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A GREAT AGRARIAN CYCLE? A HISTORY OF AGRICULTURAL PRODUCTIVITY AND DEMOGRAPHIC CHANGE IN HIGHLAND ETHIOPIA 1900–1987*

By James C. McCann

The ability of the rural population in highland Ethiopia to sustain large state systems, underwrite a political tradition of expansion, and maintain its labor efficiency through the use of the plow has recently run afoul of persistent famine. Contemporary observers have blamed the vagaries of climate, regional conflict, and government agrarian policy for the crisis in food production. Recent evidence, however, has pointed out that the poor performance of the Ethiopia's agricultural sector did not begin in 1974 but was evident in the 1950s.¹ This paper extends that thesis by pushing the dates even further back and examining the historical evidence of causes of that decline visible in the historical record of the twentieth century.

In the end, I wish to raise the question of whether historical indicators support the case for a twentieth-century agrarian cycle. Can we discern from available evidence a process of growth followed by a pattern of agricultural decline which has contributed to rather than resulted from the contemporary crisis in political economy?

Highland Ethiopia's agricultural circumstances are not unique in the contemporary world or in history. Its rural sector resembles, then as now, the basic model of a "preindustrial society characterized by slow technical change where processes of growth are still dominated by the play between demographic expansion and limited resources," a description as applicable to highland Ethiopia in the 1970s or 1920s as to sixteenth-century southern France.²

An agrarian cycle represents growth and decline within equations of productivity, returns to labor, and production per unit of land. For highland Ethiopia in the early to mid-twentieth century the relative roles of population and productivity in regional and local economies have resembled what Emmanuel Leroi Ladurie has called the "Malthusian scissors," which opened as population expanded into an abundant resource of land and capital, but which have begun to close in many regions as per capita productivity stagnates. Both

* I wish to thank Desalegn Rahmato, Allan Hoben, Tekalign Wolde Mariam, Michael Glantz, and participants in the workshop "Agrarian Transformation in Northeast Africa" at Boston University for comments on earlier drafts of this paper.

¹ For arguments and data on the decline of agricultural productivity in the 1950s see Warren Robinson and Famika Yamazaki, "Agriculture, Population, and Economic Planning," *Journal of Developing Areas*, 20 (1986), 385; for the 1960s see Dessalegn Rahmato, "The Peasants and the Comrades: Problems and Prospects of Socialist Transition in Rural Ethiopia," paper presented to the African Studies Association, Denver, Colorado, November 1987.

² Emmanuel Leroi Ladurie, *The Peasants of Languedoc* (Urbana, 1976), 296.

phases are visible in Ethiopia's twentieth-century record; in the past two decades, however, the latter stages have been dominant. The result has been a cycle of progressive squeezing of productive capacity of the agrarian economy in a north-to-south and east-to-west pattern. Though a modern political economy has emerged at Ethiopia's center, the traditional peasant economy of the northern and central highlands has not significantly altered the fundamental limits on its productive capacity. On the contrary, key factors governing productivity of both land and labor have gone into decline at the same time that peasant "entitlements" to the benefits of growth elsewhere in the Ethiopian economy--most notably in the south and west--have failed to materialize.³

The decline of agricultural productivity over the last few generations has not been a uniform process; it has proceeded in fits and starts, with serious decline in some areas and rapid, if short-lived, advance in others. This paper traces over time particular features of the agrarian economy which have had direct effects on agricultural productivity, including demography, climate, technology, cropping systems, property systems, and the political domain (warfare, agrarian administration, and fiscal policy). I have drawn on historical and technical documentation as well as fieldwork within several areas of the northern and central highlands historically dependant on smallholder farms.⁴

Demography: New Equations of People and Land

The historical distribution, density, and growth/decline patterns of the rural population have had a major effect on agricultural production in highland Ethiopia. Demography, in fact, provides the foundation of the argument for a twentieth-century agrarian cycle. Indeed, the rates of growth/decline in population historically accounts for a great deal of the regional and temporal variation in forms of agriculture, uses of labor, and land tenure arrangements. In a number of areas a relatively low density of population to land and resources allowed economic expansion while in other areas population pressure suppressed both gross product and per capita production.

The historical evidence of demographic variation across the highlands and across time is primarily qualitative in nature. Available indicators of demography are strong correlations between population density and forms of agricultural activity such as forms of labor, land distribution methods, and household landholding estimates. These features reveal themselves in oral evidence, in extant survey statistics, and in published observations by travelers and officials. Moreover, we do not have a comprehensive data set or historical studies for all regions. Nonetheless, the evidence available suggests strongly that while population has not been distributed evenly, there has been a broader logarithmic progression of population growth through the present century.

³ Amartya Sen argues that the concept of entitlements accounts for the uneven distribution of famine within a regional and national economy. See Amartya Sen, *Poverty and Famine: An Essay in Entitlements and Deprivation* (Oxford, 1981).

⁴ My analysis here is restricted largely to the areas of highland cereal production, those areas hardest hit by famine. My field experience and research includes Wallo, Gondar, Gojjam, northeastern Shawa, and the Wubera and Babile regions of Hararge.

At the opening of the twentieth century the population of many regions of the northern highlands appears to have begun a period of recovery after the major famine/epidemic of 1889-1892. The recovery probably proceeded slowly, stumbling during regional droughts or epidemics, and certainly slowing or halting during the 1917-1919 influenza pandemic. Italian censuses from Eritrea suggest strongly that growth of highland populations continued even through faltering aggregate food production and localized agricultural crises.⁵

Table 1
POPULATION GROWTH IN ERITREA

Year	Population
1905	274,944
1911	333,431
1917	367,239
1921	407,377
1927	519,175
1931	596,013
1939	614,353

Source: *Istituto Agricolo Coloniale, L'Economia Eritrea*, 43-44, cited in Tekeste Negash, *Italian Colonialism in Eritrea* (Uppsala, 1987), 149.

The average annual rate of growth for Eritrea was therefore 2.9 percent, close to the natural rate in the 1980s.⁶

From other evidence the pattern of general growth across the highlands through the 1920s and into the post-war years emerges from the available sources with population growth, migration, and declining productivity being closely linked. The best hard evidence of this process is comparative aerial photographic data for the period 1955-1975 from the Simen region. In the surveyed area highland population rose by an annual rate of 2.4 percent in the most populous and productive elevations (barely below the natural 2.5 percent increase), but rose 3.58 percent in the lower elevations. Since 1964 the upper limit of cultivation in the Simen region has climbed 100 meters to just below the frost line limit.⁷ This evidence from a region which historically and ecologically resembles areas of Western Tigray, western Wallo, and parts of Gojjam suggests

⁵ The decline of food production from 1921 through 1931. See Tomaso Silliani, *L'Africa Orientale Italiana (Eritrea e Somalia)* (Rome, 1933). On the relative gain of highland population versus pastoralists, see Tekeste Negash, *Italian Colonialism in Eritrea, 1882-1941: Policies, Praxis, and Impact* (Uppsala, 1987), 150.

⁶ This rate is my calculation based on the Italian censuses. The 2.5 percent rate is cited from Ethiopia's Central Statistical Office.

⁷ B. Messerli and K. Aerni, eds., *Simen Mountains, Ethiopia. Volume 1: Cartography and Its Application for Geographical and Ecological Problems* (Bern, 1978), 34. Also note that movement up is clear in the highland Debre Berhan area where frost and waterlogging are primary constraints on keremt cultivation rather than drought. Gryseels and Anderson, *Research*, 9.

strongly that localized migration and the expansion of cultivation is a product of population growth. This pattern verifies statistically the much wider trend of immigration to less productive and more risky lowland cultivation evident earlier along the eastern escarpment. Below the Addis Ababa to Asmara road (the former caravan route) areas like Qobbo in Wallo or Denki in northern Shawa, lowland zones which had been primarily pastoral wet season grazing have been cultivated in the past one or two generations by migrant highlanders.

