation of herders from farming communities. The largely unmodified natural landscape was dense with tsetse flies and Fulani women were unable to sell milk due to their isolation. An expensive and futile tsetse fly eradication program was undertaken in the Palé Pastoral Zone. High rates of trypanosomiasis infection quickly convinced Fulani herders that the Palé was a place to avoid.

The failure of the Pastoral Zone approach led to the development of SODEPRA’s “Microzone” program which was based on the concept of “interstitial” Fulani livestock raising. Recognizing that the Fulani were most often found at the outskirts of agricultural areas, SO-
DEPRA developed a network of Pastoral Management Units into which the movement of herds was to be closely regulated. Pastoral infrastructure was developed within each of these management areas. With the technical assistance of SODEPRA, herders within these areas were encouraged to form associations with individual farmers through which they would be given access to a few hundred hectares of land. Ten to twenty hectares of land would be enclosed with barbed-wire fences and put into improved pasture like the nitrogen-fixing Stylosanthes gracilis. Herds were to be kept within these enclosures at night during the high crop damage months of October through December. After two–three years of grazing this land, the Fulani were to return it to Senufo farmers who would cultivate it for a five–six year period. In the meantime, a new section of improved pasture would be prepared by the Fulani herder which would be similarly rotated with crops in two–three years.

The micro-zone concept reflected a major advance in SODEPRA's attempts to sedentarize Fulani livestock raising. In contrast to earlier attempts to segregate the Fulani from agricultural zones, the micro-zone approach sought to integrate peasant and pastoral production systems. A major problem with this approach, however, was the assumption that Fulani herd owners would prepare and maintain the improved pasture after SODEPRA's initial interventions. But the Fulani were not willing to devote their labor and money to such labor-intensive and risky projects. Another problem was the ethno-economic assumption that the Fulani were strictly pastoralists not interested in farming. In fact, as Bernardet (1984, 35-43) has shown, many Fulani in Ivory Coast are best described as agro-pastoralists who commonly cultivate two hectares of food crops. The exclusion of Fulani households from farming the highly fertile enclosures was identified as another reason behind their lack of participation in the micro-zone scheme.

The third phase of SODEPRA's intervention in the pastoral sector begin in 1984 with the advent of the “Fulani-Senufo tandem” program. Building upon insights and mistakes of the micro-zone program, the thrust of the tandem approach is to distribute the enclosed and fertilized land between both Fulani and Senufo households. A contract is agreed upon in which participating farmers maintain the fence and improved pasture while the herder corrals the animals within the enclosure. Sections of the fertilized enclosure are then allotted to herder and farmer alike. The advantages of this arrangement are numerous: (1) the rotation of farming and grazing lands represents an ecologically sound and intensive system of land management; (2) animals have access to highly palatable pasture when it would otherwise be poor; (3) crop damage is avoided when animals are enclosed at night; and (4) Fulani-Senufo relations are improved when both groups benefit from participating in such schemes.

By the summer of 1986, just two years into the "tandem" program, the results were not promising. Participating herders fled areas in which conflicts were most intense. Also more than half of the tandems were between Senufo farmers and non-Fulani, taurin cattle owners. This group of enterprising herders who seek to take advantage of SODEPRA's subsidies and influence in gaining access to grazing land tend to be affluent urban merchants, politicians and civil servants (SODEPRA 1984). In the wake of the 1986 conflicts, the only tandems that have been established were between these absentee herd owners and Senufo farmers (Koné 1987).

Crop Damage

Data on crop damage were collected in katial from a sample of thirty-eight households for 1980, 1981 and 1985. Members of the household were asked if cattle had entered any of their fields within the past year. If damage had occurred, a series of questions was asked concerning the location, crop, time of day, month and extent of damage. In 1980 and 1981, there were 73 cases of crop damage, or nearly one a year for each household in the village. The rate for 1985 was virtually the same with 36 cases reported. Long-cycle crops were damaged more frequently than short cycle-crops. Combining the three years, close to two-thirds of the fields damaged were cotton (34 percent) and swamp rice (30 percent). Another 15 percent of the cases were reported in millet (9 percent) and sorghum (6 percent) fields. The short-cycle crops received 21 percent of the damages with upland rice (10 percent) and maize (10 percent) accounting for the bulk of damage. Crops were damaged by stray animals and entire herds which trampled and ate their way through fields.
The periodization of crop damage reported by 38 households for these three years is shown in Figure 3. November and December are the high crop damage months. Of 109 crop damage cases, 67 percent occurred during these two months. As noted above, it is also during these first two months of the dry season when Fulani herd movements increase due to the declining quality of range resources.

