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of the Kordofan Region, Western Sudan”

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THE TRANSHUMANT PRODUCTION SYSTEM AND CHANGE AMONG HAWAZMA

NOMADS OF THE KORDOFAN REGION, WESTERN SUDAN

by Joel M. Teitelbaum¹

I. Introduction

Social-cultural factors are critical to an interdisciplinary understanding of the transhumant nomadic system of production in central Kordofan, Western Sudan. This can be seen in the adaptation and socio-economic characteristics of the Hawazma tribe which migrates from South Kordofan's Nuba Mountain area to North Kordofan in a transhumant cycle.²

For the purposes of this study the Transhumant Production System defines a group of households living in tent-camps (fariqs) with its livestock and trekking from the clay plains of the Nuba Mountains in the rainy season to the stabilized sands (qoz) of North Kordofan. Transhumant households go in search of sandy (qoz) soils and markets in the north and to avoid mud, flies and diseases in the southern cracking clays. They cultivate foodcrops along their migration route during the rainy season, returning south after the rains to harvest their fields. They then disperse to base-camps on the cracking clay plains near permanent sources of water for the long dry season. Transhumant households spend most of the year in this dry season location. Household heads often maintain another home in a sedentary community of the Nuba Mountains. The main tribe of transhumants in the study area are the Hawazma, a Baqqara Arabic-speaking Muslim people.

II. The Ethnographic Context of Hawazma Nomadism

The Hawazma are one of the well-known Baqqara (i.e. cattle-rearing) tribes of Western Sudan.³ Actually a «super-tribe», the Hawazma are a federation of major tribal sections who claim descent from a common ancestor. There are two sub-tribes, the Hawazma proper and the Halafa. The latter are located in the eastern districts of Kordofan. The major tribal sections of the Hawazma occupy the Central Districts of South Kordofan during the dry season and early rains. In the rainy season (from July through September) they move with their livestock to the south of El-Obeid, the major administrative city in North Kordofan.⁴ These traditional nomads travel in camping groups composed of several patrilineally related households called fariqs. A fariq group is based on the minor lineage, the male descendants of a deceased man up to five generations in genealogical depth, called «iyal rajil» (sons of a man). Larger groups of agnates form major lineages or tribal sections, termed khashem beit or dar. (See Cunnison, 1966).

There are five major migration routes between South and North Kordofan used by tribal sections of the Hawazma. From west to east they are as follows:

1. The Western Route, passing through Kadugli via Dilling to Abu-Haraz with many sub-routes.
2. The Central Route, passing from Talodi through the Habila mechanized scheme to Kasgeil. There are three main sub-routes, Hamra-Um Dorein-

Talodi; El Ware1-Um Heitan-Talodi; El Hadia-Fiyu-Habila-Talodi.

3. The Eastern Route, the Kalogi Route.
4. The Liri-Benjeded-Delaby Regeba Route.
5. The L'Araish Regeba Route. (The Regeba routes in the east pass along shallow river valleys, regebas).

Several Hawazma tribal sections use one or more of the first three routes in the Central Districts of Kordofan, with a well-defined orbit for each. Camping groups or entire minimal lineages may change routes from time to time due to extenuating circumstances of an environmental or conflict nature. The route studied most closely for this paper is the Western Route through Kadugli.

The Kadugli-Dilling-Abu Haraz migration route is a major livestock trail which draws many transhumant camps from the Southern Jebels (mountains) of South Kordofan⁵ as well as camps located between Kadugli and Dilling in the Northern Jebels. Most nomadic households and their herds pass through Kadugli town which has mountains on both sides. Then the caravans follow the paved road north over hilly terrain to Dilling town. They continue along the paved road to Debeibat at the railway line where the road ends. From there the trail cuts across sandy plains northward to an area of market towns south of El-Obeid, the regional market and administrative center.

The main tribal sections using this route among the Hawazma are: Dar Jawad (sub-sections Dar Sholongo, Dar Nya'la, Dar Ba'ati and Dar Bkhota); Dar Jamaiya; Dar Jaamil; sub-sections of Dar Rawawga.