The story of the lowland regions east of the old Shawan capital of Ankober, reveals a local pattern of regional population dynamics which has emerged in the past two generations. The lowland zone of Denki between 1500 and 1200 meters is now inhabited by mixed Amhara Christian and Muslim Argobba farmer/weavers who have been hit hard by drought since 1972. The Ankober region as a whole has received a steady influx of Amhara settlers since the mid-nineteenth century.⁸ Their general patterns of ambilineal descent and partible inheritance have changed in response to the threat of fragmentation. Prior to 1974, elder siblings were able to "buy off" the claims of younger family members in order to retain viability of holdings. Life histories of present inhabitants reveal a consistent movement into these lowland areas by highland Christian farmers who were the younger, dispossessed children of households located in highlands to the west. New migrants arrived first as tenants using *magazo* (sharecropping) agreements with local Muslim landholders and have continued to arrive since the 1975 land reform to claim the diminishing stock of open land. Household holdings in these lowland areas average 2-2.5 hectares, substantially above current adjacent highland area averages of 1-1.5 hectares. Peasant associations in those highland areas have reached critical land/population ratios and social property institutions have adjusted by barring land claims by new residents.

The Denki experience has wider application since the district resembles an ecological belt below the eastern escarpment which has low agricultural potential--drought-prone, limited dry season pasture, and homoeopathic disease problems--rather than soil infertility. The effect on agricultural productivity in this lowland zone has been less the result of land shortage than problems of climate variability inherent in lowland zones where drought, particularly in the important belg season, plays such a critical role for marginal farms. Beyond the loss of crops, the greatest effect of drought has been to deplete the supply of oxen, which have died more from the lack of forage than the lack of water. Overall, the increase of population in such areas through in-migration and a natural population growth has substantially increased the proportion of the highland population susceptible to climate variation.

In another case, the highland Tegulet district of northern Shawa to the west of the escarpment closely resembles the progression of population growth evident in the Simen study. In that district population pressure has built steadily since at least the post-war period, but probably for much longer. In Tegulet the specter of drought has not been a regular part of the rural experience. Under the pressure of population growth, however, pasture has virtually disappeared and land holdings are uniformly less than two hectares. Even the river flood plains

⁸ Svein Ege, "Chiefs and Peasants: The Socio-political Structure of the Kingdom of Shawa about 1840" (M.A. thesis, University of Bergen, 1978), 60-63.

1000 meters below the plateau have been cultivated. The overall effects of such pressure on per capita productivity are evident. Farmers plow with cows because of the shortage of livestock and pasture; landlords before 1974 hoarded small hay-producing plots as a source of income and leverage over their fodder-poor tenants. The age of first marriage has increased dramatically since there is no land to allocate to new households. Pressures to migrate to lower areas are evident but lowland regions down into precipitous river gorges have already been occupied. Indeed the greatest effects of recent agricultural droughts have been felt there rather than in the long-occupied highlands, though both areas suffer from the reduction of fallowing and crop rotation (see below).⁹

The population crisis building over the course of this century is not restricted to the Amhara/Tigrayan highlands. In the Wubera region of Hararge household land holdings average less than 1/2 hectare and pasturage has all but disappeared. There the rural economy depends on the sale of chat, the narcotic cash crop, to offset the subsistence food deficit; the average household can only produce about 600 kg of grain in the best years, a nine- to ten-month supply. Yet, per capita chat income has declined dramatically as existing trees are divided as property among male descendants. Other signs of population pressure are clearly marked. The oldest inhabitants recall a heavily forested land and substantial pasture which within living memory supported an agro-pastoral economy based on subsistence crops--maize and sorghum--and a diet of milk and gunfo (a cereal/milk paste). Cash income from chat (and coffee in other areas of Hararge) and the consequent relatively heavy involvement in a regional cash market economy has buffered the effects of the demographic explosion, though the basic constriction of resources available to household production units in traction, forage, and productive land has created a dependence on international food donations in the past three years.

The historical relationship between population growth, migration, and economic decline appears graphically in the gradual movement of Tigray's rural population from north to south and out of agriculture since at least the middle of the nineteenth century. Drought and political instability probably accelerated this process, though I believe it was fundamentally based in the limits of ecology and small farm economics. By the early 1880s Tigrinya-speaking migrants from Hamasen had already arrived in the Wag region of Wallo and settled there as farmers.¹⁰ From at least that period, Tigrinya speakers had penetrated into northern Wallo as farmers, but even more prominently as part of a mercantile migration which penetrated south along the caravan route to Shawa. As small market towns emerged between Koram and Dese to manage the regional trade in hides, salt, and grain, Tigrinya-speaking small merchants and entrepreneurs played a prominent part. Many of these had moved to full-time commerce after a beginning in petty agricultural trade. The presence of northerners as part of the conquest and occupation of the south reflects Ethiopia's modern political

⁹ ILCA baseline surveys of Ada and Debre Berhan areas report the trend toward reduction of fallow and pasturage. For a discussion of the needs for intensification see James McCann, Unpublished Report to Oxfam U.K. on Evaluation of Hararge Projects, 1987, and James McCann, Unpublished Report on Evaluation of Ox/Seed Project, Oxfam America, 1986.

¹⁰ See Sven Rubenson, *The Survival of Ethiopian Independence* (London, 1976), 378, and McCann, *Poverty to Famine*, 187.

economy but also the strong "push" out of the northern rural economy.¹¹ Thus the farming population from some of the more densely settled portions of the highlands had already begun a movement physically away from their agricultural bases and incorporated trade as a primary economic base.

It is far more difficult to find data to determine exactly the origins of agricultural stagnation or to discern periods of recovery amid general decline than to identify the overall phenomenon. Nevertheless, by 1926 Talamonti, the Italian resident at Maqale, argued to his superiors in Asmara that Tigray and the north were in a "virtual famine condition," despite the lack of major ecological catastrophes in that period.¹² Such evidence as exists suggests strongly that the decline of the agricultural economy progressed in a basic north-south direction, affecting eastern zones more fully than the west. Eritrea's consistent demand for grain from Sudan and northwest Bagemder is another good indicator of the decline of that area's agricultural base. Italian development schemes which required wage labor had to look outside to colony for surplus grain to feed them since Eritrean food production declined steadily through the 1920s.¹³ Eritrea and Tigray experienced the decline earlier than Wallo, and Gojjam has yet to feel the full effects.¹⁴

The slow transformation of local economies provides additional evidence. The presence of an active market in grain, salt, and imported manufactured goods has played a far more substantial part in the rural household economies of Tigray and Eritrea than for points further south where pressure on the agricultural economy was felt much later. The income from local-level trade, especially in the eastern regions of Tigray and Eritrea sustained those economies past the viability of agriculture. By the late 1960s Dan Bauer found that households regularly engaged in petty trade as a strategy for supplementing income.¹⁵ Indeed, the most significant difference between the economies of the Wag (adjacent to Tigray) and Lasta districts of northern Wallo was the greater dependence of the former on off-farm trade income and the northbound grain market.¹⁶

¹¹ For greater detail on push factors see James McCann, "Households, Peasants, and the Push Factor in Northern Ethiopian History," *Review* (1986).

¹² Talamonti to Addis Ababa, *Archivio Storico delle Ministero Africana Italiana* 37/6 and 54/36, 8 August 1926.

¹³ The annual trade statistics and politics of the dura trade appear in annual reports from the Central Economics Board located in the Sudan Library, University of Khartoum. Eritrean food production figures are available in Sillani, *L'Africa Orientale Italiana*.

¹⁴ Volker Stitz, "Distribution and Foundation of Churches in Ethiopia," *Journal of Ethiopian Studies*, 13, 1: 17. From this work it is clear that there is a strong correlation—at least in traditional Christian areas—between length of settlement and population densities. The areas of highest church and population density are in Tigray, northern Shawa, and northern Wallo. Gojjam was settled by Christian highlanders only in the sixteenth century. See Tadesse Tamrat, *Church and State in Ethiopia* (Oxford, 1972),

¹⁵ See, for example, Dan F. Bauer, "Land, Leadership, and Legitimacy among the Inderta Tigre of Ethiopia" (Ph.D. dissertation, University of Rochester, 1972), 15.