The locations of crop damage sites for 1981 are shown in Figure 4. More than three-quarters of these sites were either adjacent to or within stream courses where both good water and forage could still be found during November and December. Based on an examination of hoof prints, informants declared that zebu cattle were responsible for 82 percent of the crop damage. Taurin cattle were involved in 9 percent of the crop damage while in 9 percent of the cases, informants were not sure what type of animal was involved. Further evidence suggesting that zebu cattle are responsible for most of the crop damage is the time of day when the incidents took place. In 61 percent of the cases, the damage occurred at night; 27 percent took place during the day and 12 percent was unknown. Fulani herds graze at night during this time of the year while village cattle are corralled.

In summary, on the basis of the close correspondence between the periodization of crop damage and the frequency of Fulani herd movements, the geographical distribution of crop damage sites, and the observations made by the owners of damaged fields, Fulani herds appear to be responsible for most of the crop damage in the Katiali region.

**Local Dimensions to the Conflict**

If there is one factor that most explains the hostility of the Senufo towards the Fulani, it is the lack of compensation for crop damage. In more than three-quarters of the crop damage cases in Katiali in 1985, field owners were not reimbursed for crop losses. Peasants did not know who was responsible for the damage in more than a third (37 percent) of the cases. Another 37 percent of the cases were not resolved because the herder refused to pay for the damages or because he fled the region before paying. A small percentage of cases were resolved amicably at the village level (12 percent) or before a crop damage committee at the Subprefecture (Sous-Préfecture) (6 per-
cent). In 1980–81 farmers did not receive any payment in 83 percent of the crop damage cases. In 10 percent of the cases the farmer did not press for payment while just 7 percent involved some compensation.

When one considers the monetary value of crop destruction, the gravity of the situation for some households becomes evident. Data compiled by SODEPRA (1984) on crop damages paid by Fulani herders to peasants show that during the 7-year period 1977–83, the average value of crop losses was $290/hectare in the Korhogo region. For each crop damage incident, the average loss amounted to $130 for the years 1980–82 (the only years for which these data are available). It is difficult to appreciate the meaning of these average losses for individual households without more precise data on the relative value of damages in relationship to household budgets. Notwithstanding these lacunae, I have estimated that the average household net income from cotton amounted to $680 in 1985. That is, the average value of uncompensated crop damage ($130/incident) equals approximately one-fifth of the average cotton-growing household’s annual monetary income! Of course, the magnitude of this lost income can vary widely depending on the socioeconomic status of each household. Nevertheless, this estimate of uncompensated damages hints at the severity of the problem. Household survey data from Katiali indicates that such losses were widespread in 1985 when 43 percent of all households in the village experienced uncompensated crop damage by Fulani cattle. In sum, the principal “counter-risk” to peasant-h育人 tension (compensation) has become a major cause of the conflict because damages are not paid to victims.

Crop damage committees were established in the mid-1970s to hear cases that were not resolved at the village level. Committees are composed of five members: a guard from the Sub-Prefecture, the village secretary of the PDCI (the only political party in Ivory Coast), an agricultural extension agent, a livestock extension agent, and a representative of the local Fulani. Committee members visit the crop damage site in the presence of the farmer and herd owner. The field owner must travel to the Sub-Prefecture to request a hearing and is required to pay for the travel costs of each committee member. Corruption is common in which the herder pays off a member of the committee to influence the outcome of the case. It is widely known that local officials of the PDCI have built sizable herds as a result of their involvement in crop litigation. Even if the farmer wins the case, he may never be remunerated if the herder refuses to pay or flees the region. Field owners are thus forced to return to the Sub-Prefecture to seek enforcement of the committee’s ruling. Even when farmers know who is responsible for crop damage, they are often reluctant to bring the case before the crop damage committee because they know from experience that compensation is unlikely.