The Western Route makes use of the paved road over several mountain ranges which has good access to market towns and villages as well as motorized transport along the way. There are also man-made water points (hafirs) distributed along this route, and relatively large areas for grazing. The Western Route avoids most areas of cracking clay plains where mechanized cultivation impinges on the nomadic areas. It is used heavily by traditional Hawazma camping groups. In recent years other nomadic peoples searching for ample grazing and water resources on their trek have adopted this route. They include many camel nomads from North Kordofan, Messiriya Humr and recently «nomadizing» Nuba tribal herders from the Nuba Mountains. Fellata (Fulani) cattle nomads also use this route.

Agro-Pastoral Linkages between Transhumant and Sedentary Hawazma

Hawazma transhumant nomad camps spend long periods of time in the Nuba Mountains area of South Kordofan, usually from November through June each year. (WSARP, 1982; Hunting, 1981). The nomads cultivate plots in the cracking clay plains of the Nuba Mountains and enjoy strong ties to permanently settled Hawazma in this region. Over half the Hawazma are no longer nomadic, having settled during the twentieth century as village farmers, traders, and government workers in towns.

The tribal sub-section Dar Sholongo, whose membership is dispersed along the Western Migration Route between Kadugli and Debeibat during the dry season, is more or less split between nomads and sedentaries: of 24

lineage clusters recorded, 11 engage in regular transhumance while 13 are settled farmers and townsmen. Eight of eleven transhumant groups contain at least one sedentary household unit which cultivates while the majority of their close kinsmen move north with livestock into North Kordofan during the rainy season. Only three fariq groups are completely pastoral, i.e. do not engage in cultivation. The thirteen fully settled clusters send their livestock north with members of other groups to whom they are closely linked. Sometimes, settled individuals or households join transhumant camps and become nomadic, while other nomads drop out of the transhumant stream and sedentarize (Teitelbaum, 1982).

On average, the largest herds of cattle are owned by the fully transhumant nomads and the smallest size herds belong to fully settled townsmen in this tribal section. The majority of middle-sized herds (about 100 head of cattle) belong to transhumants who also cultivate. Small herds of less than twenty cows are owned mainly by sedentary farmers. Some settled households own no cows at all, but raise sheep and goats, and are given milk cows by transhumant kinsmen.

Sedentary relatives of transhumant households assist in cultivation by managing the crops of absent households while the nomads are away in North Kordofan. When elderly or disabled nomads settle they often go to live with sedentary kinfolk. Transhumant and sedentary relatives lead very different day to day lives. However, reciprocal relations enhanced by intermarriage and inheritance permit circulation of individuals and cattle between the two systems. Members of both systems benefit in terms of improved living standards, education, exchange of labor and security by taking advantage of their mutual kinship and marriage ties.

Transhumant Units of Production and Consumption

Transhumant Hawazma social and economic organization takes the form of production and consumption units which overlap, but which are not always coterminous. The minimal unit of consumption is the nuclear family household, i.e. the residents of one tent (beṭ). This elementary household consists of a mother and her immature children, or a sister providing housekeeping for her unmarried siblings. It is attached to a husband or adult brother or married son who is the «provider» for the unit. The provider supplies food and acts as the main purseholder for household cash purchases. The role of provider for more than one tent unit is vested in an adult man. Within this framework, each woman manages her own minimal household unit of consumption.

The basic production unit is the expanded family or compound household supervised by the adult male. It is composed of female-managed consumption sub-units. The male provider manages the combined herds of his compound household, and cultivates rain-fed crops with the assistance of his women and their children. The expanded family also has a consumption role; as foodgrains are supplied to all members by the provider, meals are served to him by each tent and child-care and other domestic functions are often shared among the women. Hence, the minimal and compound households are overlapping consumption units, combined for production.