¹⁶ This characterization was made in both historical and contemporary terms in interviews of residents of northern Wallo. See McCann, *Poverty to Famine*, 188. Saqota, for example, was a far more active market center for middle-distance trade than was Lalibela.

Population growth in and of itself would not necessarily have a negative effect on productivity, except that the prevailing relations of property, technology, and historical response to such pressure have led to migration and expansion to new land rather than a general intensification of labor with the application of technology and cropping systems. The sections below analyze the apparent absence of those processes of adaptation.

Climate: The Rhythm of the Seasons

The historical role of Ethiopia's climate has been an enigma, largely because of the lack of hard historical data and the failure of climatologists and social scientists to cooperate in understanding the relationship between climate and human action. Most of the historical studies of climate have therefore focused on the record of famine and/or drought as recorded in royal chronicles, church documents, or the accounts of foreign travellers.¹⁷ Nevertheless, such records are spotty and impressionistic, and tend to feed the myth of a famine cycle in Ethiopia. The point here is that climate as a feature of ecology, as William Cronon has noted, is not a constant but historical and dialectic.¹⁸

The basic features of Ethiopia's climate are well known. The agricultural cycle of labor, social reproduction, and resource allocation on the northern highlands reflects primarily the regime of rainfall.¹⁹ In most northern highland areas rainfall is bimodally distributed, creating three seasons: keremt (a summer rainy season late June to September), belg (small rains from March to early May), and bega (the dry harvest season October through February). Except in areas above 2800 meters where summer frosts are a problem, the main growing season falls in the summer with a crop planted in late June or July and harvested in December and January. Belg rains also allow for a smaller, but often significant crop harvested just prior to summer planting.

The rainfall calendar for the northern highlands thus follows a clear pattern, within which variation is a significant feature. In January and February, harvest months, rainfall is minimal; sun-baked, heavy soil and limited forage mean there is little post-harvest plowing. In March and April the mean level of rainfall increases, but with a significant degree of year-to-year variation in the total amount and consistency over these two months. In May and June the amount continues to increase with great variation in reliability by region. By late June and early July (in some regions on Saint Mikael's day) the main rains

¹⁷ For treatments of history and drought see Bahru Zewde, "A Historical Outline of Famine in Ethiopia," in Abdul Mejid Hussein, ed., *Rehab: Drought and Famine in Ethiopia* (London, 1976), and Ethiopian Delegation, "Climate and Drought Conditions in Ethiopia," and Workineh Degefu, "Some Aspects of Meteorological Drought in Ethiopia," in Glantz, *Drought and Hunger*. A more substantial study of the social effects of drought, in this case the 1889-92 famine, is Richard Pankhurst, "The Great Ethiopian Famine of 1888-92: A New Assessment" *Journal of the History of Medicine and Allied Sciences*, 21 (1966), 95-124, 271-294.

¹⁸ William Cronon, *Changes in the Land: Indians, Colonists, and the Ecology of New England* (New York, 1983), 13-14.

¹⁹ Workineh Degefu, "Some Aspects of Meteorological Drought in Ethiopia," in Michael Glantz, ed., *Drought and Hunger in Africa: Denying Famine a Future* (Cambridge, 1987), 27, indicates that for highland agriculture rainfall and moisture availability is the key "limiting factor."

begin and continue through September. Variability steadily decreases into July and August. The dates of seasonal transition--i.e. the onset and end of the two rainy seasons--constitute the most agriculturally significant variable.

The patterns conform to more general observations that variability is strongly correlated with rainfall amount and elevation.²⁰ Thus lowland areas below 2000 meters experience the most significant variability. The reliability of belg rains in particular varies considerably across the highlands. For the Combolcha area in the important Wallo region the rains are relatively reliable in April (beginning of the belg rains) but highly unreliable for the crucial months of May and June, which are key growing months for belg crops; in comparison the main rains are fairly reliable. By contrast, in Ada, the productive agricultural zone south of Addis Ababa, the major month of variability is May, the key month of June being significantly more reliable, with important implications for start-up activities for the major crop cycle. Debra Marqos in the drought-resistant Gojjam region shows a consistent decline in variability throughout belg leading directly into the main rains. The Gondar area, 100 kilometers north of the prosperous Lake Tana region shows similar tendencies. In all cases variability increases dramatically in October and through the January/February period when rainfall amounts decrease though variation there is not agriculturally significant.²¹

The effects of seasonality on the annual rhythm and resource management--distribution of labor, capital needs, and livestock management--on peasant farms are significant. Since the patterns of variability revealed here have contributed to quite different characteristics of the seasons, especially the critical dimension of inter-annual variation, I would argue that it is to this pattern of climate--rainfall being the key "limiting factor" to agriculture in the highlands--that the agricultural system and its social corollaries have responded over time.²²

In fact, climate's interaction with human activity is the key issue, not climate in isolation.²³ While meteorological droughts have been a fact of climate history across Ethiopia in the twentieth century they are not the norm, nor are they always agriculturally significant. Far more critical have been the patterns of interannual variation in the beginning and end of the seasons, uncertainties

²⁰ Ethiopian Delegation, "Climatic and Drought Conditions in Ethiopia," Paper Prepared for the Scientific Roundtable on the Climatic Situation in Africa, Addis Ababa, February 1984, 4. The climatic phenomenon of the coincidence of high variability and low rainfall levels is also mentioned by R.P.D. Walsh, "The Nature of Climatic Seasonality," in Robert Chambers, Richard Longhurst, and Arnold Pacey, eds., *Seasonal Dimensions to Rural Poverty* (London, 1981), 16, 21, who notes also that patterns of seasonality change over time has generally meant greater variation in the beginning and end of rainy seasons.

²¹ Calculations of interannual variation of rainfall and seasonal variation in four highland areas are available in James C. McCann, "Climate and Class in Ethiopia: The Seasons and the Historical Development of Agricultural Stratification," Paper presented to the African Studies Association, Denver, November 1987. The key statistical measure of variability is the coefficient of variability, the standard deviation divided by the mean.

²² The index of "seasonality" developed by Chambers et. al is the sum of the absolute deviations of *mean* [my emphasis] monthly rainfall from the overall mean divided by the mean annual rainfall. See Walsh, "Climatic Seasonality," 13-15.

²³ Michael Glantz makes a clear distinction between agricultural drought and meteorological drought. See Glantz, "Drought and Economic Development in Africa," in Glantz, ed., *Drought and Hunger*, 47-48.

for which farmers have had to plan. Moreover, the effects of climate variation from month to month and year to year have had a far more serious impact as per capita resources such as land and livestock have declined relative to population. Thus climate plays a part in an agricultural cycle primarily in its interaction with human activities not as an independent variable.

The effects of interannual variation on agricultural change in the highlands can be seen in the impact of the spring rains. Spring rains in many areas have come to play a critical role in the economic cycle. Though they account, on average, for only 5-15 percent of the total annual crop, they provide a critical margin of productivity on smaller, resource poor farms which lack both capital and credit in providing food for the hungry season before the main December/January harvest. Beyond the harvest they provide, spring rains allow for more effective and timely seedbed preparation, and regeneration of livestock resources by improving pasture. Resource poor farmers faced a classic dilemma of whether to plant belg crops or to allow those fields to regenerate as pasture to sustain livestock into the main plowing season.²⁴

When belg rains fail poor farmers must borrow new seed, obtain food, and pay higher costs for obtaining oxen in preparation for the main rains. Climate statistics show quite clearly that belg rains fail more often than the main rains in all highland zones. In the Debre Berhan area, for example, only one in three belg seasons has sufficient rains for a crop, yet declining supplies of land have forced cultivation on frost-prone areas where only belg crops are possible.²⁵ As overall resources of land and capital decline with population growth (see below), the lack of reliable spring rains has had an increasing impact on agricultural production, helping to produce a new class of poor, indebted farms. In many highland areas reliance on belg rains for food and capital maintenance are a distinctive feature of the twentieth century, or, more fundamentally, the mature stage of an agrarian cycle.