This frustration turns to anger when farmers view their loss as the Fulani’s gain. As ox-drawn cultivation has spread throughout the savanna region, farmers know the value of a pair of oxen. When cattle trample through and eat their crops, farmers clearly recognize that herd owners are becoming more wealthy at their expense. The expansion of cotton cultivation and the increasing monetization of the local economy have also heightened farmers’ awareness of the monetary value of their crops. The breakdown of lineage-based units of production to smaller social units organized around the conjugal household has also entailed the loss of buffering mechanisms which might have protected individuals from crop losses in the past. Today a major crop loss could easily lead to indebtedness and the humiliation of household heads who pride themselves on their self-sufficiency (Memel-Fote et al. 1975).

Fulani herd owners cannot alone be held responsible for the current conflicts. They argue that tensions are generated when farmers seeking to cultivate the manure-rich land around former night corrals force them to move their camps. Fulani agro-pastoralists who cultivate food crops in an intensive system involving the rotation of fields with corrals feel particularly angered by these forced removals. Farmers also purportedly encourage crop damage by planting their fields close to Fulani camps. Under the pretext of crop damage, the farmer forces the Fulani to move his camp and then proceeds to extend his fields onto the manured land (Bernardet 1986, 34–35).

The Fulani’s vulnerability to this “appropriation” of manured lands stems from their lack of secure land rights. Normally, anyone seeking land-use rights in Senufo country must gain the authorization of the local earth priest (tarfo)."
In fact most household heads have certain rights to land gained through previous land-use authorizations and commonly extend some of these rights to their kin and even outsiders. When Fulani herders enter a new region, they are obligated to seek permission to establish their camps. A SODEPRA study noted that more than half of the 27 Fulani herders interviewed in the Napié and Dikodougou regions failed to seek authorization to settle in the area (SODEPRA 1984, 29–37). Eleven percent already had relatives residing in the area and did not feel obligated to seek permission from indigenous landholders. The largest percentage (44 percent) claimed to be the guests of the Ivorian government and did not feel compelled to inform village chiefs and earth priests of their arrival. This last group is viewed by the Senufo as “squatters” on their land who would be expelled were it not for official government policy to encourage Fulani livestock raising. Those who did seek authorization (45 percent) only obtained temporary residential and grazing rights because herders are given access to land only under the stipulation that they will move when the landholder wishes to farm in that area. Such tenuous land-use agreements help to explain why even responsible herders are reluctant to commit themselves to SODEPRA’s sedentarization schemes, especially when they entail financial obligations.

The important role now being played by salaried herders in Fulani livestock raising is another significant socioeconomic factor behind the current conflicts. Bernardet (1986) argues that in comparison to the salaried herders employed in the entrustment system, herders hired by Fulani cattle owners are poorly renumerated for their labor. Despite similar monthly salaries, semi-transhumant Fulani herders are poorly fed and are unable to sell milk to supplement their incomes. In 1984 salaried herders waged a strike for higher pay in the Kiemou area. They let their herds stray in the bush until their demands were met by local herd owners (Sow 1986). In the absence of good working conditions and with the highly transient nature of this work, many hired herders, especially those working for a monthly salary, do not devote much care to their work. Moreover, since it is the herd owner who pays for crop damage, salaried herders are not compelled to be more vigilant. It is not uncommon for them to leave their herds unguarded in the bush at night to socialize with friends in the village, oblivious to any crop damage that their animals might be causing.

The issue of village cattle thefts has also contributed to Senufo-Fulani tensions. The Senufo claim that before the arrival of the Fulani and their hired herders, there were no such thefts. It was not uncommon for an animal or two to disappear from the village herd during the dry season when herds graze unguarded in the bush. But the theft of dozens of animals and sometimes entire herds has only happened, informants say, within the past ten years (Traoré 1982).

A heterogenous group of people is believed to be responsible for these thefts, including local young men, cattle merchants, Fulani salaried herders and jobless Sahelian immigrants. It is unfair to blame the Fulani for all of these thefts despite a number of cases in which they have been found selling stolen animals to butchers. Nevertheless, the coincidence of these thefts with the Fulani migration to Ivory Coast and the hostility of the Senufo towards them over the problem of crop damage has resulted in the Fulani being blamed for cattle thefts.