Production and consumption also take place at the camp-wide level. The fariq is a group of several compound households that operates as a

mutual assistance organization. Members of different households assist one another in livestock management tasks, food distribution, security maintenance and moral support. Owners of separate herds spread the costs of livestock production -- especially peak labor demands, vaccination, and payment of blood-debts -- across several household groups within the camp of fifty to one hundred persons. They also engage in economies of consumption such as sharing hospitality for guests, and providing meat from slaughtered animals for all members of the fariq. Much value is placed on closely related households transhuming together, and helping one another along the trail. If a man is absent or ill other men attend to his herd management and grazing. Any man present acts as guardian for the women and children of his neighbors. Fariq members are obliged to protect one another in case of danger and assist one another in adversity. They celebrate important life events such as weddings, funerals and circumcisions together. Their reciprocity is an essential cultural element in the seasonal organization of transhumance.

The ties of solidarity which bind fariq households together are usually based on close patrilineal and cognatic kinship ties. Marriages between households perpetuate these ties over generations. Arrays of brothers or first patrilineal parallel cousins make up the structural framework of a camp. As the membership grows and the herds increase there is a tendency toward fission into smaller camps (of less than ten married men). The group splits along the lines of patrilineal kinship, with a new fariq composed of a father and his married sons or a group of siblings and their father's brother.

The Fariq

A fariq is not a spatially random grouping of tents. Its arrangement reflects Hawazma values and social organization. The general shape of a fariq is circular, an egalitarian arrangement of tents around a central point. The door of each tent faces inwards toward the focal point, known as the navel (surra) where men usually gather around their shade-trees (shajara). The circularity and central focus symbolize the solidarity of the group whose members are tied to one another by multiplex links of descent, kinship and marriage. A fariq may include «outsiders» who become attached to it through friendship. Their tent is incorporated into the circle, hence into the social order.

Within the outer housing arc allocated to a compound household the tents of the male provider are arranged with his last-married wife on the far left. Other female dependents usually have their tents on his right. Inside the ring of tents are small animal corrals (zaribas) constructed of thornbush by each compound household. The innermost circle is that of the men's angaraibs (rope-weave wooden framed beds) under the central tree, sometimes with a rakuba (shelter).

Women carry out most of their activities around the courtyards of hardpacked earth in front of their tents and straw kitchens. Outside the ring of tents a temporary oval wedding house is placed behind the tent of the bride's mother for marriage ceremonies. A special large rakuba (shelter of sticks and thatch) is built for mourning by the men beyond the ring of tents. Made of sticks and grass⁶ these housing units are transient and portable, but their layout is stable.

Cattle and Marriage Values

Household members in a transhumant camp live within yards of their main capital assets and source of livelihood, cattle and small ruminant herds. Cows, sheep and goats wander into the tents at times. A close symbiotic relationship exists between domesticated ruminants and their human managers which is simultaneously biological, economic and cultural. Traditionally, oxen are used as riding and baggage animals on the trek or to market but at present camels and donkeys have come into widespread use.

A culturally defined kinship idiom is used as the basis of group identity among Hawazma. It is built on Islamic marriage rules and concerns their valued livestock, especially cattle. Individuals are expected to marry within their larger family group. Islamic incest regulations that prevent sexual congress closer than a first cousin are observed. No siblings or immediate aunts, uncles, nephews or nieces may marry. A man may not marry his father's former wife. There is a distinct preference for close cousin marriage, and an avoidance of marriage outside the tribal section. Most marriages take place within the wider family grouping among first, second or third cousins. A man may marry up to four wives, but most take two or three.

Marriage to a female cousin is preferred for a variety of reasons in addition to inheritance of herd animals and land. It is thought good that spouses come from a shared childhood; this is supposed to make the marriage endure. Marriage within the camp group forms alliances between component households which increases their solidarity and common interest in offspring. Close cousin marriage is intended to prevent divorce through parental and sibling pressure for reconciliation in case of discord between spouses. Should a woman be widowed young she is often taken in marriage by her deceased husband's close kinsman in the fariq. If divorced while young a woman can marry out of the group as her choice of husband is no longer controlled as completely as a first marriage by her father or guardian.