This phenomenon is not so much the product of drought per se but of climate interaction with social and economic change on the agrarian scene. Agricultural droughts when they have come are not necessarily the cause of economic decline but they exacerbate the weakness of farm economies. Recent work on famine victims suggests that the class of capital poor farmers lacking stored food, credit, and key productive resources have been hardest hit by droughts when they have come. In fact, climate's effects vary depending on the maturity of the agrarian cycle itself, i.e. the density of settlement, use of marginal lands, and distribution of capital resources.

Technology: The Tools and Techniques of Production

The basis for highland agricultural technology is the equipment, cultigens, and agronomic techniques of the highland's distinctive dryland farming system. The single-tine scratch plow, a pair of oxen, an array of leather, wooden and iron

²⁴ Dessalegn Rahmato has told me that some farmers in Wallo have begun to avoid belg planting in favor of supporting their livestock. For most others in my experience belg crops were far more critical to food and seed supplies.

²⁵ Gryseels and F. Anderson, *Research on Farm and Livestock Productivity in the Ethiopian Highlands: Initial Results 1977-80* (Addis Ababa, 1983), 9-10. For data on belg variability see note above.

processing tools, and a metal plow tip have served as the capital equipment of the rural farming household. This basic form has been stable in most areas for over a millennium; in southern areas such as Hararge, it has been in place for almost a century. The work of Joseph Michels and Frederick Simoons suggests strongly that the plow has been part of the northern highland farming system since pre-Axumite days.²⁶ The plow came later to areas in the south and west incorporated under the aegis of Menilek's state, yet the adoption probably had less to do with Amhara stewardship of the rural economy than it did the longer-term spontaneous process of sedentarization of Cushitic pastoralists.²⁷ In most areas the plow has been supplemented by an array of locally inspired tools--hoes, spades, or digging sticks--used by work groups, oxenless farmers, or by women for homestead gardens.²⁸

Remarkably, there has been very little innovation in design, materials, or application evident in this farm equipment, nor in technologies of application (irrigation, mechanization, incorporation of new forms such as viticulture). Donald Crummey's survey of nineteenth-century crops and technologies suggests considerable stability in crop varieties.²⁹ Imported steel plowshares replaced local wooden or iron tips in the early twentieth century, but this was more a change in durability than concept. Surprisingly, the shift to mouldboard steel plows, harrows, or seeding apparati which took place in Europe at critical points of productivity take-off has not taken place in Ethiopia even in very recent years. Even where agronomic techniques have adapted to local conditions, such as the use of broadbeds to avoid waterlogging or terracing to increase usable land, farmers have not adopted new tools for the task. Despite occasional observations of the use of horses, donkeys, camels, or cows, oxen have remained entrenched as the traction animal of choice. Indeed, the economics of smallholder farms and risk aversion strategies have produced fairly consistent resistance to such change and even abandonment of such techniques as terracing and irrigation employed in the past, or in other locations.³⁰

²⁶ This evidence on the persistence of highland dryland plow agriculture comes from recent interpretations of Axum data. See Joseph Michels, *The Axumite Kingdom: A Settlement Archaeology Perspective*, paper presented to the Ninth International Conference on Ethiopian Studies, Moscow, August 1986. An earlier treatment of the presence of the plow in highland agriculture is Frederick Simoons, "Some Questions on the Economic Prehistory of Ethiopia," in J.D. Fage and Roland Oliver, eds., *Papers in African Prehistory* (Cambridge, 1970), 124-129.

²⁷ This information derives from interviews held on 4 July 1987 with Bakar Daud (age c. 100) and Yusef Chela (age 75) at Lelissa Peasant Association, Wubera, Hararge. Muhammad Hassan argues that agriculture in the Wubera region diffused from the vicinity of Harar town. See Muhammad Hassan, "The Relationship between Harar and Its Surrounding Oromo between 1800-1887" (B.A. thesis, Haile Sellassie I University, 1973).

²⁸ These hand tools vary by area: the *doma* in Amharic is a short hand hoe similar to the *akafa* for Oromo; in Hararge fallow land is broken with the *dongora*, a stone-weighted digging stick.

²⁹ Crummey, "Ethiopian Plow Agriculture in the Nineteenth Century," *Journal of Ethiopian Studies*, 16 (1983), 1-24.

³⁰ Recent International Livestock Centre for Africa variations on the ox plow technology, such as seeding attachments, single-ox plows, or broadbed makers, have shown promise but not much spontaneous adoption to date. See Guido Gryseels and Samuel Jutzi, *Regenerating Farming Systems after Drought: ILCA's Ox/Seed Project, 1985 Results* (Addis Ababa, 1986).

The mechanization of smallholder agriculture, even in the most developed agricultural zones, has been marginal. The reasons for this lack of capital intensification are fairly obvious. First, the basic labor surplus which characterizes the highland rural economy means that the opportunity cost of labor during key periods when farm operations need mechanization (during spring plowing and harvest/threshing) is close to zero.³¹ Oxen are indeed a scarce resource, but those farmers without animal traction are also those least able to employ mechanization. Second, credit within the traditional rural economy is scarce and prohibitively expensive for the vast majority of farmers, even for small-scale additions of equipment. The usurious annual rate of 120 percent has been traditional across the highlands through most of this century.³² Though some wealthy elite may have been able to afford investing in new forms of technology, the historical dominance of tenancy rather than the development of plantations or other forms of direct elite involvement in agriculture discouraged innovation on the part of both farmer and elite.³³

The reasons for technological conservatism are open to debate. The historian Merid Wolde Aregay has placed the burden of technological stagnation firmly on the social system inherent in peasant land tenure and the insecurity of income rights of elite in the agrarian political economy. Merid Wolde Aregay has argued strongly that the rist system of land tenure and partible property rights together with elite control of income rights (gult) combined to stultify technological initiative:

The gult system made sure that emperors, noblemen, warlords, soldiers as well as monks knew the names and domiciles of their gabbars [farmer/taxpayers]. There was no need for them to know the land and inquire into the technology of agriculture. The peasant on the other hand, was completely aware of the factors which affected agricultural activities. He knew the quality of his soil and what soils were more receptive to what grains. He understood at which levels of the highland each type and strain of his grains thrived best. Travellers, from F. Alvarez down to H. Salt, saw how carefully he could irrigate his lands as well as tend and grow fruit trees of all kinds... The low level of life of the Ethiopian peasantry and of the ruling classes cannot, therefore, be attributed to primitive

³¹ There is often a demand for labor at harvest. See Gene Ellis, "Man or Machine, Beast or Burden: A Case Study of the Economics of Agricultural Mechanization in Ada District, Ethiopia" (Ph.D. dissertation, University of Tennessee, 1972), 41. For a dissenting view on mechanization see Dessaegn Rahmato, "Moral Crusaders and Incipient Capitalism," *Proceedings of the Third Annual Seminar of the Department of History* (Addis Ababa, 1986), 71-72.

³² See V. Grottanelli, "Ricerca geografica ed economica sulle popolazioni," *Missione de Studio al Lago Tana*, II (Rome, 1939), 147-48; also see James C. McCann, "Households, Peasants, and Rural History in Lasta, Northern Ethiopia 1900-35" (Ph.D. dissertation, Michigan State University, 1984), 93 and note 55; Dan Bauer, "Land, Leadership, and Legitimacy among the Inderta Tigray of Ethiopia" (Ph.D. dissertation, University of Rochester, 1972), 131.

³³ Gene Ellis's work on Ada (40 kilometers south of Addis Ababa) in the early 1970s has pointed out the uneconomic nature of mechanized agriculture even in the most developed, market-oriented highland farming systems. Land fragmentation, the low opportunity cost of labor, and problems of maintenance rendered tractors highly uneconomic. More important, the yields from mechanized plots was not significantly higher than those using ox-plow methods. Ellis argues that tractors have appeared only as a result of the economics of government subsidies for credit and fertilizer to landlords. See Ellis "Man or Machine," but also Dessaegn, "Moral Crusaders."

technology. The rest form of tenure and the endless segmentation of farms that it entailed deprived the peasant of the will to work and to seek improvement. It made him quarrelsome while at the same time shutting and fixing him within the confines of his ancestral village. . . .³⁴

This perspective effectively points out the relationship between technological innovation and social processes but also idealizes the active, knowledgeable farmer outside of the factors which, in fact, make him/her a peasant. As Merid suggests, examples of new forms of technology abound, but systematic application has been profoundly isolated. Indeed the fragmentation of political authority which characterizes highland political culture has inhibited the cooperation necessary to sustain irrigation, especially in the face of demands on upstream resources resulting from population growth.³⁵ In fact, some of the most visible forms of innovation have come in the adaptation of labor and land distribution in areas of low population density rather than technological change under population pressure, quite the opposite of a tradition of agricultural intensification. Crises in climate and food resources, far from stimulating innovation, appear to have driven smallholders further into conservative risk aversion strategies.