When asked about their feelings toward the Fulani, most members in the sample of 38 households said they wished the Fulani would return to their native countries. A few indicated that they would be more willing to welcome them if there was something to be gained from their presence. With the exception of a few livestock traders and a merchant whose grain, salt and gasoline sales were booming due to Fulani demand, most people said that the losses entailed with crop damage far outweighed any benefits they received. For example, if local diets were improving due to greater beef consumption, then this might offset some of the losses associated with crop damage. Yet a survey of local rates of meat (beef and game) consumption showed that beef was rarely consumed by villagers. Two-thirds of the households “rarely” (0–3 times/month for the household head) ate beef or game, 24 percent consumed it “occasionally” (4–10 times/month) and just 10 percent could “commonly” (10 times/month) afford it. Such low levels of rural beef consumption are corroborated in a national survey for 1985 showing that urban rates of beef consumption were six times higher than that for rural levels (FAO 1986). The fact that
urban residents appear to be the major beneficiaries of the Fulani’s economic activities heightens the Senufo’s awareness that they are the real losers in this development scheme.

Political Responses

Beginning in 1974 the Senufo began to attack Fulani herders in the bush to force them out of the country. A few deaths were reported as were many incidents of cattle slaughters. In response to this unrest the president of the country visited the three northern departments of Bouniala, Korhogo and Ferkessedougou in March 1974. Four months later an inter-ministerial commission was formed to design a livestock development program which was eventually taken over by SODEPRA.

During his trip President Houphouet-Boigny spoke on the government’s open borders’ policy which has historically encouraged foreigners to participate in the national economy. In the spirit of this tradition, the president urged the Senufo to welcome the Fulani into their homeland (Coulibaly 1980). Despite the president’s appeals and the efforts of SODEPRA to establish pastoral zones for the Fulani, candidates running for local and national offices in the 1980 elections sought rural votes by promising to expel the Fulani from the country, if elected. Convinced that these political leaders supported their actions, armed Senufo farmers attacked Fulani herders in late 1980 and early 1981. Camp burnings, animal slaughters and personal assaults were widespread. At least six Fulani were killed and many more wounded. Herd owners fled with their families and animals to conflict free areas, to wait for the tensions to subside. Gendarmes quickly arrested and imprisoned dozens of peasants in areas where attacks had occurred. Shortly thereafter, Houphouet-Boigny convened a meeting of political representatives from the north at his residence in Yamassoukro to censure them for their role in the conflict.

The rebellion of 1986 was in many respects a replay of the 1980–81 unrest. The platforms of some politicians running for office in the 1985 election contained anti-Fulani positions. Unabated and uncompensated crop damage continued to plague Senufo farmers. The murders of three farmers in January, April and May of 1986 attributed to Fulani salaried herders sparked the most intense and bitter conflict to date. Armed attacks in the night left approximately 80 Fulani dead. Hundreds of camps were abandoned and tens of thousands of animals fled to the Ivorian frontier (SODEPRA 1986).

What was different about the 1986 unrest was the extraordinarily slow response of Ivorian authorities to the conflicts. No arrests followed the uprising and it was not until January 1987 that an official delegation met with political representatives of peasants and pastoralists to “bury the war axe” (Fraternité Matin, 16 January 1987). The postponement of the delegation is believed to be related to intrigues and power struggles among northern politicians and government officials over the Presidential succession. This long silence, officially attributed to a delayed ministerial reshuffling, was interpreted by both the Fulani and Senufo as condoning the latter’s actions. By the summer of 1986 SODEPRA’s livestock development program was clearly in jeopardy as village elders met to discuss how to chase the Fulani from their area; a return migration appeared imminent as Fulani herds straddled the Ivorian frontier.

