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# DEVELOPMENT, DROUGHT, AND FAMINE IN THE AWASH VALLEY OF ETHIOPIA

Helmut Kloos

## INTRODUCTION

While the proximal causes of drought in the Sahel and northeast Africa are known to be due to failure of seasonal rains, possibly linked with long-range climatic changes (Tanaka et al., 1975; Winstanley, 1973; Kelley, 1975; Lamb, 1977), the more persistent problem of human adaptation and survival in increasingly man-made environments during natural disasters is only gradually being appreciated. In recent years emphasis has been placed on man's activities as the major cause of rangeland degradation and famines. It is becoming increasingly clear that drought and famine do not always reflect cause-effect relationships and that the two may coexist independently and often become linked only through politico-economic conditions (Wisner, 1977; Lofchie, 1975; Ball, 1976; Franke and Chasin, 1980: 5; Grossman, 1981; Grove, 1979). In Ethiopia the famine in highland areas in 1972-74 was closely linked to the prerevolution feudal regime (Fitzgerald, 1980; Hussein, 1976; Koehn, 1979; Shepherd, 1975). In the lowlands Bondestam (1974), Cohen (1977) and Flood (1976) associated famine with recent encroachment of pastures by irrigation schemes and with reduced river flooding caused by construction of Koka Dam. However, interaction of physico-environmental and politico-economic factors resulting in the 1972-73 drought and famine and the adaptive responses of the pastoralists in the Awash Valley remain to be studied in depth. The objective of this paper is to examine these relationships among the 130,000 Afar and the 16,000 Kereyu, Arsi and Jile Oromo, the four pastoralist groups traditionally inhabiting the Awash floodplains. The ongoing irrigation development in the Awash Valley with World Bank assistance and the recurrence of drought since 1973 ("Ethiopia", 1981; Kloos, 1977: 215) make this a timely study. The floodplain ecosystem, although for centuries providing much-needed grazing resources during the dry season, has been relatively neglected in the study of human ecology in Africa (Scudder, 1980: 383). Field work was carried out in 1972/73, 1975/76 and 1982. This was part of disease ecology studies of schistosomiasis and other parasitic infections, irrigation development and migration patterns in the Awash Valley and surrounding highlands (Kloos and Lemma, 1974; Kloos, 1977; Kloos et al., 1981; Kloos, in press) and of a cholera vaccination program in the lower Awash Valley.

### THE AWASH VALLEY AND ITS INDIGENOUS POPULATION

The Awash Valley, a 70,000 square kilometer area of the northern Ethiopia Rift Valley, consists of lowland below about 1,500 meters of the larger Awash River drainage basin (Figures 1 and 2). The 1,200-kilometer Awash River and its tributaries originate in cool, humid highlands at 3,000-4,000 meters, where annual precipitation is 1,000-1,600 millimeters. Rainfall is highly seasonal, confined to the periods of the "small rains" (February-March) and "big rains" (July-September), resulting in marked fluctuations in river discharge. Precipitation decreases and temperatures increase toward lower elevations, reflected in the vegetation zones, which range from degraded montane savanna and forest on the high plateaus (2,500-3,500 meters) to woodland and tree savanna (1,200-2,500 meters) and predominantly tropical dry grass savanna and semi-desert interspersed with volcanoes, basalt flows, dunes and rock deserts in the lowlands. All tributaries of the Awash in the lowlands except the Arba Dima, Kessem, Kabena, Borchenna and Mille usually dry up after the rainy seasons. The grass savannas, swamps and riparian forests on the floodplains of the Awash River (see Figure 2) formerly constituted islands of lush vegetation and the only dependable dry-season grazing areas in these harsh lowlands. The semi-aquatic and highly nutritious grasses *Echinochloa sp.* and *Vossia cuspidata* around the seasonal and permanent swamps supported much higher densities of livestock, especially cattle, than the fire-resistant grasses of the savannas and steppes outside the floodplains, most of which are palatable only during the early growing stages and rapidly become stemmy and coarse, or the annual grasses of the subdeserts and deserts in the northern third of the Awash Valley. The riparian forests consisted primarily of *Tamarix*, *Acacia*, *Mimosa* and *Tamarindus* trees, and a dense underbush, providing excellent browsing for camels and goats and also helping to sustain cattle, sheep and donkeys. The Debne Afar alone distinguish more than forty useful plants (Balicki, 1973). The environmental diversity and the overlap or separation in grazing and browsing habits of the five kinds of stock were important factors influencing the structure and movements of herds in the Awash Valley. The seasonal silt-laden flood waters that inundated this zone for several months after the rains maintained the high biological productivity of the floodplains. Only the Jile, Arsi, Kereyu and Afar occupied the Awash floodplains before the recent introduction of commercial irrigation agriculture.<sup>1</sup>

There have been no detailed socio-anthropological studies of the Jile, Arsi, Kereyu or Afar (Figure 2).<sup>2</sup> The following description of their traditional economy thus relies on information gathered through interviews with tribal and clan leaders, field observations and accounts by travelers, and Afar writers and development "experts". Although social organizations varied among tribes and the Afar population was more segmented and diversified than the smaller Kereyu, Arsi and Jile populations, patrilineal clans and lineages appear to have constituted the most cohesive group structures throughout the study area. It is at the clan level that the strongest and most effective leadership structures were found in all groups except among the Afar of the lower Awash Valley, who developed a more centralized state under the hereditary rule of the Sultan of Aussa. In addition to being their traditional and religious leader, he also controlled external relations, the distribution of land and water rights and exercised legal functions (Lewis, 1969a: 163). Each clan had as its external representative a clan chief (*balabat*),<sup>3</sup> whose powers were shared and controlled by elders, who functioned mostly as arbitrators and judges in the internal affairs of clans. In recent decads balabats also