The importance of preferred close-cousin marriage to Hawazma transhumants is underlined by another Islamic marital restriction. Children wet-nursed by the same woman may not marry even if they are related as cousins or unrelated. Traditionally, a lactating woman breast-feeds the child of a deceased mother or of a woman who is unable to produce milk. However, the anticipated marital arrangements between children within a fariq or the minor lineage have led to the substitution of wet-nursing with feeding of goat-milk to these infants to retain the option of a variety of close cousin marriages over time. Animal milks are highly preferred foods among these transhumants. Cow milk is believed to strengthen the blood and promote growth and health. It is a «superfood».

Livestock Transfer and Breeding

Persons outside a transhumant household receive livestock mainly by means of inheritance, gift or blood-debt payment. Blood-debts represent compensation between lineage groups for death or injury caused to one of their members. This tribal institution is based on customary codes that compensate human loss with cattle of specific age and sex, the number fixed according to the degree of injury (Teitelbaum 1983). Within a transhumant group most inheritance of livestock, especially cattle, passes from parents to children. Lineage cropland also comes from their parents.

According to Islamic Law which Hawazma claim to follow, a parent's patrimony is divided at death among the offspring in a ratio of two parts for each son to one part per daughter. The surviving spouse also inherits a share. In this way cattle might be passed to heirs outside the fariq, and the herd dispersed. However, by Hawazma custom nomad women «voluntarily» return their cattle shares to their male siblings in the fariq. This effectively prevents a splitting up of the parental herd. Immature sons' herd shares are held in trust by an older married brother or paternal uncle (or even by a widowed mother and her male guardian) until they marry. Hence most herds are not quickly divided at the death of their owner (Cunnison, 1966).

Inheritance of cattle is intimately linked to the traditional forms of close cousin marriage and the special status of women in a transhumant camp. When marriages take place between households in a fariq, this assures stability and continuity of total herd composition in the camp. Few reproductive cows are transferred to outsiders. When sedentary heritors receive cattle from a fariq they traditionally «loan» their livestock back to the transhumant heritors to be trekked north during the rainy season. The cow and its offspring remain the property of the sedentary owner, but the transhumant household has rights to the milk. Similarly, fariq dwellers «entrust» (amana) milk cows to their poorer, usually sedentary, relatives; it is a cultural imperative among Hawazma that their children drink milk regularly. The cow is returned to the transhumant herd when dry, and replaced by a fresh cow.

These devices serve to maintain a breeding herd within a compound household and for the fariq group. Most cows come into estrus during and just after the rainy season. They are often serviced by bulls from the Hawazma trekking herd. Inbreeding of cattle is frequent in a transhumant herd. The best milk cows and their calves are retained for milking and breeding purposes. Market sales are mainly of male castrates, and sterile or sick cows.

Although this network of cattle retention serves to prevent key reproductive animals from leaving the herd, the effect of inbreeding tends to lower the productive capacity of the animal unit. This suggests that use of adapted stud bulls would successfully raise hybrid vigor, and hence productivity of cows in a transhumant herd.

Sedentarization and Nomadization

Transhumants in South Kordofan include at least three main types of pastoralists: 1) mainstream transhumant households, 2) sedentarizing households, 3) nomadizing households. Each of these categories can be seen as «recommendation domains» for technical interventions to improve production:⁸

1) The mainstream transhumant household lives in a camping group of several similar households that makes a steady north-south orbit of migration each year. Mainstream households keep stable numbers or have growing herds of one hundred or more cattle and about half as many small ruminants. Cropping is a secondary activity, used for partial fulfillment of food needs. Few mainstream nomads plant labor-demanding cash crops like cotton. They may hire laborers to weed their crops and sedentary kinsmen may help with crops during the rainy season. The economic mainstay of the compound household consists of livestock sales, and the women of minimal household units sell milk products from the herd.