The livestock development policies and projects of SODEPRA have also raised the ire of the Senufo towards the Fulani. The most sensitive issues center on infrastructural investments made for Fulani pastoralists (e.g., enclosed improved pastures, small dams) and the policy of granting land-use rights to the Fulani. Land rights are a highly contentious issue among the Senufo. Earth priests are usually willing to grant temporary usufruct rights to outsiders but generally forbid any land improvements, like planting an orchard, which will make it difficult for them to reclaim the land at a later date. Despite contracts drawn up by SODEPRA which state otherwise, customary land holders fear that they will lose control of the land once the Fulani establish their camps. Dipping tanks, corrals and improved pastures are viewed as permanent improvements. Once they are established, it is difficult to reassert one’s control over that land (Silué 1986).

The above fear is well-founded due to the ambiguities of Ivorian land tenure laws which officially give the state power to distribute “unused” lands. Yet, with less than 1 percent of land formally registered, “customary” land
rights are generally respected and development agencies like SODEPRA work with indigenous land holders to implement their programs. When the local population refuses to cooperate with these agencies, the state asserts its power to regulate land use. Until recently Fulani herd owners have been allowed to settle in non-agricultural areas after gaining the local earth priest’s permission. In the wake of the rebellion of 1986, few indigenous land holders were willing to grant the Fulani access to land for fear of being censured by fellow villagers. Consequently, the state asserted its authority and declared through the intermediaries of Prefects and Sub-Prefects that land must be made available to Fulani pastoralists. During the months of June–July 1986, the subprefect of Niofoun visited Katiali three times to calm the situation and declared that only he had the authority to forbid the Fulani to settle in the Katiali region.

A major problem facing the Fulani is that the land they are being allotted is unsuitable for livestock raising. For example, the Fulani of the Katiali region were granted grazing rights in 1986 to two areas far from agricultural zones. They consider these areas to be unfit for their cattle because of poor pasture and the presence of tsetse flies. As noted above, for human ecological reasons, Fulani herders prefer areas closer to agricultural zones where fly populations have been reduced and fallow land grasses are highly palatable.

Confronted with a large scale outmigration of Fulani herds to neighboring countries and continued peasant resistance to its sedentarization schemes, SODEPRA’s Operation Zebu was in disarray at the end of 1986. After more than a decade of pastoral development projects and extension efforts, its basic goals of reducing peasant-herder conflicts and encouraging Fulani pastoralists to settle in the country were seriously in question. What were originally localized tensions between farmers and herders over the issue of uncompensated crop damage had now become an explosive inter-ethnic conflict. These failures of SODEPRA’s pastoral development schemes have not gone unnoticed by foreign donors and the Ivorian government. The economic crisis has placed severe pressures on the Ivorian budget, forcing the government to cut spending and to curtail unsuccessful programs. SODEPRA’s pastoral development program is now scheduled to be axed in the fall of 1988 (Koné 1988).

Conclusion

This case study seeks to contribute to the growing literature on peasant-herder interactions in sub-Saharan Africa by viewing peasant-herder conflicts as “responses, in context” (Johnston 1986, 64–72). A common theme running through these studies is the prevalence of land-use competition and its adverse impact on pastoralists who nearly everywhere, it seems, are losing land (Burnham 1980). The literature is replete with lists of factors which help to explain pastoral land loss and peasant-herder conflicts. The descriptive dwindling land base model presented in much of this literature does not sufficiently explain why some herders are being “pushed out” of former rangelands while others are officially welcomed into new areas like Ivory Coast. What is needed are more rigorous analyses which link local level production processes and decision making with the larger political economy to explain these different experiences.

The objective of this study has been to delineate the major links in the chain of causality giving rise to Senufo-Fulani conflicts. It is at the intersection of Ivorian political economy and the human ecology of agricultural systems in the savanna region that one can begin to identify the key processes and decision-making conditions behind the current conflict. I have argued that Senufo resistance to Ivorian livestock development policies, and Fulani pastoralists in particular, is linked to the deterioration in their marginal standard of living associated with uncompensated crop damage. This study has highlighted the dynamics of this impoverization by examining, at the point of production, the appropriation of “surpluses” through such diverse mechanisms as the vertical concentration of cotton growers and crop destruction by Fulani herds. This detailed attention to the interrelationships between the political-economic and human ecological dimensions of production processes distinguishes the political ecology approach from human ecology.