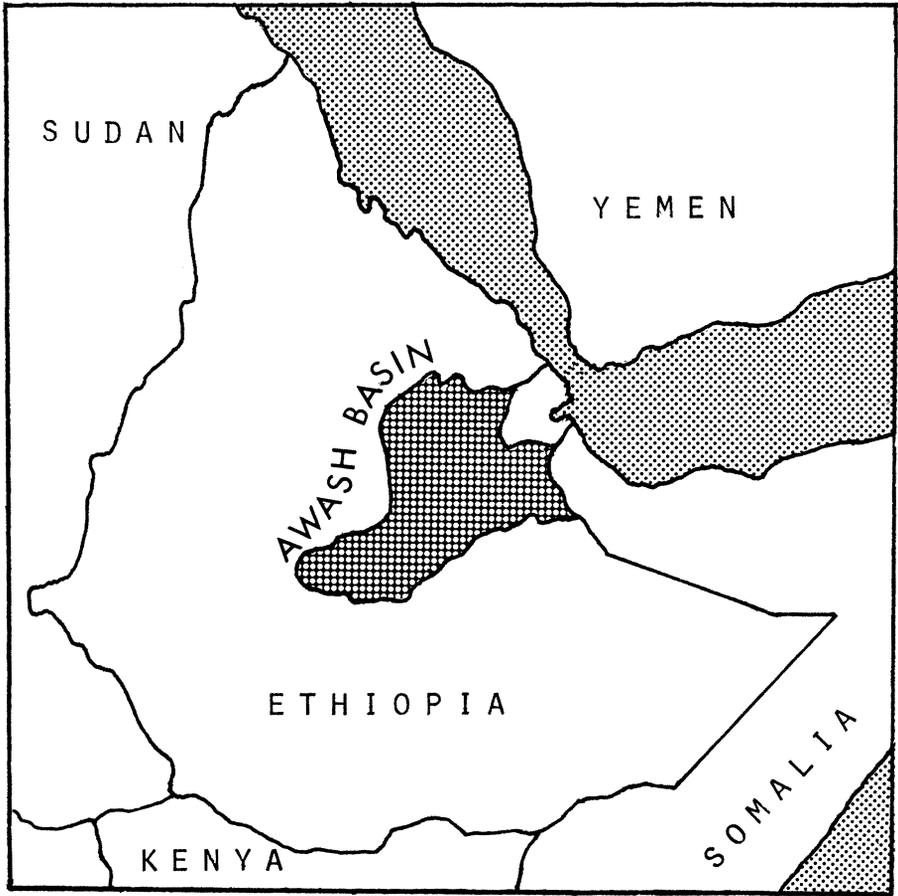


FIGURE I

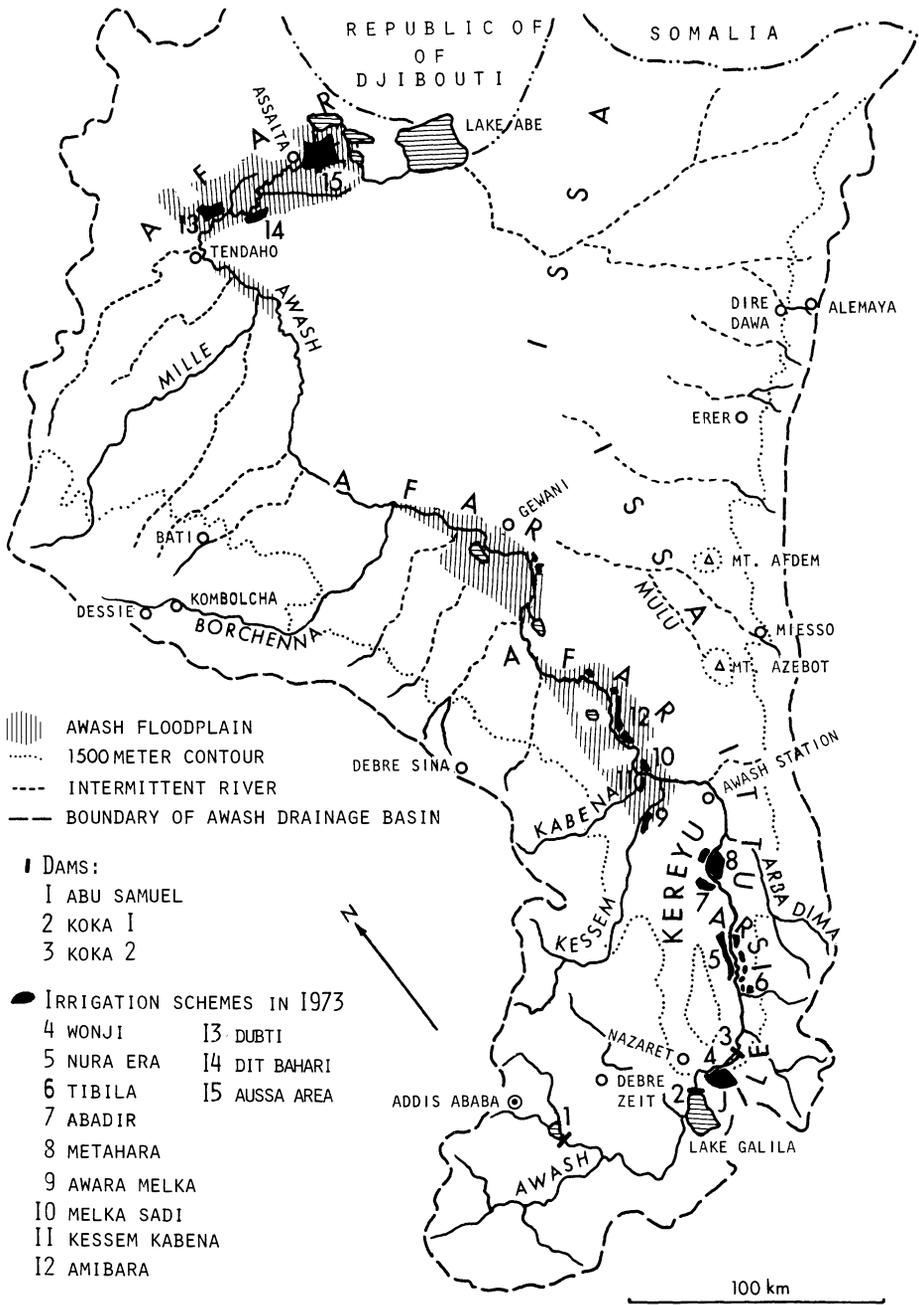


FIGURE 2

became local tax collectors for the central Ethiopian government. Among the Afar the *faima* or (voluntary) young men's association executed the decisions of the balabat and elders (Voelkner, 1974: 11) but also functioned to regroup, unite and integrate members of different tribes and fractions through mutual aid and protection (Ahmed, 1967; Abdalla, 1967). Although the *faima* is basically an egalitarian organization, its aims varied regionally. In Aussa the *faima* was an association of land and cattle owners and in coastal locales it was based on age groups. The chief of the *faima* was in every case a respected judicial authority (Ahmed, 1967). Cohesiveness within Afar society was also sustained by the practice of cross-cousin marriage, a son being expected to marry his *absumah*, or daughter of a maternal uncle (Savard, 1970; Chedeville, 1966). The Afar consider these and other leadership structures and social institution of lengthy debate and mediation and payment in livestock or almost every crime, even murder, to be essentially in controlling and channelling their characteristically independent and hot-tempered kinsmen (Voelkner, 1974: 11). Little is known about tribal leadership in the study area but it appears that only the Afar, who consist of two branches, the Asaimara (in the Gewani and Aussa areas) and the Adoimehara (in the remaining parts of the Awash Valley) recognize tribes (*mela*) and confederations of linked groups which are headed by *makabans* or tribal leaders (Chedeville, 1966; Emmanuel, 1975). Afar tribal chiefs functioned in the past only temporarily, during raids and wars with non-Afar neighbors (Voelkner, 1974: 9). The Afar, speaking Afarinya, are also linguistically distinguishable from the other three pastoralist groups, who speak Orominya, another eastern Cushitic language (Bender, 1976).

Different land tenure systems existed in the farming and pastoralist areas. In the agropastoral Aussa area individual free-hold, sharecropping tenancy on Sultan—and *malak* (subchief)—generated land and communal holdings (primarily pastures) prevailed. Elsewhere, communal ownership at the lineage, clan and tribal levels constituted the only form of tenure throughout the Awash Valley. Land and water disputes were arbitrated at the clan, tribal and sultanate levels. Land was divided among all children of the owner and sale of land to outsiders was rare. To alleviate fragmentation and diminution of plot sizes resulting from the inheritance system, heirs in the Afar area either took up livestock herding or sharecropping, or cleared and developed new land (Emmanuel, 1975; Cossins, 1973). The pastoralists in the study area resided as socially and economically well integrated groups in hamlet— or village-sized settlements consisting of movable huts or temporary brush shelters and seasonally moved in response to climate and the needs of their livestock.

An estimated 3,000 Jile remain in the upper part of the Awash Valley, primarily around the Wonji sugar cane estate and the man-made Lake Galila. Before their displacement from these floodplains they maintained large herds of cattle and some small stock (sheep, goats and donkeys) and raised maize, chickpeas, beans and pumpkins in the seasonally inundated areas after the flood waters receded. They remained for eight to nine months on the floodplains, abandoning their dispersed homesteads and small fields for higher grounds only with the arrival of the flood waters and returning when these waters receded (September or October) (Mehratu, 1967). The Jile frequently fought with the Arsi (Arussi) (Rey, 1924: 91). Although some Jile have converted to Christianity and Islam, most of them adhere to animism.

The Arsi inhabited the Nura Era floodplain, now completely covered by the irrigation scheme with the same name, and the savanna in the hilly Tibila area. They also cultivated crops (barley, maize, sorghum, beans) in their dry season areas on the floodplains and on small rainfed fields at higher altitudes and practiced transhumance with their cattle, which they valued higher than camels and goats. The Arsi migrated between their dry-season villages on the floodplains the west-season pastures in the foothills and highlands of the Somali Plateau, occupied by the large Arsi farming population (Haberland, 1963: 774, 784).<sup>4</sup> Perhaps half of the Arsi in the Awash Valley are now Moslems, but various forms of the old Oromo religion, described in detail by Huntingford (1969: 74-86) persist. The old *gada* political system, still functioning among the Borena pastoralists of southern Ethiopia (Legesse, 1973), has apparently ceased to exist, the balabats and elders now wielding most power.

The Kereyu, a population somewhat larger than the neighboring pastoral Aris of 5,000, already occupied the savannas between the Kesseem and Awash rivers when Harris (1844: 209) visited the area in the mid-nineteenth century. The Kereyu did not cultivate the soil until the 1950s. Migrating instead with their cattle between the dry-season villages on the Awash floodplains at Abadir and Metahara. Irrigated agriculture now occupies the former dry-season grazing areas, and Awash National Park has taken over the wet-season pastures around Mt. Fantale (north of Metahara scheme), the Kesseem River and adjacent grasslands. The Kereyu always returned to the same watering points and grazing areas along the Awash. In recent decades they appear to have developed a clan structure, with at least two clans, the Baso and Dulecha, since an Amharic document from the 1930s emphasized that the Kereyu were not segmented into clans (Tubiana, 1966). The Kereyu also began to mix and intermarry with Ittu pastoralists whom the Issa Somali recently pushed into the vicinity of Metahara. The Kereyu continue to fight with the Afar, however, their major competitor for grazing land and water sites. About half of the Kereyu have given up animism for Islam, and a few, for Christianity, including one balabat.

The Afar, the largest and most specialized pastoral group, number approximately 130,000 in the study area (Kloos, 1977: 41). Their large territory covers the Awash Valley downriver from Awash Station, the Danakil Depression and part of the Republic of Djibouti (Lewis, 1969a; Map). Beginning with the Portuguese missionary Don Alfonso Mendez, who in 1625 traveled through the Awash Valley (Telles, 1710: 224-227), many travelers have commented on the isolation and semiautonomous status of the Afar within the Ethiopian empire. The Afar remained fiercely independent, even though in 1895 Emperor Menelik forced the Afar Sultan of Aussa to pay tribute, and the completion of the Addis Ababa-Djibouti railroad in 1901 and of the Addis Ababa-Dessie-Assab road in the early 1930s opened up parts of their territory. The cattle tax levied by Emperor Haile Selassie on all herds in the Awash Valley contributed to exposing region's pastoralists to outside influences, including the money economy. Only in the Aussa area, between Assaita and the four Awash delta lakes (Figure 2), have the Afar traditionally practiced irrigation agriculture, growing maize, sorghum, and date palms, using canal and flood irrigation and slaves (Kloos, 1977: 160). The Aussa Sultanate emerged with several lesser sultanates and sheikhdoms during the religious wars with Ethiopia in the sixteenth century (Lewis, 1969a; 157). Its social organization, consisting of both the traditional Afar system of tribal chiefs, clan chiefs and lineage groups and the malak system of land and water managers,

which evolved as a societal response to the demands of irrigated farming some 150 years ago, is unique to the Awash Delta (Cossins, 1974).

