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Paradigms and Politics: The Cultural Construction of Environmental Policy in Ethiopia

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Summary. — In the wake of the 1985 famine, the Ethiopian government launched an ambitious program of environmental reclamation supported by donors and nongovernment organizations and backed by the largest food-for-work program in Africa. In retrospect, it is clear that much of this effort was wasted or counterproductive. While many factors contributed to the reclamation program's poor performance, this essay is primarily concerned with the role of a neo-Malthusian environmental policy narrative that was used by government and donors alike to justify the rapid, massive and widespread use of standardized environmental management "packages" without research on their environmental impact or their economic costs and benefits. Understanding the context in which this happened is important for key elements of the narrative still inform thinking and planning in Ethiopia. There is mounting evidence that the use of narratives in this type in environmental management programs and, more generally, in many other types of development planning is widespread and costly.

1. INTRODUCTION

In the wake of the 1985 famine, the Ethiopian government launched an ambitious program of environmental reclamation supported by donors and nongovernment organizations and backed by the largest food-for-work program in Africa. Over the following five years, peasants constructed more than one million kilometers of soil and stone bunds on agricultural land and built almost one-half million kilometers of hillside terrace. They also closed off more than 80,000 hectares of hillside to most forms of use to foster the regeneration of naturally occurring plant species, and planted 300,000 hectares of trees, much of it in community woodlots.

Today, in retrospect, it is clear that much of this effort was wasted or counterproductive. The long and short-term soil conservation benefits of the structures and trees are uncertain. The most rigorous research conducted to date shows that under most conditions terracing has lowered agricultural production instead of raising it as had been anticipated (Herweg, 1992). Farmers have been unwilling to construct or maintain structures without food for work or coercion, and many of the structures have fallen into disrepair. Most community woodlots have been harvested or destroyed. Hillside closures had mixed results. Where they were built best, they tended to reduce household income from livestock, to cause environmental damage by concentrating livestock on the remaining pasture and to harbor wild animals and pests.

Many factors contributed to the reclamation program's poor performance. It was based on inadequate scientific and technical knowledge. It was implemented with a standardized approach and with little regard to regional or local agro-ecological conditions. The views and interests of the rural men and women it was intended to benefit were not solicited or heeded. Instead, implementation was top-down, authoritarian and politicized. Peasant interest in investing in long-term environmental management, to the extent that it had existed, had been undermined by the government's land reform program.

My central concern here is not why the program failed, but how it was brought about. My concern is with the role of a neo-Malthusian environmental policy narrative that was used by government and donors alike to justify the rapid, massive and widespread use of standardized environmental management "packages" without research on their environmental impact or their economic costs and benefits. Understanding the context in which this happened is important in

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prospect as well as retrospect, for key elements of the narrative still inform thinking and planning in Ethiopia. Moreover, there is mounting evidence that the use of narratives of this type of environmental management programs and, more generally, in many other types of development planning is widespread and costly.

It should be emphasized from the outset that I am concerned with the common discourse about population, environment and famine in Ethiopia that was used by various actors and agencies involved in the reclamation program. I am not primarily concerned with what individuals "really" thought, with their personal motives or the details of decision-making processes. This essay is not an attempt to second-guess the experts. It is not a history of the reclamation program, and it is not an exposé or attack on the Ethiopian and expatriate experts who designed and implemented it.

The next section is concerned with the role of narratives and what I will call cultural paradigms in planning for development and environmental management. The following section provides background information on environmental degradation, indigeneous conservation and the impact of the agrarian reform program instituted after 1974 on peasant incentives for environmental management. After this, I analyze the genesis of the Ethiopian environmental reclamation program in the mid-1980s. Finally, I consider continuity and change in recent developments in Ethiopian environmental management and place the Ethiopian case study in a wider comparative perspective.

2. THE ROLE OF NARRATIVES AND CULTURAL PARADIGMS IN DEVELOPMENT AND ENVIRONMENTAL PLANNING

The role of simplifying narratives in development is not limited to environmental programs. In his ground-breaking 1968 study, *Development Projects Observed*, Hirschman pointed out that effective development policies and programs (i.e ones that succeed in mobilizing funds, institutions and technology) rest on a set of more or less naive, unproven, simplifying and optimistic assumptions about the problem to be addressed and the approach to be taken. Without such a cultural script for action it is difficult for donors and aid recipients to mobilize and coordinate concerted action in the face of many uncertainties that characterize processes of economic, political and institutional change everywhere, but especially in the less-developed countries.

Recently, Emery Roe has observed that these optimistic "enabling assumptions" are generally encoded in what he calls "development narratives" — sometimes, as with the tragedy of the commons narrative, as a story with a beginning, a middle, and an end that purports to describe and explain the problem to be addressed (1991). Though Roe does not elaborate the point, it is clear that the power of these narratives is enhanced through the incorporation of dominant symbols, ideologies and real or imagined historical experience of their adherents. In this sense they are culturally constructed and reflect the hegemony of Western development discourse.