The complexity of peasant-herder tensions in Ivory Coast and other regions of West and East Africa suggests that such conflicts are largely
conjunctural and thus difficult to theorize. This study suggests however, that these conflicts contain structural features related to the larger political economy which can be theorized without reducing the complexity of the situation in a crude, deterministic way. The challenge which students of human-environmental relations continue to face is how to analyze the interrelationships between local-level field studies and macro-level processes (O'Riordan 1988). Political ecology is a model that specifically focuses on the linkages between society, political economy and the environment. It is already beginning to offer us theoretical insights into traditional concerns of human geography (Blakie and Brookfield 1987) and holds the potential for yielding further insights into human-environmental relations.

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Notes

1. For political reasons the Ivorian government claimed the number of deaths to be at no more than twenty; however, livestock development officials thought that the death toll was closer to eighty (Escafré 1986).
2. Zebu cattle refer to the large, humped-back animals (Bos indicus) commonly raised by the Fulani in the Sudano-Sahelian region of West Africa. Taurin cattle (Bos taurus) are the dwarf, trypanosomiasis-resistant animals raised by different peoples within the more humid savanna and forest regions.
3. See for example, Hjort (1982), Bennett (1984), Blakie and Brookfield (1986), and Schmink and Woods (1987). Although specific reference to "political ecology" is scanty in the literature, human ecologists have encouraged approaches which consider political and economic processes in the study of human-environmental relationships (Bennett 1976, 7; Blakie 1985; Ellen 1982, 83; Watts 1983). As Watts's 1987 study of famine in northern Nigeria illustrates, one needs to examine the "interactive effects" between society, political economy and dryland ecology to understand the periodic collapse of rural production and distribution systems in the Sahel. Blakie (1985) and Redclift (1984) similarly argue, in examining the processes of environmental degradation, that one must consider the social relations of production and exchange to understand land use decisions and the rationale of maladaptive behavior. What distinguishes this recent work from previous approaches to human-environmental relationships in the Third World is the rigorous attention given to production processes at various scales of analysis. De Souza and Porter (1974) noted close to fifteen years ago that this was an area in which geographers could make a significant contribution to Third World development studies.
4. In contrast to the strengths of this conceptual framework, Torry's argument on the analytical weaknesses of so-called "dependency" approaches to famine is controversial (Torry 1986). For a critique of this latter work, see Watts, "Faces of Famine: A Response to Torry," Geoforum forthcoming, 1988.
5. CIDT (la Compagnie Ivoirienne du développement des textiles) is a joint venture between the Ivorian state (75 percent) and the former French cotton company CFDT (25 percent). It was created in 1973 when the Ivorian government became a majority shareholder (55 percent) and changed its name from CFDT. For a closer look at the financial inner workings of this parastatal, see Campbell (1984).
7. As is well known in Fulani pastoralism, there are often many proprietors of animals in the family herd. Thus, when speaking of the "herdowner" one is usually referring to the oldest and most competent male of the household who manages the herd for the entire family.
8. In Nigeria, Cameroon and Niger, herding is most often undertaken by young boys and adolescents of the household (ILCA 1979, 23). Although hiring herdsmen is not unknown in northwestern Burkina Faso, according to Queant and de Rouville (1969, 187), it is rare outside the Barani region.
9. SODEPRA subsidizes (50 percent) the cost of the barbed wire fence used to enclose improved pastures. It also constructs dams and dipping tanks and trains extension agents to help herdsmen improve animal productivity.
10. It is estimated that more than 90 percent of rural household monetary incomes in the Korhogo region derive from cotton earnings. According to CIDT (1986), cotton growers in the northern savanna region planted 1.7 hectares of cotton and had an average yield of 1,259 kilograms/hectare in 1985. Subtracting input costs, net incomes at 115 FCFA/kg from a hectare of cotton amounted to $400 using an exchange rate conversion of 250 FCFA/U.S.$.
11. Land is not privately owned outside of urban areas in northern Ivory Coast. The tartolo is the oldest living male member of the founding matrilineage
who regulates land rights within the indigenous land tenure system.

12. They are prevented from selling milk for two reasons. First, if herders went into a neighboring village to sell milk, the herd would be left unguarded. Second, salaried herders are usually bachelors or without their wives, and it is women who customarily sell milk.

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