Two basic migration patterns prevailed in Afarland: relatively short movements between dry-season villages on the floodplains and wet-season pastures on the higher plains outside the riverine lands, and more extensive movements between dry-season villages and more distant arid areas and highland pastures. At the beginning of the rains families and clans moved with their portable reed huts short distances of five to thirty kilometers to wet-season areas to escape the river floods and mosquitoes and avail their livestock of the new grasses. Small stock and milch cows remained in the camps for a regular milk supply while boys and young men took bullocks, dry cows, and camels to more distant grazing areas. With subsidence of the flood waters (October-November) the Afar returned to the floodplains, grazing their livestock on the receding swamps and lake margins. Although most groups moved once a year, others on flood-protected sites on the plains moved hardly at all (Voelkner, 1974: 20). The agropastoralists in the Aussa area normally kept their livestock on uncultivated fields during high river stage, unless forced by the floods to move to higher ground, and after harvest on stubble (Cossins, 1974). This pattern of heavy floodplain use contrasts with the second type of migration, characterized by more extensive movements of thirty to two hundred kilometers. It alternates between wet-season grazing areas with ephemeral grasses in the deserts and subdesert steppes in the lowlands and highland pastures and crop residues at the ethnic pastoralism/farming boundary along the escarpment of the Central Ethiopian Plateau. These movements prevailed in areas west of the Awash and throughout the northern part of the region and are similar to the long-distance migrations of the coastal Afar and the Issa Somali (Lavison, 1966). The movements into the highlands provided not only grazing for cattle and camels, but also opportunities for trading animals, skins and rope for grain, cloth and coffee (Weissleder, 1978). Contracts between farmers and pastoralists, payment of tribute and granting of reciprocal grazing rights (Emmanuel, 1975: 21, 22) made highland grazing by the Afar possible. However, land use in this frontier area never evolved into the symbiotic relationship between farmers and pastoralists described by Horowitz (1979: 74) and Scott (1979) for the Sahel, partly due to persisting conflicts over land and to cattle raids in the absence of strict government control (Emmanuel, 1975: 22).

Other movements were in response to warfare, mainly with the Issa but also with the Kereyu, Ittu (Thesiger, 1935: 2; Tubiana, 1966), between Afar tribes (Thesiger, 1935: 7), and for various other reasons, such as deterioration of grazing land around dry-season villages.

The caravan trade provided considerable amounts of revenues for the Afar and represented the major link with the outside world until the 1930s. The Aussa Sultanate levied taxes on all goods passing through its territory and the Afar provided guides and escort (Nesbitt, 1935: 196-98; Paulitschke, 1893: 304). Arab merchants from the coastal towns (Lewis, 1969a: 162) and Oromo and Argobba (Moslems) from the highlands, who had carried on most local and interregional trade for centuries, were joined by Afar traders after institution of the cattle tax and construction of the railroad and all-weather roads (Weissleder, 1978). Trade had always centered on Aussa, the cultural and economic center of the Afar territory (Nesbitt, 1935; Trimmingham, 1952: 172). Afar outside the Aussa area, like the Borena, pastoral Somali, Turkana and Samburu (Baxter, 1975: 214), subsisted almost entirely on their livestock, even during the harshest years

(Voelkner, 1974: 32).

As a means of supplementing their predominantly milk diet, pastoralists throughout the Awash Valley gathered wild plants during seasonal food shortages. All groups reportedly gathered the fruits of tamarind (*Tamarindus indica*) and tubers of several swamp plants. The Afar sought the tubers and seedpods of water lilies (*Nymphaea caerulea*), which they prepared as a porridge with milk, rhizomes of bulrush (*Typha sp.*), gathered after burning the stems, and the sweet roots of the swamp grass *gedleboya*. Ethnobotanic reports of extensive knowledge and use of wild food and medicinal plants by other pastoralists (Bailey and Danin, 1981; Bernus, 1980; Grivetti, 1981; Morgan, 1981) suggest that the study populations and their herds formerly made greater use of plant species available to them than the present study reveals. The Afar also occasionally hunted kudu and gazelles, using horses, obtained other meat from a low-status caste of smiths and hunters (Balicki, 1973), as well as hippopotomus meat (Thesiger, 1935: 2; Nesbitt, 1946: 138). However, like the Kereyu and Arsi, the Afar avoided fish. Seasonal food shortages, along with warfare, endemic malaria and epizootic diseases, all apparently represented strong ecological controls on population size, although no reliable data are available.

#### DEVELOPMENT AND DROUGHT IN THE AWASH VALLEY

Until about 1950 highland Amhara and Oromo considered the Awash Valley to be a malarious, economically useless region, avoiding it whenever possible (Mariam, 1964). At that time irrigated agriculture in the valley was confined to a few small concession farms (Pankhurst, 1968: 208-209) and the subsistence farms in the Aussa area. Attitudes gradually changed with development of the Wonji sugar cane plantation in the early 1950s and construction of the Koka high dam a few years later generated employment for thousands of highland laborers, revenues and export crops and facilitated the development of capitalist agriculture (Kloos, in press). The Third Five-Year Plan (1968-1973) by the Ethiopian Government (Imperial Ethiopian Government, 1968), which dealt with development of river basins through commercial agriculture, gave priority to the Awash Valley, owing to its favorable location near major domestic markets and transportation routes.

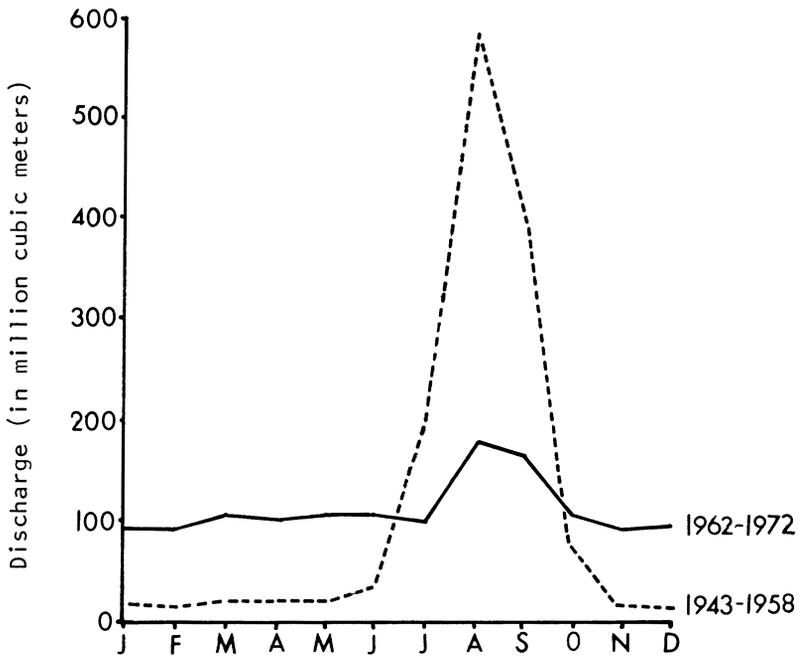
In 1962 the government formed the Awash Valley Authority (AVA) to administer and develop the natural resources of the region. Its preliminary feasibility studies (FAO/UNSF, 1965) encouraged large-scale cotton and sugar cane cultivation on the Awash Valley floodplains, mostly by foreign concessionaires. In 1973, 52,370 hectares were irrigated on twenty-three commercial schemes, including nineteen farms ranging between fifty and one-thousand hectares in size and twenty-five hundred small plots of less than ten hectares under the rule of the Sultan of Aussa. Nearly 26,000 hectares were in the upper valley, 7,700 hectares in the middle valley and 30,400 hectares in the lower plains. Seventy-seven percent of the total irrigable area of the upper valley was thus irrigated, but only 14.2 percent in the middle valley and 43.0 percent in the lower plains (Kloos, 1977: 215). Fearing increasing encroachment of his land by outsiders, Sultan Ali Mirah Hanfare began his own program of commercial agriculture in the lower plains in the late 1960s, outside the jurisdiction of AVA's policies. He converted riverine grazing land and small owner-occupied maize farms into larger cotton schemes. In the delta area clans commonly leased community-owned land to large farmers and malaks. Already in 1970/71, 65

percent of the cotton was planted by only nineteen farmers, who represented 1.5 percent of all landowners (Hogg, 1972; Bondestam, 1974). By 1973, 23,000 hectares were under cultivation (Imperial Ethiopian Government, 1974), displacing many Afar and leaving others landless. The Sultan and his friends and malaks, on the other hand, became even more powerful (Bondestam, 1974: 538; Emmanuel, 1975: 21,25).