The slow pace of technological change in agricultural technology in Ethiopia is not merely the result of poverty, state neglect, or an innate sense of conservatism among farmers. The social and economic complexity of local farming systems, the weak market orientation, lack of credit, and economies of scale have restricted technological change. The complexity of explaining why technological innovation has not taken place notwithstanding, the impasse of technology amid crises of diminished resources in land and capital described below has placed a severe limit on the agricultural economy's ability to raise productivity. The traditional equations of land/labor/demographics have operated within specific technological boundaries. The failure to alter those limits over time has defined productivity within local and regional agrarian cycles of growth and decline.

³⁴ See Merid Wolde Aregay, "Land Tenure and Agricultural Productivity, 1500-1850," *Proceedings of the Third Annual Seminar of the Department of History*, 115-130.

³⁵ I have observed this phenomenon in the Ankober lowlands where locally innovated irrigation has virtually ceased because of new upstream water demands. I am grateful to my colleague Dessalegn Rahmato for pointing this general effect out from his own work in Wallo.

Social and Property Relations

The relationship between population, agricultural productivity, and the adaptation of social institutions has been a major factor of consistency in the period. Among the most salient historical evidence on social adaptation of the farming/social system of the highlands is the expansion of the system and its cropping/technology spackage itself. The cultivation of cereals using the highland plow has been expanding from its northern core for several centuries. With it has traveled a distinctive set of property rights which includes ambilineal descent and partible property, and an expansionist political culture. The military ability of the imperial state and local equivalents to expand its own tributary hegemony underwrote the natural flow of population to the frontiers of culture and cultivation.

The expansion of the soldier/farmer to new lands was a prerequisite for establishing imperial control. The first expansion took place to areas of ideal climate and elevation on the southern perimeter of Amhara/Tigrayan settlement, a frontier which has advanced considerably to the south and west since Axum. The settlement of soldier/farmers and establishment of churches to serve them created a context for the expansion of the farming system. The steady move of imperial capitals south since Axumite times was at least partially an indication of a series of progressive shifts to areas of less intensive cultivation and higher productivity.

The agrarian production regime has been as important an element for the assimilation of Cushitic populations on the periphery as has the military power of the state. Agaw speakers of Gojjam, Lasta and Simen have adapted wholesale the highland farming system while retaining their language. In Hararge, by contrast, the Oberra Oromo of Wubera managed to accept plow agriculture in the late-nineteenth century with their own mix of crops and without relinquishing Islam or their own property/inheritance/marriage systems.³⁶

More recently in the post-war period the expansion of the highland farming system has taken place into low potential zones where conditions for highland crops and livestock use patterns have had to adapt. In the east, the movement to cultivate lowland areas below the escarpment has been a general trend from Eritrea south to northern Shawa. The evidence for this shift includes observations of spontaneous migration to new cultivation in Wallo, near Qobbo and Koram and in Sirinka, in Shawa, below Ankober, and in Tigray. In the west there has been considerable seasonal and permanent movement to Setit-Humera.³⁷ These areas have traditionally served as wet season pasture for

³⁶ See note 13 above. Informants from Wubera claim that the plow predated the Amhara presence in the late nineteenth century but that short season crops arrived with the Amhara in 1887.

³⁷ For Qobbo see Assefa Bekele, Yitateku Negge, and Tewolde Gebre Egziabher, "Zobel: An Experiment in Relief and Rehabilitation," unpublished mimeograph, Relief and Rehabilitation Commission, 1974; for Sirinka see Noel Coussins, "The Day of the Poor Man," unpublished mimeograph, Drought Relief and Rehabilitation Commission, 1975.

lowland pastoralists and have been sites of conflict.³⁸ The much higher risk of drought and variability of rains, especially spring rains, has imposed a slightly different set of crops and social adaptations.

The imperative to expand is explained as much by the needs of the farming system as it is by the military tradition. The historical ability to do so has fairly consistently obviated the need to intensify labor or adopt new technology. Ironically, as land resources have diminished relative to population in areas of long-time settlement, it has been capital resources as much or more than land which have become scarce factors. Consequently, social institutions for the distribution of labor and capital have become increasingly important over time. In both Lasta of the 1920s and northern Shawa in the 1980s local institutions for the borrowing and transfer of oxen and seed have been key to establishing patterns of debt and dependency locally. Capital resources are, after all, those which are first to disappear during climatic or economic crises. The social institutions which link wealthy farmers to poor ones through accumulated debt have endured in form and function right through the twentieth century, though their effect is most graphic in areas of increasing population density and vulnerability to climate variation.

The evidence of social adaptation to new ratios of population to resources from the northern highlands is scattered but reasonably convincing. Allan and Susan Hoben who worked in Manz district of northern Shawa in the mid-1960s were able to observe the latter stages of the repopulation of an area thinned during the Italian occupation. The population which had abandoned the land between 1936 and 1941 had slowly returned to improved ratios of livestock to population and relative prosperity, approximating the historical advantages of movement to new zones.³⁹ Dan Bauer's evidence from eastern Tigray has shown how population pressure transformed land distribution from open-ended residence-based claims to a more restrictive rist-based system as density increased.⁴⁰ The labor shortage relative to land which encouraged the use of slave villages and sharecropping villages in Walqayt also involved flexibility in social/economic response.

The effect of the agrarian reforms since 1974 has been to increase the effects of demographic pressure rather than reducing them. This pattern of increasing exclusion with in-migration and natural population increase is event more recently in the rules of peasant associations in northern Shawa. The land reform in these areas brought a higher demand for land allocations with the shift from a descent-based allocation system to a residence-based one. Evidence on land redivision is not available nationally, but plot size and overall landholding area in four areas I have worked appear to have decreased precipitously in the

³⁸ The outbreak of raiding and conflict in the lowlands of eastern Tigray and Wallo from 1928 to 1930 and which culminated in the Ras Gugsa rebellion may have been the result of conflict between new settlers and pastoralists. For an account of these events see McCann, *Poverty to Famine*, 146-168.

³⁹ Information of Manz repopulation comes from personal communication from Allan and Susan Hoben on their fieldwork in Manz in the early 1970s.

⁴⁰ Bauer, "Land and Legitimacy," 218.

recent past and also resulted in restrictive land acquisition policies for newcomers and newly formed households.⁴¹

Land reform in most areas of the highlands has not affected the patterns of declining productivity. Social institutions for the distribution of capital resources have continued from the 1920s through to the present, though the relative scarcity of key resources such as seed and oxen has likely helped solidify local stratification by increasing indebtedness within the local agrarian economy.

Cropping Systems

From available accounts, highland farming systems have not transformed themselves beyond the technology or the basic cropping systems of the nineteenth century.⁴² The wide variety of cultigens available across the highlands has provided a substantial basis for local adaptation, sometimes to the needs of subsistence and other time in response to market opportunities. In lowland cultivated areas the traditional cereals barley, wheat, and teff had to give way to sorghum and maize which are less marketable but better adapted to short, unpredictable growing seasons. In the past decade, the move to more vulnerable land and the reduction in pasture for livestock has encouraged a dramatic increase in the cultivation of oats over barley and a general decline in barley overall.⁴³ Local and regional shifts in crops like oats or the adoption of sweet potatoes have doubtless percolated through the rural economy as new crops have become available. Maize, a quick maturing crop with low labor requirements, was one example. For the most part new crops added to the existing mix represented minor adjustments to the needs of subsistence rather than major alterations in the basic farming system's allocation of labor or use of tools.