The household heads are market-oriented and responsive to short-term gains in production which they see as raising their wealth in livestock and their cash income for consumption and reinvestment in herds. They may change encampments several times a year in response to vagaries of rainfall, grazing or need to escape outbreaks of cattle disease. They normally spend the longest period of two or more months in North Kordofan and take longer on the transhumant trek than do sedentarizing households. Household heads marry two or three wives.

2) The second homogeneous grouping is the sedentarizing household. Migratory movements of households within a fariq are less consistent to the north from year to year. The household may change its trek route to accommodate other factors such as demographic change and labor needs. Households of this type may have fewer head of cattle. Some years the household head remains behind to cultivate and sends only part of his production unit on the trek north. This type of producer is interested in raising production of foodcrops to feed his household members, and may raise a cash crop for sale, such as cotton or sesame.

The household head is usually an older man with at most two wives. One of his wives lives in a sedentary community year-round while the other goes on transhumance. The sedentary unit raises a house garden (jubra) and works on the cultivations of graincrops in South Kordofan. The transhuming portion of the household spends more time in its base-camp during the dry season than do mainstream transhumants and is less mobile in response to ecological conditions. While market-oriented, livestock do not represent as important an economic strategy for a sedentarizing household, while crops form a more significant part of total income and subsistence. A sedentarizing household head may be involved in a commercial enterprise such as a shop or other stationary facility.

3) The third type is the «nomadizing» or semi-nomadic household. Men and boys, formerly settled farmers, trek livestock north during the rainy season. Having accumulated about 30 head of cattle, they try to increase their herd. Nomadizers are usually younger men, often recently married with minimal numbers of dependents. One wife is common. Women usually remain in the South Kordofan village house during the rainy season to work on cultivations including graincrops on cracking clays, cashcrops such as cotton or peanuts, and the housegarden (jubra) for subsistence. They are assisted in this work by communal labor parties at peak periods such as weeding, when village farmers assist one another.

As household heads become more nomadic, the wife may join her husband on migration and the household becomes a member of a fariq. Some Nuba tribal groups, traditionally sedentary, such as the Moro of the Southern Jebels, have adopted transhumance increasingly in recent years. Although not originally Islamic, the transhumant tribesmen adopt transhumant values including fariq organization and Islamic religious practices. Until they become fully transhumant, nomadizing households are more subject to losses of livestock due to lack of knowledge about ecological conditions and herd management. They are less attuned to the market system than are transhumant Hawzma. They add, as we shall see, to the burden of overgrazing by livestock in North Kordofan during the rainy season.

III. Constraints on Production and the Impact of Change on the Environment

Under current land-use conditions, Hawazma nomads do not control the natural resource base of rangeland and water upon which their mode of production and consumption depends. They must vie with competing users including sedentary farmers on drylands, irrigation horticulturists around water sources, and mechanized farming schemes on large expanses of former grazing lands. There are three main locations where constraints on production are most pressing (c.p. Lebon, 1965; Abdallah, 1982). For livestock rearing, there is the dry season pole in South Kordofan where poor quality forage is aggravated by limited availability of grazing due to inadequate water distribution, competition for grazing, and forage losses from widespread burning. The wet season pole in North Kordofan, in addition to being overgrazed⁹, is time-limiting for both forage and surface (drinking) water. The trek itself is a third source of production constraints with animal losses during the movement along defined corridors between south and north.¹⁰

During the early part of the dry season (November-December) transhumants are faced with fines by local cultivators for trespass of livestock and damage to crops not yet harvested. In addition to paying (sometimes excessive) fines, transhumants must spend management effort to locate their seized cattle at government corrals where they lack access to forage, and in trailing the animals back to their camps. Causes of increased trespassing in recent years including the growing size and dispersion of mechanized farming schemes across traditional grazing areas and the extension of traditional hoe-cultivation by settled farmers with consequent shrinking of grazing areas north and south.