Thus, whereas the Sultan had the resources, administrative infrastructure and business acumen necessary for successful commercial agriculture and, in that way, could forestall rapid loss of Afar land to outsiders, other pastoralists in the Awash Valley became largely victims of progress. In Ethiopia, as in many other countries and regions, ownership rights of pastoralists are not legally recognized by the government. Such rights, which can be granted to individuals only on the basis of land grant orders, were not given to the Afar (Emmanuel, 1975: 24). This was the root cause of land tenure and land use problems. By 1973, 67 Afar representatives had filed applications for grants, indicating their continued use of the land and payment of cattle taxes (Emmanuel, 1975: 25). Even in the upper valley, where a few individual pastoralists did acquire land through land grants, the issue of ownership rights was preeminent (Emmanuel, 1975: 23-24).

Three dams have been built on the Awash since 1960: Abu Samuel, Koka 1 and Koka 2. The purpose of Koka 1, with its 230 million cubic meters, by far the largest of the three, is to provide hydroelectric power production for Addis Ababa. Impoundment of Awash water and fairly uniform monthly releases from the two Koka dams sharply reduced the seasonal floods downstream. The proportion of total annual Awash water discharged during the large rains (July to September) at Wonji fell from 84 percent prior to the dams to 35 percent after their completion in 1960 (see Figure 3). The new river-flow pattern completely eliminated floods from the upper valley and significantly reduced them in the middle valley, though in the plains the Awash retains a more pronounced seasonal flow pattern, owing to the still unregulated tributaries (see Figure 4). After 1972, reservoir releases were modified to increase water supply to the irrigation schemes during the dry season months of March and October, which permitted cultivation of an additional 25,000 hectares (Walker, 1974). Water demands at the schemes in 1973 ranged from 25.7 million cubic meters in February to 66.6 million cubic meters in July (Gibb and Partners, 1975). Low river levels during the dry season prevented double cropping and occasionally caused delays in crop planting. Two additional dams, one on the Kessem River and the other on the Awash at Tendaho, and diversion of water from a tributary of Lake Zuay (Imperial Ethiopian Government, 1974), to be completed during the 1980s, are designed to provide sufficient water for future irrigation development. The presence of many dead trees in the riparian forests and shells of swamp-living aquatic snails on desiccated and cultivated parts of the floodplains, as well as accounts by old Afar men of flood and vegetation changes within the past twenty years, all point to increased aridity in these river bottomlands. Eventually, large stretches of riparian forests may die, an ecological impact also expected along the Senegal River after completion of the Manam Tali Dam (Thayer Scudder, personal communication, 1981). Dikes built along the Awash to prevent crop damage from water in the vicinity of most irrigation schemes reduced flooding further.

The irrigation schemes in the Awash Valley have displaced an estimated 20,000 pastoralists. Most of them appear to have remained near the farms, resulting in crowding, overgrazing and destruction of the remaining pastures. The



Source: Based on unpublished data of the Awash Valley Authority

FIGURE 3.

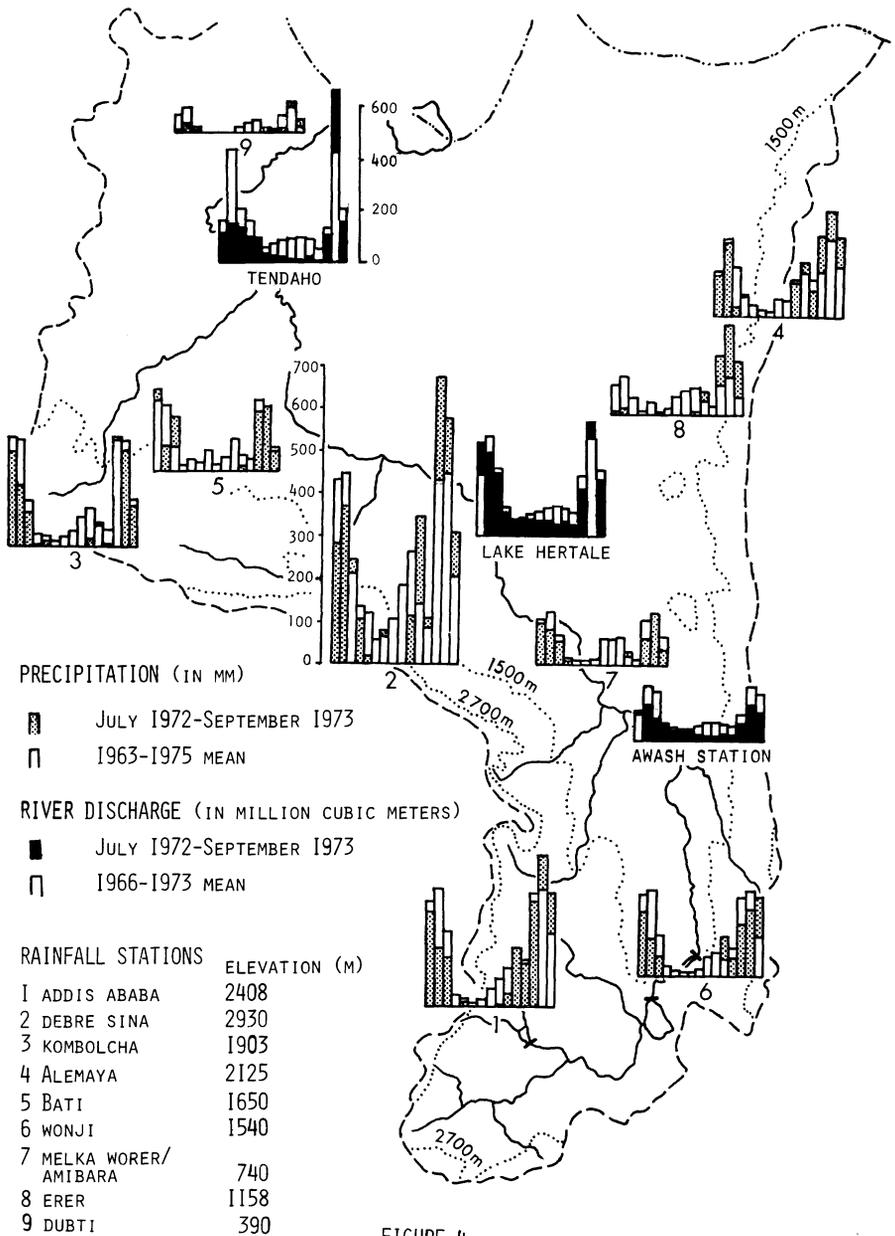


FIGURE 4

irrigation schemes blocked migration routes and livestock watering points of some groups, particularly the Arsi at Nura Era and the Afar in the Melka Sadi/Amibara and Aussa areas. The clearing of riparian forest for the farms and use of trees for the construction of labor camps and fuel for the 150,000 farm laborers inhabiting the irrigation schemes (Kloos, 1977: 76) have contributed significantly to reducing forage resources in these development areas. Even in the lower plains, where all trees were said to be protected by the Sultan, the same practices became widespread around the concession farms. By 1973 only about 300 Afar families had been settled by AVA on 2.5 hectare cotton plots on the Amibara and Dubti settlement farms as compensation for loss of their land to the schemes. Although compensation rights were recognized by the government, the great majority of Afar, Kereyu, Arsi and Jile received no land for resettlement (Emmanuel, 1975: 11-13). Migrant farm laborers from the Ethiopian highlands greatly outnumbered the indigenous populations on all irrigated farms except those of the Sultan (Kloos, in press). The emphasis on cotton and sugar cane production with limited cultivation of maize and vegetables for the resident farm labor populations precluded distribution of locally-grown food to destitute pastoralists and led to the establishment of famine relief stations near most farms. These stations, together with the prospect of grazing on the floodplains, stimulated immigration of many pastoralists from drought-stricken areas. After failure of the winter rains in coastal areas and of 1973 spring rains in the foothills of Wollo Province, 50,000 to 100,000 cattle, camels and goats converged on Dubti and Dit Bahari and later the farms of the Sultan. Eldrin, DDT and organophosphate pesticides on the cotton plants allegedly contributed to increased livestock mortality. Disputes between pastoralists and non-Afar concessionnaires resulting from this and earlier incidences bearing on the conflicting interests of farmers and pastoralists reflected underlying attitudes of the Afar toward all outsiders, including AVA officials. The Afar increasingly viewed non-Afar concessions and migrant farm laborers and settlers with suspicion, considering them a threat to their economy, culture and security. The closure of a major breakaway stream that had maintained large swamps and grasslands, carried out by the AVA to provide sufficient irrigation water for the Dit Bahari scheme, led to deterioration of pastures east of Dubti. Although the Afar were initially appeased by provision of canal water (Ayele and Juhasz, 1970), conflicts over water use eventually reappeared, leading to serious confrontations between pastoralists and the AVA. The AVA, which had jurisdiction over the control of water and land uses, could not induce local Afar to sign concession agreements for use of water which they considered their own property (Voelkner, 1974: 19, 25). A general disregard for burial sites and other sacred places of the pastoralists added to the resentment they felt toward developers and migrant laborers. The construction of a road across an Afar burial place near Gewani resulted in the shooting of several laborers.