Neither have agronomic systems across the highlands remained either uniform or static. For example, farmers of the vertisol plains in adjacent areas of Shawa and Wallo which have had historical marriage relations and share the language, social institutions and highland farming system differ in their management of their soil's tendency to waterlog. In northern Shawa farmers accept low productivity of their vertisol plots while their compatriots in the more densely settled Warra Ilu area of Wallo invest considerable labor in constructing broadbeds to drain excess water and achieve a significantly higher yield. Farms in bottom lands around Debre Berhan have traditionally planted belg season barley to overcome that land type's tendency toward frost and waterlogging

⁴¹ The most critical variable is population density. While principles of land allocation derive from national policy, actual local practice is flexible in terms of policy toward new applicants and timing of land redivisions.

⁴² For a survey of plow agriculture in the nineteenth century see Crummey, "Ethiopia Plow Agriculture."

⁴³ Though discouraged by the Ministry of Agriculture, oats have become popular because of their resistance to waterlogging and frost as well as providing substantially better fodder for livestock. The statistical evidence for this shift in production/consumption is only now emerging. My evidence comes from Samuel Jutzi of the International Livestock Centre for Africa and Ian Watt of the Department of Geography, Addis Ababa University

during the main rains.⁴⁴ In fact, the pressure to occupy these marginal plots suggests a decline in regional production per capita.

In other areas the period from the beginning of the post-war era until the early 1970s the introduction of active urban markets has transformed small farm market participation. The Ada district around Debre Zeit town had long served as a source for high quality cereals for the urban market and its mixed Oromo and Amhara farms had been designated madbet land to provision Menilek's court and even Addis Ababa's churches. Ada's proximity to the burgeoning Addis Ababa market, its rich soil, and stable climate promoted crop specialization in the post-war period at a level unprecedented in highland agriculture. Between 1960 and 1980 percentage of crops in teff increased from 35 percent to over 50 percent.⁴⁵ The specialization in teff was based on traditional technology and landholding and appears to have been the result of two processes: first, a response to growing urban markets for high quality teff, and second, a demand for rents paid in teff by urban landlords who through purchase or inheritance had acquired Ada land. In many cases teff never reached the market; land owning families stored it for household use and distribution in urban social networks.⁴⁶ Despite the intensity of market involvement, however, the basic organization of production remained rooted in smallholder farms using animal traction, scratch plows, and family labor. Fertilizer and improved seeds were available but only through limited credit schemes.

Despite the evidence of adaptability in some cases, the overall trend on smallholder farms has been one of decline in resources per household and productivity per unit. Even the success story of Ada demonstrates the point well. The relatively high productivity of Ada agriculture in the post-war period attracted external aid agencies and private farming interests in the early 1970s to push the use of fertilizer and improved seeds.⁴⁷ This interest and government credit schemes, in turn, drove land prices up and attracted new tenants and land speculators. Thus, the effect of Ada's success has been negative for per capita production: in 1969 average per household land holdings amounted to 3.5 hectares per holding while by the early 80s it had declined to between 2.0 and 2.5 hectares per holding with only a marginal increase in yield. At the same time the trend in subdivision and fragmentation had decreased both fallow periods and available

⁴⁴ See Oxfam America, *Ethiopia Relief and Development* (1988), 5. Also see Gryseels and Anderson, *Research*, 11-12. It is on such lands that oats are overtaking barley as a high elevation staple.

⁴⁵ See Gryseels and Anderson, *Research*, 12, which shows a consistent drop in wheat and other cereals from 1960 through 1980 and a slight rise in pulses. The latter is attributable to the practice of rotating pulses with teff.

⁴⁶ Assefa Mehretu, former head of the Institute of Development Research in Addis Ababa argues that elite landholding families in Addis Ababa rarely bought teff but brought it from tenant lands to Addis Ababa storehouses and distributed to family from there. Personal communication

⁴⁷ It is important to note that the process of specialization antedated formal development programs and extension in Ada. See Raymond Borton, Mammo Bahte, Almaz Wondimu, John Asfaw, "A Development Program for the Ada District based on a Socio-economic Survey." Stanford Research Institute, 1969: 62-68.

pasturage.⁴⁸ The major shift in cropping to teff reduced the production of other grains, though with slightly increases in pulses which rotated on teff plots.

The historical decline of land resources per capita through the twentieth-century cycle might suggest a need to intensify cultivation across the highlands. Yet the record suggests that intensification of labor has not made major changes in productivity nor transformed farming systems. Rainfed highland agriculture has only a few points at which increased labor will raise yields—plowing and weeding—and demand for ox and human labor in these periods restricts its availability. Moreover, traditional crops have limits on additional labor's capacity to increase yield. Teff yields increase with five rather than four plowings, but not with six; more weeding increases a harvest, but the effect is not unlimited.

Uses of Non-farm Land: Forestry and Pasture

The historical expansion of highland cultivation, though cyclical in terms of productivity, brought with it relatively permanent changes in the land. Pastoral landscapes painted in Tigray by Henry Salt in the early nineteenth century have changed beyond recognition. The political and military ability to expand over time also obviated the need for new technological or agronomic solutions to population density, tying the political system to farming systems and ecological change on the highland landscape. The historical ability of the system to expand has allowed problems of pressure on land, non-farm resources (fuel and forage), and capital to be resolved by out-migration and new cultivation before productivity decline and returns to labor have reached a crisis stage.

In this historical pattern a key indicator of maturity in the demographic cycle has been the loss of non-agricultural land and its products—forest and pasture—which serve in early stages of development as free goods.⁴⁹ The decline of forests and pasture as a resource in highland agriculture is perhaps the most visible indicator of population pressure and productivity decline. The loss of non-farm resources as a product of highland farming systems accounts not only for the local impetus to expand but also the weakness of local economies during historical periods when the military capability of the state was on the wane. Forests and pasture have been an important part of the ecological and social nexus of the highland rural economy.

The historical data on the decline of forest resources is scattered but convincing. Forested area in Ethiopia as a whole has declined from about 40 percent in the early twentieth century to about 4 percent today.⁵⁰ Most of that decline has taken place as a result of land clearing for cultivation and fuel as a direct consequence of the expanding highland agricultural activities. Charles Beke in 1843 noted the sharp contrast between settled eastern Gojjam and the relatively newly settled Damot area to the west; today natural forests are

⁴⁸ Landholding figures come from Borton, et al., "Development Program," 96; and Gryseels and Anderson, *Research*, 11, 32. The trend is decidedly toward annual reductions in household land holdings.

⁴⁹ It is useful to note here that another indicator of the mature stage of the agrarian cycle in the establishment of trees and pasture (or fodder) as property.

⁵⁰ Gryseels and Anderson, *Research*, 10. Even more convincing is data which shows northern provinces account for only 4.1 percent of Ethiopia's forested area but contain 37.2 percent of its cultivated area. See Daniel Gamachu, *Environment and Development in Ethiopia* (Geneva, 1988), 7.

virtually absent in both sections of Gojjam where forested land has declined to .7 percent of total area as cultivated land and population has increased.⁵¹ Carlo Annaratone who travelled south from Koram in 1911 was more interested in politics than agriculture, but he did know the fuel needs of his entourage's nightly encampment. He reported abundant firewood in area along Wallo's eastern escarpment that in the past decade has been devoid of trees but full of cultivators. Today, forested areas account for only .3 percent of Tigray's land.⁵²

The loss of non-cultivated land resources has not been restricted to the northern highlands. In Wubera, Hararge old residents can name a range of primary tree species and point to valleys which were forests in their childhood but are cultivated today. The result of this change has meant a decline of wood fuel, a gradual shift to dung fuel and a consequent increase in women's labor to supply household fuel needs. By 1980 farm households in Ada and in Debre Berhan burned four times more dung by weight than wood.⁵³ Local histories of women's work lives would effectively reveal the pace and significance of this change.