After the harvests, from January to March -- the cool, dry season -- transhumants have a tradition of grazing livestock on the standing crop residues of sorghum stalks and cowpeas. Some settled farmers and mechanized scheme operators now seek fines or payment for use of crop residues. These fodder resources may also be burned to deter entrance of transhumant livestock. Fariqs may locate near towns or villages during the dry season to send their children to schools and to sell milk products and have access to markets. Sometimes they find watering points, especially hafirs (impoundments) closed off to their livestock. Also, some well fields have been surrounded by horticultural plantations, denying the transhumants access.

Range burning in South Kordofan begins early in the dry season and continues until the combustible material has been depleted by the combined effect of grazing and fire. Fires are set deliberately for a variety of reasons or occur accidentally and burn uncontrolled (Bunderson, see note 10). The widespread practice of burning contributes significantly to environmental degradation as a result of 1) changes in botanical composition from desirable forage plants to undesirable fire-tolerant species, 2) reduced rangeland productivity and livestock carrying capacity, and 3) removal of plant cover resulting in increased erosion. The loss of dry season forage by burning over wide areas also makes grazing scarce. This increases livestock energy expenditures in search of food and lowers their nutritional status and productivity. Furthermore, removal of transhumant livestock from South Kordofan during the rains and lack of forage conservation prevent efficient utilization of range resources at their most productive and nutritious stage, i.e. before the dry season sets in.

In North Kordofan, forages of good quality and high nutrient content are much sought after by transhumant herders during the rainy season. However, the expansion of rain-fed cultivation by settled farmers in the north has decreased the area available for grazing. Increased pressure on the remaining rangeland is exacerbated by the enlarging herds of transhumants joined by nomadizing herds of former sedentary farmers. The result is a steady deterioration of the range, evidenced by reduced plant cover and productivity, invasion of unpalatable species, and severe wind and gully erosion. Ultimately, the loss of soil and decline in productive vegetation may lead to irreversible desertification in this semi-arid fragile environment (Bunderson, 1981). 11

Along the migration routes the extension of cultivation has limited the grazing zone for transhumants and increased the number of trespass conflicts with settled farmers. Mechanized schemes have been installed right across nomadic migration corridors causing more conflicts and complicated route diversions. In areas of traditional transhumant camping where the soil has been fertilized by animal manures, cultivators have moved in to exploit the increased potential for crop yields. This too, has adversely affected the forage quality along migration routes and caused trekking problems. Transhumants have also been barred from water points along some routes.

Researchers and policy makers in the Kordofan Regional government have raised questions about the effectiveness of the current administrative system in providing access to resources for nomadic populations and in preserving the range environment. After a recent tour of Hawazma migration routes to determine the causes of problems raised publicly in the Regional legislature, Dr. Suleiman Abdallah, Director of Natural Resources in the Kordofan Ministry of Agriculture wrote in a report:

Transhumant nomads formerly fell within the Native Administrative System and were regulated through their tribal leadership, the Nazir/Omda/Sheikh structures, with jurisdiction over large territorial zones. The leaders understood the needs of nomads and sedentaries and kept them apart. The new system (local government councils and a centralized administration) does not assign nomads to any local areas as they cross administrative boundaries. The system does not lend itself to resolving the conflicts of these mobile people with their livestock.

Land use under the former Native Administration was subject to tribal custom, but the new system now favors sedentaries through the law. For example, gifar (communal grazing reserves) are now open for any kind of investor to cultivate and no agency controls the use of former gifar land. Elimination of the Native Administration was so complete that it cancelled tribal boundaries, took away customary rules and broke down barriers between different populations, causing rangeland havoc. It assisted selfish interests of individuals who took advantage of others in their group. There is an administrative gap here..... Since people are no longer obliged to follow customary law, conflicts between them become more acute..... There is no general policy to guide land use, no common law, and only random unplanned expansion of agriculture goes on (Abdallah, 1982).