Increased cattle raiding and warfare due to dwindling grazing resources contributed to overstocking of the floodplains. In the middle valley several thousand Afar of the Waima tribe, under pressure from the Issa, moved from areas around Mt. Afdem, Mt. Azebot, and the Mulu River to the Melka Sadi Amibara Plain. The expansion of the Issa into the lands of the Afar and Ittu was part of a general westward movement of other pastoral Somali (Lewis, 1961: 71) and encroachment of the Somali's pastures by highland farmers (Voelkner, 1974: 25). The displaced Ittu settled on already overstocked lands of the Kereyu, who had lost all their floodplain pastures to the Metahara and Abadir schemes, and

their best dry-season areas to the 80,000-hectare Awash National Park.

Expansion downslope of dry farming into grazing areas along the escarpment of the Ethiopian Plateau in eastern Shoa and in Wollo and Tigre provinces led to clearing and cultivation of steep slopes, leading rapidly to erosion and deterioration of highland pastures. The sedentary farming population had sharply increased after control of malaria and pacification of rival groups. Extension of roads and state power in recent decades contributed to overpopulation (Emmanuel, 1975: 22-23; Weissleder, 1978). Thus by 1960 this ecologically fragile zone had higher population densities (100-150 persons per square kilometer) than any other part of the Awash Basin (Mariam, 1964: Map 4). With the appearance of marked drought conditions in 1971 (see Figure 5) the Afar could no longer rely on the highland markets, Galla and Amhara farmers no longer honored past land use agreements with pastoralists (Emmanuel, 1975: 22), and the pastoralists were unable to obtain grain after the poor crop harvest in 1972. The price of scarce grain supplies became prohibitively high to the pastoralists, whose cattle fetched less than one-tenth their normal price (Mason et al., 1974). The marginal agricultural lands along the eastern escarpment of the Ethiopian Plateau became the focus of the drought (Ethiopian Nutrition Institute, 1973; Holt and Seaman, 1976: 5; Wetherell et al., 1979: 138). In 1971 the government began to distribute famine food to the Afar along the Bati-Assab road after failure of the rains, which caused the first major crop failure in these marginal areas (Holt and Seaman, 1976: 2).

Woodcutting and charcoal production by farmers along the Addis-Awash Station, Addis Ababa-Shashemene and Bati-Assab roads for use in the capital city and other large towns in the Awash River Basin resulted in large-scale destruction of acacia woodlands and deciduous bush vegetation in the wet-season grazing areas. The highly beneficial effects of *Acacia* and other leguminous trees on the productivity of farmland and the carrying capacity of rangelands is now well known (Felker and Bandurski, 1979; Scott, 1979: 18). The Kereyu-occupied scrublands and woodlands west of Metahara and the Jile lands around Lake Galila were the foci of woodcutting activities. Increasing automobile traffic generated by the agricultural development and tourism provided for transport of the fuel, encouraging several hundred farmers from drought stricken areas to earn much needed supplementary income. The heavy traffic brought both opportunities and threats into the valley: new markets in the mushrooming roadside towns and irrigation schemes, increased regional traffic, and new levels and kinds of diseases.

### RAINFALL AND RIVER FLOODING

Although few long-range climatic data exist for the Awash lowlands below 1,500 meters, and the great spatial variation of rainfall in the region renders available data from the relatively few rainfall stations in the Awash River Basin of limited value, several distinct patterns can be discerned. These patterns are reflected in the Awash discharge, particularly at Tendaho town in the lower valley, where the regulatory effect of the high dams is least noticeable. Below average precipitation was reported by all major stations in the basin for the period between the beginning of the large rains in 1972 (July) and the large rains in 1973 (July). The small rains in 1973 generally failed completely and no precipitation was recorded between November 1972 and April 1973 at most stations (see Figure 4). Reduced river discharge (Figure 4) was insufficient to flood any plains during the early part of July (the usual time of onset of flooding), except on some plains

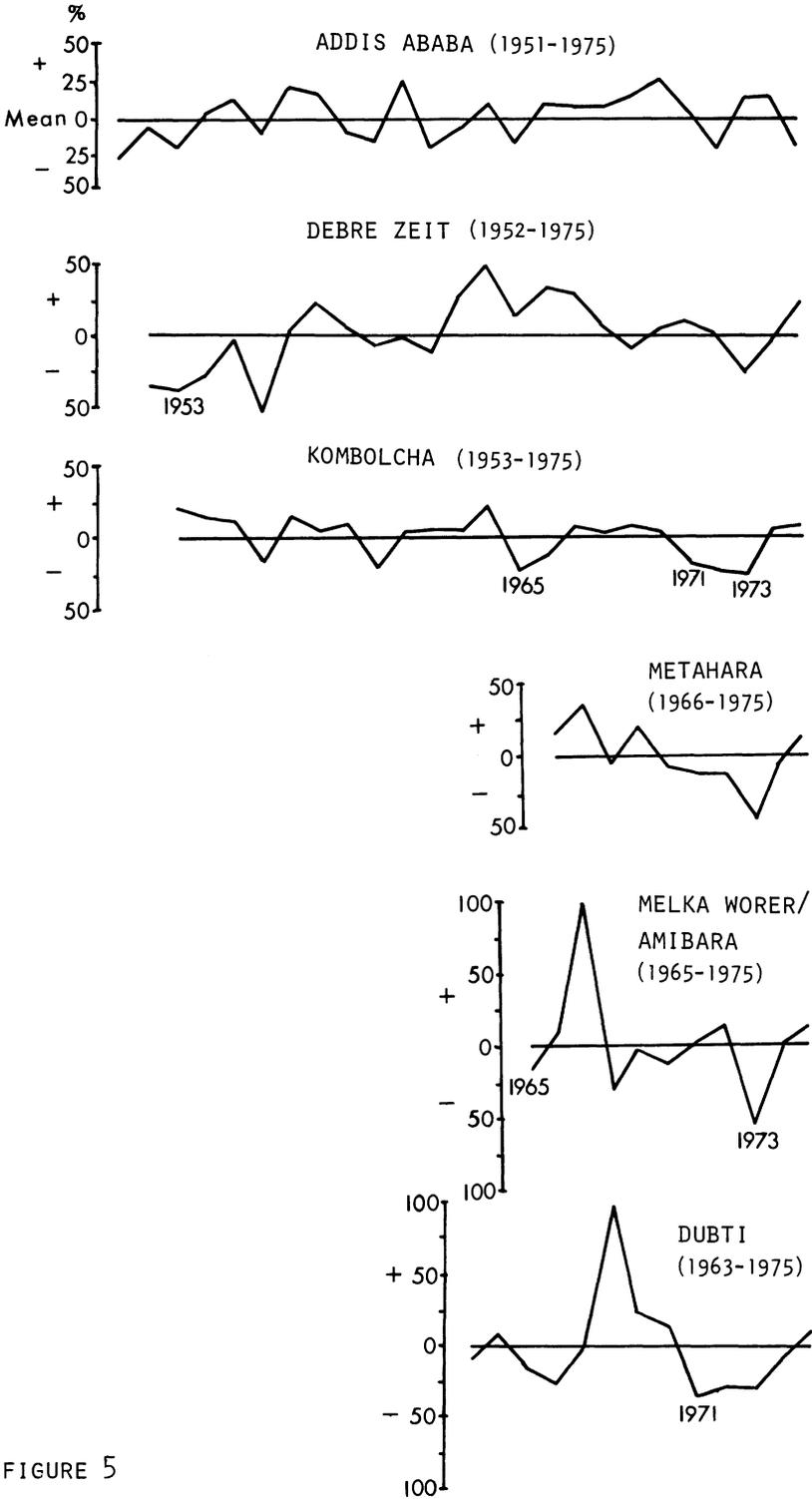


FIGURE 5

around Gewani, delaying the planting of cotton and maize in the Aussa area by one to two months and exacerbating the grazing problems of resident and newly arrived pastoralists.

The longest periods of well-below-normal rainfall were recorded in the eastern highlands (Kombolcha) and lowlands (Dubti). Similarly, the greatest variations from the mean were recorded in the lowlands (Metahara, Melka Worer/Amibara and Dubti) (see Figure 5). The meager rainfall and reportedly reduced flooding during three to four consecutive years before rainfall normalized in 1975 contributed to setting the stage for the disaster that occurred when the small rains failed in 1973. Some indicators of the magnitude of the drought and famine, including mortality, morbidity, adaptive responses and social stress, are discussed below. Precipitation and river flooding returned to normal levels in August 1973, and after the quite heavy rains in 1974 and 1975 (see Figure 5), herds were largely rebuilt and most surviving children had regained their normal weights. It would have been difficult for the casual visitor to find any indication that the Awash Valley pastoralists had recently experienced one of their worst food shortages, although some denuded floodplain pastures remained in the vicinity of the middle valley cotton irrigation schemes, where population pressure had been particularly strong.

Historical records show that droughts had periodically occurred in Ethiopia since the eleventh century (Wood, 1977) and that cattle plague and rinderpest destroyed livestock throughout the country, including the Awash Valley.<sup>5</sup> The more recent droughts of 1953 and 1965 (Wood, 1977) show up in the records of most highland and lowland weather stations (see Figure 5). When questioned about the relative severity of these droughts, most herdsmen said that the one in the early 1970s was the worst period of food scarcity that they had ever experienced.