The overall loss of forage/pasturage to cultivation has had a similar, if more direct effect on productivity since it directly affects supplies of capital, i.e. oxen. In areas in increasing population density pasture has steadily declined relative to livestock needs.⁵⁴ The changes in amounts of available pasture in the highlands is evident in Donald Crummey's observation that nineteenth-century travellers reported highland pastoralists in Tigray, Gojjam, Shawa, and the Lake Tana region, areas intensely cultivated today. By contrast, recent oxen per household figures from Simen, northern Shawa, Ada, Gojjam, and highland Hararge all show a fundamental shortage of traction animals. Though we have no conclusive statistical data for the pre-1960 period, recent evidence suggests strongly that the expansion of cultivable land correlates directly with a reduced capacity to support an adequate cattle/oxen population.⁵⁵

The historical link between demographic density and reduction of oxen/livestock holdings is persuasive if not conclusive. The trend has been a gradual one associated with the loss of pasture far more than the short-term

⁵¹ See Charles Beke, "Abyssinia - Being a Continuation of Routes in That Country," *Journal of the Royal Geographic Society*, 14 (1844), 3. For current statistics see Daniel Gamachu, *Environment and Development*, 7.

⁵² Carlo Annaratone, *In Abissinia* (Rome, 1914), 121. See Daniel Gamachu, *Environment and Development*, 7.

⁵³ For a comprehensive study of agroforestry and farming systems see Peter Pochen-Eiche, "The Application of Farming Systems Research to Community Forestry: A Case Study of the Hararge Highlands, Eastern Ethiopia" (Ph.D. dissertation, Albert-Ludwigs University, 1986). In ILCA research (Gryseels and Anderson, *Research*, 10) areas at Debre Berhan and Debre Zeit use of wood fuel now makes up approximately 1/4 of the total fuel source. The need to rebuild this resource is obvious. Yet, efforts to use local labor for afforestation schemes has added a further drain on household labor supplies with returns to the household being unclear.

⁵⁴ Gryseels and Anderson, *Research*, 10.

⁵⁵ My surveys in both northern Shawa and Wubera, Hararge show that the average ox/household holding has fallen below a pair per household. See James McCann, "The Social Impact of Drought in Ethiopia: Some Implications for Rehabilitation," in Glantz, *Drought and Hunger*, 252, which includes data from ILCA and Ministry of Agriculture surveys.

shocks from drought or disease. The Simen longitudinal study describes in detail the process of pasture loss and indicates that by 1975 the average household owned less than a pair of oxen. In Tegulet, Shawa where density has increased steadily during this century, farms in the last few generations have incorporated cows as traction animals because of the shortage of oxen. Even in the high production Ada region average oxen/household declined from 3.21 in 1969 to 1.86 in 1980.⁵⁶ Overall, the evidence on oxen holdings and the decline of pasture strongly suggests both a relative decline in the numbers of animals available per farming household and in most areas an absolute decline in the number of animals supported locally.⁵⁷

Forests and pasture share their vulnerability to expanding cultivation but differ in their potential for regeneration. Open pasture can recover within weeks after a drought or in a season or two as fallowed cropland. Trees, once cleared, have a much longer cycle of recovery and most indigenous primary species have left the rural scene except in isolated, ritually significant locations. Fast-growing eucalyptus trees imported by Emperor Menilek from Australia in 1895 aided urban fuel needs, it has but have obviously failed to regenerate forests. In both cases, recovery can only take place with a decline of demographic pressure, though in the case of forests, only as secondary growth.

Feeding the State: Productivity and the Political Domain

There are several ways that smallholder agricultural production and productivity can be affected by the political domain:

- 1) the structure of taxes and tribute
- 2) state/elite demands on agricultural labor
- 3) effects of sporadic military activity

The expansion of central state authority over local prerogatives in northern Ethiopia has been a dominant historical theme from 1889 through the post-war period. The evidence also suggests that this expansion has allowed state policies determined in Addis Ababa to penetrate to the farm level to a degree impossible prior to the 1920s. The most overriding and consistent feature of politics over peasant agriculture the course of the twentieth century has been the expansion of the state's willingness and ability to affect the nature of production extracted locally. The process began slowly since in the nineteenth century and through most of Menilek's reign the central government had severe restrictions on its ability to communicate with, extract revenue from, and coerce the local process of agriculture.⁵⁸ The ability to overawe or militarily suppress opposition was restricted to one or two areas at a time, having a symbolic as much as real effect.

⁵⁶ I have drawn these comparative statistics from two separate surveys. See Getachew Tecele Medhin and Telahun Makonnen, "Socio-economic Characteristics of the Central Highlands of Ethiopia - Ada Wereda," unpublished report to the Ministry of Agriculture, 1974, 26 and Gryseels and Anderson, *Research*, 14.

⁵⁷ See note 45 above. Also Messerli, *Simen*, 58; and McCann, *Poverty to Famine*, 80.

⁵⁸ The shift of the asrat from support of the church to support of local military was a notable exception, though its implementation was sporadic. See Joanna Mantel-Niecko, *The Role of Land Tenure in the System of the Ethiopian Imperial Government in Modern Times* (Warsaw, 1980), 208-209.

The process of state intervention in local political economies began in earnest in the early 1920s with policies of "fiscalism" initiated by Ras Tafari at the center but also by regional elites such as Ras Hailu in Gojjam, Ras Kassa in Wallo, Rases Siyum and Gugsu Araya in Tigray, and more localized elite.⁵⁹ In the half-decade which followed his coronation as Haile Sellassie I, the emperor systematically reorganized customs collection, appointed loyalists to regional office, and began fiscal reforms to undercut prerogatives of local elite.⁶⁰

Specific aspects of centralization and the expansion of state authority affected the local terms of agricultural production. Shifts in fiscal policy from proportional to fixed assessment and from in-kind to cash payments challenged the basis for subsistence strategies.⁶¹ Officials from the state collecting the asrat (tithe) to fill local state granaries also required additional payment of fixed taxes and special collections in cash. The effect of the increased state presence locally appeared most dramatically in the state's ability to organize and centralize customs collections, a traditional prerogative of the local and regional elite. Revenue lost to rural elite could be recovered only by the more rigorous exercise of exactions on local agriculture. That many of Ethiopia's regional elites had begun to undertake urban residence and urban investment only increased their need for cash payments from their local constituencies.⁶²

Evidence for understanding the effects of increased tax burdens, particularly those in cash, on agricultural production is scarce. From recent evidence, however, some effects are evident. The ultimate sanction held by the state over rural producers was the ability to confiscate land or withhold access to it for nonpayment of taxes. The ability to tax in traditional law bore with it an implied authority to alienate land, and this ability has continued after the agrarian reform program.⁶³ Farmers appear willing, now as in the past, to liquidate productive assets in order to maintain their access to land.

My own observations of farm strategies under stress indicates that fixed tax demands during crisis or recovery often results in capital disinvestment (selling of oxen or farm implements), the expansion of debt, and increased

⁵⁹ The crushing or subjugation of elite opposition in the north proceeded with Ras Gugsu in 1930, Ras Hailu in 1932, and Ras Siyum in 1932. The method differed in each case but the end result was the further extension of central government power. Control over key areas like Hararge and Shawa had taken place much earlier.

⁶⁰ For accounts of this period see Harold G. Marcus, "The Infrastructure of the Italo-Ethiopian Crisis: Haile Sellassie, the Solomonic Empire and the World Economy, 1916-1936," in *Proceedings of the Fifth International Conference on Ethiopian Studies* (Chicago, 1979), 559-568; and McCann, *From Poverty to Famine*, 127-172. Both accounts use Italian consular reports which provide an excellent, almost daily, account of central government actions in expanding its reach to the provincial and district level.

⁶¹ For a description of the relative effects of fixed over proportional payments see James Scott, *The Moral Economy of the Peasant: Rebellion and Subsistence in Southeast Asia* (New Haven, 1976), 53.

⁶² Ras Hailu is the most often cited example, but Ras Kassa, Wagshum Kabbada, and many others had established a firm financial presence in Addis Ababa and in regional capitals by 1930. Running such elaborate households required food and labor but also, increasingly, cash. For a good description of life at court see Harold G. Marcus, *The Life and Times of Menilek II: Ethiopia, 1844-1913* (Oxford, 1975), 218-225.