Another report by the Office of Nomadic Affairs in the Kordofan Regional Government suggests that in addition to environmental losses, the transhumant production system itself has disintegrated in recent years (Jamma'a, 1982) as inter-tribal relations have weakened and tribal conflicts over land use, water access and livestock have risen exponentially since 1970. Security and public order have deteriorated on the range, with more inter-personal crimes among pastoral nomads. The existing judicial institutions have not contained these quarrels within narrow lineage limits, resulting in feud and tribal warfare. ¹²

IV. Conclusion

The Transhumant Production System among the Hawazma of central Kordofan can be seen to be an effective means of livestock raising through nomadic grazing. Traditionally constituted tribal camping units exploit natural resources across two major ecological zones by season. At the macro-scale the migration orbits constitute the major features of this system linked to tribal sections. Micro-social structures occur as units of production and consumption, including the fariq camping group, the compound household (expanded family) led by a man, and the minimal household 'tent' group managed by a woman. The culturally valued circular layout of tents in a fariq indicates the essentially cooperative and egalitarian nature of this highly mobile and adaptable mode of livestock and crop production. Hawazma transhumant nomads do not have control over their natural resource base of land, grazing and water. They filter in between cultivations in their seasonal migrations and livestock management practices. Cropping is a relatively secondary pursuit.

Hawazma nomadic values are expressed through their material culture and in terms of folk beliefs about cattle and people melded with an Islamic religious ideology. The system of marriage and kinship holds together the camping groups which are structured as parts of minimal lineage descent groups, patrilineal and male-dominated. Through compromises with the Islamic inheritance code, the redistribution of livestock (especially cattle) over generations follows a pattern that maintains a breeding and milking herd in the compound household unit and the fariq as a whole. There may be room for intervention through introduction of hybrid vigor in the cattle herds to increase their productivity. Marketing of livestock is the main source of cash income to men, and milk products provide women with income from the herd. Food security is partially achieved through subsistence hoe-cultivation of crops.

To the naive eye transhumants appear to live a totally nomadic existence with very few material possessions. But in reality they are firmly attached to sedentary communities and kinfolk in villages and towns of South Kordofan where they have dry season base-camps. Hawazma store their heavier, more breakable belongings with relatives when migrating to and from North Kordofan. Their networks of multiplex linkages spun through close-cousin marriages and kinship make for reciprocity between transhumant and sedentary members of large family associations (usura). The customary exchanges of livestock and labor between these two systems mutually enhance their standards of living.

Over time, two processes occur that change the transhumant system while giving it continuity. One is sedentarization, the settling out of

nomads into farming and town communities. Spontaneous settlement has led to the majority of Hawazma becoming sedentary during the twentieth century. However, a reverse trend has been noted more recently, the «nomadization» of settled households. This includes renomadization of sedentarized Hawazma, the adoption of transhumant ways by non-Hawazma groups. In the Nuba Mountains, members of certain Nuba tribes have left their villages to join fariqs, imitating the Hawazma style of life, even through conversion to Islamic practices associated with transhumance.

The transhumant production system in this region can be divided into three types of households: mainstream transhumants who perpetuate the system and possess most of the migratory livestock; sedentarizing households which are gradually settling down in South Kordofan and have fewer livestock; «nomadizing» groups which perceive the advantages of the transhumant mode of production and its economic benefits.

However, there are also increasing disadvantages to unmanaged nomadism:

- 1) There has been serious overgrazing of the vegetation in the goz areas (sandy soils) of North Kordofan where irreversible environmental losses through desertification may occur, aggravated by expanding cultivation by sedentary farmers.
- 2) Abundant forages in the cracking clays of South Kordofan go underutilized by Hawazma transhumants during the rainy season.
- 3) Range resource deterioration and forage loss occur in both North, and (particularly) South Kordofan, resulting partly from extensive and frequent burning of vegetation in the dry season. Also, mechanized scheme developments mine the soil and destroy trees, while preventing livestock access to crop residues. Tree-cutting for fuel needs also removes nutritious browse and certain soil-enriching leguminous woody plants as well as increasing erosion.
- 4) Restrictions on access to permanent water sources for livestock occur near towns and mechanized schemes, and where irrigated horticulture is practiced around well-fields. In short, the natural resource base is decreasing while users increase.