### MORBIDITY AND MORTALITY

The fragmentary and largely unreliable information on drought-related morbidity and mortality obtained during nutrition and retrospective interview surveys in limited areas has hindered health impact assessment in the Sahel and in Ethiopia (Caldwell, 1977: 93; Holt and Seaman, 1976: 2). Even less data exists on livestock losses in the Awash Valley. The herds and flocks of the Debne Afar began to decline during the 1960s as a result of reduced river flooding and concomitant vegetation changes (Balikci, 1973), but most families reported the total loss of animals only after failure of the rains in 1972/73. Existing evidence suggests that human morbidity and mortality during the famine were closely related to loss of livestock, to epidemics of several infectious diseases, and to a lesser extent to dietary change. According to Voelkner's (1974: 38) interview surveys among 146 Afar families in the middle valley, 19 percent of a total of 775 people in the population studied had died between 1971 and 1973, but only 10.6 percent of the members of the twenty-eight settler families. Equally important, while up to six persons had died, 51 percent of all families in the sample had not lost any members. The differences apparently were due to variations in livestock losses. As may be expected, mortality during the drought increased most sharply in children aged 0-5 (tenfold) and less so among older children and adults (fivefold). Young children also suffered the highest mortalities in the northeastern part of the valley, where the annual death rate amongst the neighboring Issa was 7.5 percent for the year up to June 1974 (Seaman et al., 1978; Ethiopian

Government, 1974). Bondestam (1974) reports that 25-30 percent of all Afar had perished during the 1972/73 famine.

Cholera reached the Awash Valley in 1970, as part of a pandemic, causing hundreds of deaths among thousands of infected persons by early 1971 (Conacher, 1976: 142; Schaller and Kuls, 1972: 109). Another, more localized outbreak occurred in the lower plains in 1973 which, according to local Afar and health officials, killed several hundred people. These must be considered conservative estimates due to the inability of many infected individuals in outlying districts to reach the crowded clinics in Assaita, Dubti and Dit Bahari. Crowding, poor sanitation and hygiene, and lack of adequate medicine at clinics and relief centers during the massive influx of destitute pastoralists and farmers resulted in high levels of enteric infections (Mason et al., 1974). Similarly, the Jile, Arsi, Kereyu and Afar who had been settled on the irrigation schemes were more highly infected with intestinal parasites than were their pastoralist tribesmen (Kloos et al., 1981). Other diseases, according to local health center personnel, took a heavy toll among the emaciated populations. Malaria and bacillary dysentery were particularly dangerous. Cumulative effects of malnutrition and infection can be expected to contribute significantly to morbidity and mortality (Scrimshaw et al., 1968).

Pastoralists who lost their herds and flocks made a drastic change from a predominantly milk diet to one consisting primarily of maize, wheat, protein-fortified foods and powdered milk in the famine relief stations. Although saving many people from starvation, this change was also associated with illness. Improper preparation of the unaccustomed foods caused severe dysentery, indigestion and discomfort, especially in small children. After an epidemic of bacillary dysentery in the middle valley in 1980, caused by the use of powdered milk prepared with contaminated water, the affected Afar groups rejected subsequent shipments of flour out of fear of additional food-linked disease. Some other imported foods were neither acceptable culturally nor suitable for treatment or prevention of malnutrition (Mason et al., 1974).

### RESPONSES TO DROUGHT AND FAMINE

Awash Valley pastoralists practiced well tried and some new strategies to minimize effects of the drought and famine and to rebuild their herds. Apparently all groups intensified gathering of wild plants, hunting, cattle raiding and sale of animals, the latter to buy grain. The Afar around the middle valley swamps seem to have relied most heavily on famine foods, which were particularly abundant in these wetlands. Most Afar, Kereyu and Arsi continued to avoid fish as food during the crisis, disregarding the carp, tilapia and catfish in the Awash and freshwater lakes. Some Afar (Voelkner, 1974: 31) and Jile began to catch and eat fish during recent years of scarcity.<sup>6</sup> Other peoples in the Horn ate forbidden foods during past famines (Pankhurst, 1968: 219; Wood, 1976: 71). I obtained little reliable information on hunting. Although most groups allegedly hunted during the famine, habitat destruction, the establishment of game parks, hunting by resident expatriates, and the scarcity of ammunition and horses limited hunting opportunities.

Traditionally the Awash Valley pastoralists refrained from selling large numbers of cattle, the basis of the economy and the focus of social relations. Moreover, the interregional lowland markets of Nazaret, Awash Station, Bati and Miesso and the large highland markets were already saturated with animals;

farmers in drought-stricken highland areas commonly sold livestock for supplemental income (Wood, 1976: 72). Herders were able to sell few cattle but did sell many goats and sheep on the irrigation schemes and in roadside towns. When the great livestock losses occurred, the composition of the Kereyu and Afar herds rapidly shifted in favor of goats, the hardiest of the animals (Voelkner, 1974: 33; Flood, 1976). Goats helped to alleviate the great milk shortage, retained their body weight and could easily be sold to farm laborers and farmers. When the AVA forbade the Afar settler to keep their livestock on the Amibara scheme, they moved their camps and animals outside the cultivated area. In a desperate attempt to provide feed for their remaining stock, Afar and Kereyu men lopped trees along the Awash and their children gathered the pods of *Acacia nilotica* for livestock feed. Herders were well aware of the destructive browsing habits of goats and made efforts to rebuild camel and cattle herds. The cattle of the Afar and to a lesser extent those of the Kereyu and Arsi, are the only surviving purebred Sanga (Epstein, 1971: 416). These lightweight, highly adaptable animals quickly recover their weight after seasonal droughts and have a good heat tolerance, though young animals grow relatively slowly, and milk production is low (400 liters in six to eight months) (Imperial Ethiopian Government, 1970: 52). The Afar, who rank camels above all other animals (Balikci, 1973), were particularly interested in rebuilding their camel herds, which they valued highly for their milk and as transport animals.

Other responses also varied among different production groups and regions. Shortages of pasture on the floodplains required those groups that had lost land to the Amibara and Melka Sadi schemes to move more often and longer distances with their herds (Voelkner, 1974: 20). Other Afar migrated less frequently after loss of livestock and manpower, considering movement to their desiccated wet-season areas useless (Balikci, 1973; Cossins, 1974) or too dangerous, due to increased livestock raiding (Flood, 1976), a widespread practice followed to rebuild herds. The Afar in the middle valley feared the Issa, who are better armed and more mobile on camelback, and who recently occupied some floodplain lands. In an attempt to maintain some of their grazing resources during the 1980 drought, Afar of the Waima tribe cut the newly built dike along the Awash downriver from Amibara to flood the adjacent dried-up swamps and pastures. Further downstream, on the lush, swampy Gewani Plain, strong protests of the Madima tribe prevented extension of another dike that protects several small cotton schemes that are to be enlarged in the near future.

Most Afar in the Aussa area were optimistic that the rains would return and that their situation would then improve, since they did not recognize all underlying causes of the famine (Flood, 1976). However, many pastoralists in the middle and upper parts of the valley lost confidence in their herding way of life and increasingly looked toward farming as the only means of survival in a hostile environment. Realizing that their land and waters were highly valuable and that the outsiders had considerably greater food supplies than they had, the four pastoralist groups strongly resented agricultural development by these newcomers, who denied them participation in the planning and administration of the farms. Grains and grain products, part of the diet of many Awash pastoralists for several decades, were available chiefly to settlers and migrant farm laborers on the thriving schemes, which produced primarily export crops. Although many destitute Afar and Kereyu women and children who had lost their livestock begged for food and money along the highways, most of the unfortunate herders

considered it necessary to start farming during the peak of the crisis (Voelkner, 1974: 27). When the small rains failed in early 1973, increasing numbers of Afar women and children began to pick cotton and pack bananas on the commercial farms for wages while the men managed the remaining stock. Afar settlers primarily used their womenfolk and highland laborers to do the physical farm work with the technical assistance and management of AVA or the Sultan; meanwhile, with the help of male relatives, they herded their livestock away from the farms. These arrangements gave the settlers a secured food supply through loans from AVA and income from crop sales and allowed them to rebuild their herds. This pattern was also noted by Sörbo (1977) among settled pastoralists in Sudan. The general economic success of the Afar settlers prompted many of their kinsmen to move to irrigation schemes in search of food and shelter. However, although the mean income of individual settler families increased from \$US 700 in 1972 to nearly \$2,000 in 1973-74, partly due to increases in world cotton prices, in the absence of a strong training program they did not develop the skills necessary for independent farming (Harbeson, 1975: 82). Several Afar clans in the middle valley, impatient over their unsettled land claims, took matters into their own hands and started farming by themselves or rented land to highlanders and non-Ethiopians (mostly Arabs) on a 30 percent profit-sharing basis (Emmanuel, 1975: 23; Voelkner, 1974: 42). With the gradual disappearance of the old attitude of dishonor in male physical work, increasing numbers of Afar men began to work in agriculture. Most of them worked as cotton pickers and guards but some became tractor drivers and mechanics. Others showed a high aptitude for accounting and management in the Gewani agricultural school.