⁶³ See Mantel-Niecko, *Land Tenure*, 110-111, here defined as crimes against the state. My own interviews with farmers faced with tax problems indicates a similar fear of loss of land.

dependence on off-farm income. In northern Shawa in 1985, for example, I interviewed drought-stricken farmers required to pay both a land tax, a drought tax, and special fees. Faced with the prospect of losing access to land, most farmers chose to decapitalize their farms (i.e. sell oxen, seed, or tools) to meet a tax burden. Though faced by a tax burden under a peasant association rather than a traditional melkenya, the peasant's decision to liquidate assets reflected a farm level economic decision similar, I believe, to one a farmer two generations ago probably chose. The increased administrative capacity of the state to enforce tax payments by involvement in the land allocation process has given tax payments a power beyond that in the past. Still, this process of change has been a gradual one for which the 1920s and 1930s were as much a watershed as the 1970s.

The process of capital disinvestment in the rural economy has been examined recently as an issue of famine response. Yet, the stress of famine conditions would appear to be only one type of crisis resulting in decapitalization of small farms.⁶⁴ Farmer's decisions to disinvest in agriculture and liquidate capital assets over the short or long term are indeed famine responses, but equally it can be a response to political circumstances. Political conditions have caused similar decisions which compromise the long-term welfare of the farm enterprise to short-term exigencies. Wallo farmers during the 1928-30 Ras Gugsu rebellion, for example, sold off stocks of grain at well below market price to avoid its appropriation by roving bands or rebels or government levies.⁶⁵ The conditions for doing so have existed at several points over the course of the twentieth century because of the persistence of political instability.

The resistance of local interests to this expansion of state power has resulted in a persistent pattern of local and regional rebellion and military campaigns aimed at suppressing them. Between 1898 and 1945 at least nine major campaigns lasting from several months to several years took place in the northeastern highlands. The resistance took the form of elite-led rural rebellions aimed at forestalling the loss of local income and political power.⁶⁶ Until the mid-1970s the central state won the day at every turn, allowing a consistent expansion of policies of taxation, customs control, and the presence of state officials. The centralization of state prerogatives since 1974 is an extension of a much broader trend, though recent success at suppressing local resistance has lessened considerably.

⁶⁴ Peter Cutler has looked carefully at the relationship between grain and livestock prices during drought and at the timing of oxen sales during crisis. Peter Cutler, "Famine Forecasting: prices and peasant behavior in northern Ethiopia," *Disasters* (1984), 48-56 and personal communication. For non-famine causes of decapitalization see Dan Bauer, *Household and Society in Ethiopia* (East Lansing, 1977), 92-94.

⁶⁵ Corrado Zoli, *Cronache Etiopiche* (Rome, 1931), 329.

⁶⁶ The chronology of these events derives from monthly and sometimes daily reports from British, Sudanese, and Italian sources as well as local oral tradition and eyewitness accounts. For a narrative account see James McCann, "Households, Peasants, and Rural History in Lasta, Northern Ethiopia 1900-35" (Ph.D. dissertation, Michigan State University, 1984), 145-197. For Wayane see Gebru Tareke, "Peasant Resistance in Ethiopia: The Case of Wayane," *Journal of African History*, 25 (1984), 77-92.

The intensity and effect of these frequent military campaigns and calls to arms on local production is a point of debate.⁶⁷ The epidemics and food shortages which often ended them may as likely been caused by the concentration of humanity as by natural environmental factors. Eastern Tigray and northern Wallo suffered more intensely and more frequently than other areas like Gondar or Gojjam, though the effects were sporadic. There is thus little new about farmers attempting to cultivate, harvest, and store their crops under the specter of ravenous troops, raiding parties or the conscription of their young men.

Beyond consuming food supplies, traction animals and overwhelming sensitive balances of local health, the armies on all sides recruited and attracted young male labor away from the drudgery of farm work to the excitement of raiding and military achievement both for and against the central government. The loss of young men and even young women to local movements of resistance is therefore not a new phenomenon. Nor is the exodus of northern Ethiopians across the Sudan border to seek better economic opportunity and safer political conditions. Throughout the 1920s and 30s a steady flow of escaped slaves, politically disaffected officials, and labor migrants crossed into the Anglo-Egyptian Sudan in the 1920s and 1930s.⁶⁸ Beginning in 1935 a large number of soldiers, officials, and hangers-on spent the Italian occupation in Khartoum/Omdurman and Sudanese border towns. Still others from Eritrea, Tigray, Bagemder, and Gojjam took seasonal wage labor in the developing Sudanese agricultural economy near the border.⁶⁹ Perhaps as many as 100,000 young men from Eritrea and northern Ethiopia joined Italian forces in Libya as soldiers--a form of target labor--between 1911 and 1932.⁷⁰ I would argue that such phenomena are the result far more than the cause of productivity decline.

Conclusion

In the twentieth century agriculture and the conditions of rural production in highland Ethiopia have been part of a historical conjuncture between the mature stage of a agrarian economic cycle and the growth of a modern political economy and its state. Far from being static, the various components of agricultural production--population, farming systems, technology--

⁶⁷ I would argue, however, that pre-1960 campaigns put greater stress on local resources and production than their more contemporary analogues. The numbers of troops concentrated at any one point were considerably higher than anything in the past decade and poor transportation infrastructure meant that armies' dependence on local resources was much more substantial. For the broader historical case see Richard Caulk, "Armies as Predators: Soldiers and Peasants in Ethiopia c. 1850-1935," *International Journal of African Historical Studies*, 11,3 (1979), 457-493. Caulk never addresses fully the question of military action on overall productivity but points to the devastating effect on specific areas of military activity.

⁶⁸ Monthly records of border crossings were kept by Sudan district commissioners in Kassala, Blue Nile, and White Nile provincial records. See INTEL files and provincial records housed at the National Record Office, Khartoum.

⁶⁹ See McCann, *Poverty to Famine*, 185-193; The *Sudan Monthly Record* contains monthly tallies of refugees from Ethiopia. See issues 1-83, 1929-37 held in the Sudan Library, University of Khartoum.

⁷⁰ See Campbell Telegram to Foreign Office, 8 November 1918, FO 371/79730 Public Records Office, London and McCann, *Poverty to Famine*, 189-191.

have each had to adjust themselves to new conditions in markets, politics, and the constraints in resources like land, livestock, and labor. The process has neither been uniform nor "progressive": Simen's progress has been different than Gojjam's, Ada's different from Ankober's. Yet, overall the evidence suggests strongly that productivity, even where the rural economy has been most dynamic, has been in a fairly steady decline over the course of the twentieth century.

This paper has outlined the evidence for productivity decline and, more broadly, the progression of an agrarian cycle which has reached a point of a crisis in productivity which has been several generations in coming. The effects of these cumulative processes have begun to show in the last two decades, but the roots exist in the beginnings of a major agrarian cycle which produced, overall, a balance of its resources and technical capacity in the post-war years but quickly matured and began its accelerating decline in the mid-1960s.

The issue has not been the farming system's lack of resiliency as a system of social production—it has endured and expanded for more than a millennium—but its failure to break the technological impasse as demands upon it have grown. The system which historically thrived through its ability to expand spatially has failed to adapt to political, climatological, and economic limits on further expansion and has not demonstrated a capacity to intensify through increasing returns to labor or to generate local capital. The growth of urban centers of consumption and political power has placed additional demands on production but failed fundamentally to transform the basis of agricultural productivity. The dramatic breakthrough in state power to effect agrarian policy and to extract resources from rural areas begun in the 1920s and consummated with programs of resettlement and villagization in the 1980s has not resulted in a parallel breakthrough in technology of resource use. In many ways the 1974 revolution was a response to the state's failure in the 1960s and early 70s through its effects on the national economy. The short-term resolution has been that the urban centers of power have been able to derive their own food from surplus production areas (Gojjam, Arsi, Shawa) where climate has been favorable and the "Malthusian scissors" have yet to close.