This uncontrolled competition for the resource base leads to conflicts between members of the transhumant and sedentary production systems as well as within the tribal groupings of the transhumants. Because transhumants lack control over grazing and water, especially in the long dry season, transhumant livestock become seriously malnourished and suffer permanent productivity losses. The traditional system of extensive range production and the household camping way of life are in danger of elimination as the environment becomes depleted or alienated.

The Western Sudan Agricultural Research Project (WSARP) is using a Production (Farming) Systems approach to study the transhumants and their interactions with other farmers and with the natural resource base. Technical interventions to improve transhumant household and group production in the short-term have been initiated. In order to maintain sustained yield of livestock products in the longer term, WSARP research also focuses on the policy areas through which government can improve management of land and water resources and protect the environment. Through gradual modification of their production system, Hawazma and other nomadic groups can increase their level of integration with the larger sedentary farming system to the benefit of both groups in Kordofan. Policy changes in administration and justice may also serve to mitigate conflicts between user populations on the range and farms. The goal is to increase food security and stability of production

as well as to promote more offtake or yield from improved livestock and crops by traditional producers, consistent with preservation of the landbase.

FOOTNOTES

1. While carrying out this research (1982-83), the author was Professor of Anthropology at Washington State University, Pullman, Washington, U.S.A., assigned to the Western Sudan Agricultural Research Project as a senior Social Scientist. He is currently Senior Advisor, Food and Nutrition Program, U.S. Department of Agriculture.

2. The etymology of transhumance, from the Latin, means to move across soil types. This fits the alternating seasonal migration pattern shown above. In this study a transhumant nomadic system is one in which complete households move with livestock by season from one ecological zone to another along a regular route or orbit. Transhumant households also engage in cultivation in most years. (See Demiruren, FAO, 1974).

3. Major Baqqara tribes in Western Sudan include the Rizeigat and Habbaniya to the far West. In Kordofan, the Messiriya Humr and the Messiriya Zuruq are in the Western District. The Hawazma occupy the Central Districts, and the Auled Himeid are in eastern Kordofan. (See Lebon, 1965).

4. There is strong historical and ecological evidence that Hawazma Baqqara transhumant groups once occupied territories in North Kordofan beyond El-Obeid. However, with increasing desertification and expansion of cultivation during the colonial period, they have experienced migratory drift into higher rainfall areas of South Kordofan and re-oriented their transhumant patterns. (M.O. Sammani, Personal Communication).

5. The southern branches of this route lead in from Lake Abyed, Talodi and Liri to the southeast. There is a branch from Lake Keilak to the southwest. Also, a branch from Lagowa meets the main route at Dilling, coming from the southwest used by Messiriya Zuruq.

6. These are dry season dwellings. In the rainy season tents of woven mats and plastic tarpaulins over a stick frame are used to ward off rain. No straw is used and the tents are smaller and less elaborate.

7. Herdowners also purchase available bulls. But uncontrolled breeding frequently occurs with bulls from nearby herds. (Personal Communications from B. Fadlalla and W.T. Bunderson, WSARP).

8. In farming system nomenclature, a characteristic cluster of farm household types or homogeneous grouping with similar enterprise and agro-economic features is termed a «recommendation domain». (See Collinson, 1982). Interventions with appropriate technology are applied to specific types of farmer/pastoralists rather than randomly distributed to all households in an area or production activity.

9. Overgrazed refers to deteriorated rangeland caused by excessive and/or ill-timed grazing over a period of several to many years.

10. Bunderson, W.T. (a). Seasonal patterns of range use by Baqqara pastoralists and their livestock in Western Sudan (in preparation).

Bunderson, W.T. (b). The nature, incidence, and impact of fire on the range-pastoral ecology in an African ecosystem (in preparation).

11. Appropriate technical wording for this range ecology section thanks to W.T. Bunderson (personal communication). On-station tribals of local crop by-products may improve livestock nutrition (B. Fadlalla, 1975).

12. The native Administration was abolished in 1970.

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