Voelkner's (1974) general conclusion that the Afar who took up farming did so as a safer, economically better option in the *long term* rather than as a *short term* option during rebuilding of herds was largely confirmed by our subsequent visits to the valley in 1975/76 and in early 1982. The number of Afar settled on irrigated agriculture had nearly doubled in the Amibara and Dubti settlement schemes. The Galela Dora and Halidebi farms in the middle valley, developed spontaneously by the Afar during the drought, had been enlarged and the number of Afar, Kereyu Arsi and Jile farm laborers on most other Awash schemes as well had increased. Opportunities for wage labor and increased as a result of labor shortages after the land reform in the highland labor source areas (Kloos, in press) and Afar women in increasingly employed by the cotton, banana and pepper plantations for their high quality work. The diet of the pastoralists had become more diversified and in 1982 I noted the first gardens in Afar villages in the middle valley, where melons and peppers grew.

The Kereyu, having lost nearly all their we-season pastures to recent development projects, became even more dependent on the irrigation schemes for wage labor, famine relief food, and water and medical services when the drought struck. Cash income was obtained by men employed as guards on the Metahara and Abadir schemes, from the sale of firewood gathered by women, and from the sale of animals and skins. There Kereyu near the Abadir scheme grazed their cattle in a swamp created by drainage water, which they also used to cultivate small plots of maize. Although balabats negotiated for compensation and decisions were made to allocate land to individual landless herders (Emmanuel, 1975: 23), implementation was lacking. Relations with concessionaires and government officials deteriorated when some Kereyu cattle died after drinking water from the Metahara livestock ponds into which sugar factory waste was discharged, and

when their herds in Awash National park were turned back by park officials.

The Arsi became more integrated into irrigation schemes than the other three groups and were also, for other reasons, relatively little affected by the drought. Several hundred Arsi families dislocated by the Nura Era and Tibila schemes had settled in the late 1960s and early 1970s in these farms among highland farm laborers. The men worked as daily and permanent laborers. Some families kept a few milch cows, sheep and goats around the labor camps for their milk and cash value and no longer migrated outside the farms. The adaptation to a farming way of life by these Arsi and some Afar in the middle valley reflects considerable cultural flexibility and contrasts with the reluctance of the Dasanetch to farm on the banks of the Omo in southwestern Ethiopia (Carr, 1977). The Arsi groups continuing their pastoral lifeway commonly kept their livestock on harvested fields and savannas and thorn scrub near the Awash during the dry season and took them to nearby foothills and highlands during the rains. Maintenance of long established economic and social ties with sedentary Arsi in the more humid highlands facilitated their search for pastures and water during the drought.

The displacement of the Jile from the Awash floodplains by the Wonji scheme, the creation of Lake Galila, and encroachment upon their marginal farmland by highland farmers prevented most Jile from taking refuge in small-scale farming during the drought. The sale of cattle, small stock and vegetables in the Wonji and Nazaret markets gave a little cash to these impoverished pastoralists. Some of the men around Lake Galila became fishermen, using hand nets and hook and selling part of their catch to passers-by on the Addis Ababa-Shashemene road. Their use of fish as food contrasts with the general fish avoidance observed by the Oromo (Huntingford, 1969: 28) and reportedly predates the 1973/74 drought. It is unlikely, however, that these Jile entrepreneurs restocked their herds exclusively by fishing, unlike the Nuer in Sudan (Scudder, 1980), due to the restriction of frequent fish consumption to the large Christian highland population centers during Lent. After the 1972/73 drought, when the seasonality of the lake's level normalized and the Ethiopian Electricity, Light and Power Authority developed a more suitable water-release schedule at Koka 1 Dam, Jile living along the north shore of Lake Galila were able to adapt their traditional farming know-how to lacustrine floodwater recession farming. They now grow maize, chickpeas and vegetables in the lake's rich alluvial soil during drawdown periods after the rains. Harland and Pasquereau (1969) described this system as *decrue* agriculture in the inland Niger Delta.

While these adaptive responses certainly saved many Awash pastoralists from starvation, they also put a strain on social relations. The circulation of livestock, especially cattle (and cattle among the Afar), is important in reinforcing social relations throughout the study area, as has been noted in other parts of Africa (Horowitz, 1972). Domestic animals are not only the economic basis of all study groups, but are also bridewealth, are loaned to kinsmen and friends and given to children and leaders. Thus carrying what Turton (1977) called a "moral component." There are indications that the conventions of sharing and generosity were occasionally replaced by a concern for individual survival during the famine and the years of rapid irrigation development. Some balabats secretly negotiated and signed land-tenure contrasts for the clan without the knowledge of the people, and land disputes among the Afar increased in the lower valley (Emmanuel, 1975: 25). The extent of abandonment, another indication of social stress during famines (Turton, 1977; Pankhurst, 1968: 220), appeared to be

common. The adoption of young Afar and Kereyu children of dead parents by highland-born migrant laborers in the irrigation schemes suggests that surviving pastoralists were unable to adopt these orphans. Although some Afar interpreted the decrease in the Awash floods and the famine as a punishment by God for increased fighting with kinsmen and with the Issa, none of the study populations appear to have lost faith in their social order, unlike the Mursi of southwestern Ethiopia (Turton, 1977), but rather saw the developers as the cause of their hardships. Stealing of food crops from irrigation schemes, and occasional armed attacks on migrant laborers, still reported by farm managements in 1981, were thus sanctioned by Afar clans.

### CONCLUSION

Man-made famine is a recent phenomenon in the Awash Valley. The available evidence suggests that the 1972/73 famine was not caused entirely or primarily by failure of the rains or deliberate overstocking by local pastoralists, but rather by dam construction, large-scale irrigation development that relied almost exclusively on migrant laborers from the highlands and ensuing loss of grazing and water resources and environmental degradation. These changes rendered the pastoralism particularly vulnerable to the climatological drought. The meager rains between 1971 and 1973 were the last of a series of calamities that disrupted local food production systems. This pattern clearly differs from the situation in parts of southwestern Ethiopia (Turton, 1977) and the Sahel (Vermeer, 1981) where plantation development had been minimal and failure of the rains was the primary cause of drought and famine. The isolation of the Awash Valley until two decades ago and presence of strong climatic and ethnic boundaries between the lowlands and highlands prevented development of commercial pastoralists and minimized human and livestock population growth, unlike in modern Somalia (Swift, 1977: 285). The general absence of deep wells and veterinary services in the Awash Valley contributed to maintenance of a dynamic equilibrium between livestock and the carrying capacity of the land prior to the 1972/73 drought. No reliable information is available on whether study groups were affected by an unusually good sequence of rains reported from other parts of the Horn and from the Sahel in the 1960s (Picardi and Seifert, 1976); whether this led to a significant general increase in livestock holdings; whether cattle began to form an unusually large proportion of the holdings, and being the least hardy, contributed to particularly devastating losses when the drought struck. Climatologic data from Melka Worer/Amibara, Metahara, Kombolcha and Dubti (see Figure 5) suggest that rainfall during the 1960s was rather quite normal,<sup>7</sup> defining even more sharply the contrast with Somalia and the Sahel.

Development of the Awash floodplains during the ten years prior to that drought, in addition to upsetting the rational adaptation of pastoralists to their semiarid environment and reducing the rangelands of the Afar, Kereyu, Arsi and Jile, provided few appropriate economic alternatives to them. As a result, they came into the slow but unrelenting grip of an ever-deepening crisis of impoverishment, hunger and environmental degradation. This problem, typical of river basin development in Africa (e.g., in the Zambesi, Nile and Niger valleys), is largely due to the "development from above" pattern and "the myth of the conservative peasant," both of which are incompatible with the formulation of viable, culturally adapted programs (Scudder, 1980: 395). The Awash Valley development activities are an expression of the wishes of the central government

and some aid agencies) to exploit water and land resources more efficiently in their terms. They judge "viability" of programs in terms of offtake of cash and staple crops and have thus far been unable to fit the needs of pastoralism into the equation. The great desire of most Awash Valley pastoralists to manage their own affairs and their willingness and ability to practice mixed farming demonstrate an equal need for "development from below." This study shows that the peripheralized pastoralists in the Awash Valley benefited less from the irrigation schemes than Fitzgerald (1980; 23) indicated.

Although further studies are needed on the social impact of drought and famine, and various patterns of response to it, a framework of social and economic organization that aids the pastoralists in defining and achieving their objectives and restores a sense of responsibility and control over their own lands is a prerequisite for any development program. The poor performance record of most African livestock projects is closely related to the fact that they seldom involve active participation of the pastoralists concerned (AID, 1980: 41), while forced sedentarization nearly always as had disastrous results (Horowitz, 1979: 36). Voelkner (1974: 47-57) suggests that Afar society contains structures of a cooperative and communal nature which are amenable to development of small clan-owned and clan-managed farms and livestock ranches. When interviewed by Voelkner (1974: Table 27), Afar pastoralists and settlers stated that they preferred above all, in order of preference: clan-owned and managed 2.5 hectare farm/ranch, the lineage farm of 2.5 hectares, individually owned and managed 2.5 hectare farm, and the large cooperative farm of at least one hundred hectares worked and managed by forty or more settlers. These responses suggest that the centralized Amibara, Dubti and Aussa settlement schemes designed as models of pastoralist settlement in the Awash Valley, would have to be transformed to adapt them to the needs and social structure of the local populations. The high failure rate of centrally managed, mechanized corporate farms in many developing countries, is generally related, according to Voelkner (1974; 47), to a failure to identify local societal structures of cooperative and communal nature that could be built into and utilized by the cooperative organizational and functional structure. Lack of a realistic training program for this major cultural change and for member management of the new agricultural enterprises, also suggests that the chances of success of such large ventures is small, in spite of their importance and high national priority. Few recommendations for social development of the Awash Valley pastoralists based on surveys in 1968 (Bondestam, 1974) and 1974 (Voelkner, 1974: iv-vi), had been implemented by late 1981. Their recommendations included (1) establishment of communal farms and ranches, (2) phase-out of mechanized, large settlement farms as soon as effective settler capabilities for takeover can be developed by an intensive training program, (3) planned societal changes (social engineering), and (4) a shift in emphasis by government agencies from development implementation and management to guidance, planning and training. The Afar recognize the education will have to play a central role if they are to achieve self management without external assistance. This process is expected to take between fifteen and twenty years and will be least painful and potentially the most successful of existing familiar social institutions; clan land ownership, leadership, lineage group and the nuclear family can be saved and adapted to the new social system (Voelkner, 1974: iv).

Floodplain farms and irrigated pastures may still accommodate the pastoralists who were displaced by the irrigation schemes, which become instrumental in

decreasing the dependence on milk and increase their dependence on crops and sale of meat products, considered by Brown (1973: 73-74) as the only way out of the downward spiral of environmental degradation. While a large proportion of the Awash Valley pastoralists may eventually adopt a more sedentary way of life, it is clear that not all pastoralists are willing to become farmers and that pastoralism will remain the only viable economic form in large areas outside floodplains that are unsuitable for farming. Where comprehensive settlement programs are implemented, the transition from pastoralism to cultivation must be expected to be more difficult and unlikely than among culturally more homogenous populations, such as the Somali (Lewis, 1969b).

Although the 1975 land reform and nationalization of concession farms have been associated with increased food production for domestic consumption (Koehn, 1979: 61-63), most pastoralists were unaffected by these laudable improvements. The new government has continued much of the pre-coup development pattern while developing a newer and more comprehensive development plan and a decentralized administration infrastructure (Pierre Bonnemaison, personal communication, 1977). The land reform provided for settlement of landownership claims by pastoralists (Ethiopian Government, 1975), but has failed to eliminate their socio-political marginality.<sup>8</sup> On the contrary, distribution of the lands of the Sultan of Aussa among ministries of the central government after the sultan's flight from Ethiopia, designed to bring about rural development in the area and to force integration of the Afar into the land reform program,<sup>9</sup> exacerbated land tenure grievances and nurtured old ambitions of self-determination and autonomy (Harbeson, 1975: 84; Pliney the Middle-Aged, 1979: 16).<sup>10</sup> While the government permitted much land in other parts of Ethiopia to revert from modern agriculture to subsistence agriculture (Ottoway and Ottoway, 1978: 80), large-scale irrigation farming continued in the Awash Valley.<sup>11</sup> The proposed high dams on the Kessef and on the Awash at Tendaho and planned cotton cultivation on additional grazing land on the Melka Sadi/Amibara/Bolhamo, Gewani and Dubti/Dit Bahari floodplains demand a sense of urgency in integrating pastoralists into the regional development plan. Dada and Neville Dyson-Hudson's (1975) suggestions for new agricultural systems in the Sahel apply equally to the Awash Valley:

What is needed is integrated agriculture in which pasturing livestock and raising crops are not ethnic specialities, or subsistence oriented, but national activities allowing for market orientation and full convertibility; an agriculture which allows for as much human dignity and personal identity as the old—but within the perpetually uncertain limits of the Sahel—more security.

One settlement scheme approximating this model is the new Rahad government farm in Sudan. Its settlers practice mixed agriculture, keep cattle on the scheme on irrigated pasture, and engage in fruit/vegetable and groundnut/cotton farming (Thayer Scudder, personal communication, 1981). With appropriate, locally-adapted farm organization, management, technology and cropping patterns, similar programs are likely to be successful in the Awash Valley as well. The urgent need for reliable data required for sensitive planning for the needs of the Afar, Kereyu, Arsi and Jile in their changing homelands may be solved by longitudinal, ecological, and sociological studies similar to those recommended by Brokensha et al. (1977) and AID (Horowitz, 1979: 886-891), and to those already carried out by Scudder and Colson (1979). In particular, information is needed on the social and political organization of the Afar, Kereyu, Arsi and Jile; the effects

of external intervention and of voluntary actions of the pastoralists themselves; and the nature of their own adaptive strategies of rangeland and farm management. Without such information needed for development of sound guidelines, the Administration's emphasis on economic revival during the present difficult transition of the Ethiopian economy, the intervening problems of food shortages, recurrent drought and famines in many provinces, complicated by soil loss and environmental degradation (Stevens, 1980: 162; "Ethiopia," 1981; Koehn, 1979: 68) threaten a further impoverishment of basic land and water systems, as well as the way of life of these indigenous Ethiopians.

### NOTES

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1. The intensity of Awash floodplain use, although resembling that of the much larger Niger inland delta, differs in one important aspect. The permanent settlements of the Fulani pastoralists are outside the floodplains, on the plateaus of the Sahel, where they grow millet and sorghum (Imperato, 1972: 68), emphasizing the great dependence of the Awash Valley pastoralists on their riverine lands.
2. The study by Glynn Flood (1976) of the Afar in the lower Awash Valley was terminated by his tragic death.
3. *Balabat* is the amharic title, *kedo abba* the Afar designation.
4. According to Haberland (1963: 772, 774), the lowland Arsi (Arussi), Jile, and Kereyu (Karayu), like the Borena (Borana) and Guji pastoralists, represent secondary offshoots or splinter tribes of the main Oromo (Galla) agricultural tribes in the southern Ethiopian highlands, from whom they separated after the great Galla migrations in the sixteenth century. Haberland's (1963: 785) claim that the Oromo pastoralists in the Awash Valley "show very strong traces of mixture with the Danakil [Afar]" remains to be confirmed by anthropometric and genetic studies.
5. Travellers reported on great livestock losses in the 1880s due to cattle plague in the "Adel [Afar] country" and to rinderpest in the "Danakil area." Livestock diseases, insects, drought and famine also affected the lowlands of southern and western Ethiopia and the highlands (Pankhurst, 1968: 216-223).
6. The concomitant changes to farming and fish eating by some Afar and Jile support the hypothesis by Simoons (1974: 102) that fish avoidance of African pastoralists originated in their scorn for farmers and their ways.
7. There is some evidence that rainfall began to decline already in 1965 in the eastern foothills of the Ethiopian Plateau (Wood, 1976: 70).
8. The concept of marginalization is often used by investigators of African famines (Wetherell, 1978; Wisner, 1977).
9. The nature and socioeconomic impact of peasant associations that were formed among settlers and agricultural Afar, Kereyu, Arsi and Jile and replacement of some *balabats* by "clan representatives" at the direction of the socialist government remain to be studied.
10. Recent complaints of the Relief and Rehabilitation Commission, the successor of AVA in the settlement program, that Afar settlers with their livestock in the lower Awash Valley are too often absent from the schemes and insufficiently involved in on-scheme crop cultivation activities appear to reflect in part the pastoralists' avoidance of the increased socioeconomic pressure under the new socialist regime. Afar settlers have preserved a considerable degree of independence by retaining some of their herds,

which allows them to exercise an "exit option" if pressured too hard by introducers of change and permits them to revert to their subsistence economy, as was also noted by Heyden (1980) in Tanzania. Ongoing extension of the irrigated area, recurrent droughts and environmental change may eventually eliminate this option by forcing the Afar into great dependency on the government and centralized planning. In an effort to reduce such migrations, the RRC has begun to withhold the monthly allowance from settlers who were absent from the scheme during the month. For detailed discussions of Afar political problems and aspirations see Shehim and Searing (1980) and Ottoway and Ottoway (1978).

11. Of the seven Afar settlement schemes managed by the Relief and Rehabilitation Commission in 1981, five were at the site of indigenous farms and settlement schemes earlier developed by Sultan Ali Mirah (Aussa, Dubti and Dit Bahari) and on other Afar farms (Halidebi and Galela Dora, both in the middle valley). Earlier plans by RRC to establish large settlement schemes in the middle valley (Cohen, 1977) had not been implemented by January 1982. The cultivation of larger acreages of grains for local consumption on the newly formed state farms after 1975 represented a major change in agricultural development strategy and priorities but was short lived. In the last 1970s, as part of the new administration's drive to generate more foreign exchange, the production of cotton and sugar cane was increased at the expense of domestic foods. Presently (1982) the irrigation schemes in the Awash Valley obtain most of the food for their labor populations from the highlands. Pastoralists belonging to peasant associations can obtain food on the schemes. This fairly elaborate food distribution system needs to be further developed to prevent occasional food shortages on the state farms.

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