Policy narratives have a number of distinctive characteristics. Whatever their origins in religion, myth or Western scientific findings, they initially represent the views of articulate First World experts or domestic constituencies. Over time they gather additional adherents in the professional development community and in the developing nations. They come to play a central role in policy and project-level decision making. They do this by structuring options, defining what are to be considered relevant data, and ruling out the consideration of alternative paradigms from the outset. They are robust, exercising great influence at the preattentive stage of choice, thus discouraging scientific research that can discredit them. They are hard to challenge and slow to change, even in the face of mounting evidence that does not support them.

To the extent that a particular development narrative becomes influential in donor community development discourse it becomes actualized in specific development programs, projects, packages and methodologies of data collection and analysis. All of these constitute what I will gloss as the cultural paradigm associated with the narrative. The cultural policy paradigm, in the sense I am using it, is thus based on concrete examplars as well as on a set of ideas. It is not merely a set of beliefs or a theory but a blueprint for action as well.[2]

Nowhere is the power of policy narratives and paradigms illustrated more clearly than in environmental planning in developing countries. The environmental policies promoted by colonial regimes and later by donors in Africa rest on historically grounded, culturally constructed paradigms that at once describe a problem and prescribe its solution. Many of them are rooted in a narrative that tells us how things were in an earlier time when people lived in harmony with nature, how human agency has altered that harmony, and of the calamities that will plague people and nature if dramatic action is not taken soon. It is not surprising that the narratives remind us more or less explicitly of the fall from Eden and are neo-Malthusian.

What is perhaps most striking and discouraging is that often they are wrong, misrepresenting environmental conditions and trends, the role of human agency in causing the trends, or both. Recent research indicates that this has been the case with widely used environmental paradigms (see concluding section).

Regardless of its merit, an environmental paradigm is transferred to aid recipient countries through training, institution building and investment. These activities attract and create elite interest groups which, in turn, become its constituency making it politically difficult to discard. The paradigm is further reinforced as it is used to define the parameters of legitimate research methods and what is to be considered credible data (see Stocking, 1994; Leach and Fairhead, 1994; Fairhead and Leach, this issue). It is infused into urban-based national culture through media campaigns and associated with national symbols and political figures and agenda. It permeates to local-level development discourse, as community leaders learn what to say to get assistance, even if it is in stark contradiction to their experience and knowledge of local conditions (Leach and Fairhead, 1994). The paradigm has thus become culturally, institutionally, and politically embedded in the developing countries. Unfortunately, under these circumstances, the influence and durability of a dominant development policy narrative is not necessarily related to its economic, social or environmental consequences. The narrative, and resource flows associated with it, becomes hard to challenge, even if it loses its currency in the donor community, as has happened recently with the desertification narrative.

Environmental rehabilitation programs carried out in Ethiopia in the mid-1980s illustrate many of these processes and attendant problems. They must be understood, however, against the background of Ethiopia's distinctive physical and institutional environment, its radical agrarian reform program, civil strife, and the famine of 1985.

3. BACKGROUND

(a) *The physical setting: fragile riches*

Though Ethiopia is relatively well endowed with natural resources by African standards, its landscape shows signs of degradation interpreted by many experts as indicators of impending environmental crisis.[3] Propitious conditions for indigenous agriculture are concentrated in the highlands above 1,500 meters which comprise 43% of the country. Here a combination of favorable rainfall and soils have fostered the development of a variety of farming systems which have supported major concentrations of population and complex societies for several millennia.

In spite of this natural endowment, Ethiopia today is believed by experts to face an environmental crisis. Much of the north has a dissected, sloping terrain, fragile soils and is subject to highly erosive rainstorms during the main agricultural season. This area has little natural tree cover; its soils are low in organic matter and are subject to severe soil erosion. The plow-based mixed farming system contributes to soil erosion through fine tilling, monocropping, and a lack of vegetative cover during part of the heavy rains. On the central and southern highlands, where rainfall is higher and distributed over more of the year, soils are generally higher in organic matter. Land form is less rugged and there is more natural vegetative cover. In the present century natural forest, which was extensive, has been reduced and grasslands brought under the plow by a combination of conquest, spontaneous small-farmer migration, government-sponsored resettlement, expanding commercial and state farms, and private and state exploitation of the forests. Soil erosion appears to be less severe than in the north. As we shall see, the neo-Malthusian environmental narrative with which we are concerned exaggerates the rate and magnitude of degradation and misrepresents the role of human agency in causing it, but there can be no doubt that there are serious problems of soil erosion in extensive areas of highland Ethiopia.

(b) *Indigeneous environmental management before the revolution of 1974*

Northern Ethiopians have long managed their landscapes and practiced some forms of conservation. Historically, however, political, institutional, and economic conditions did not give landed elites or peasants strong incentives to invest in agricultural intensification and labor intensive conservation measures, such as indigenous terracing. In any case, "the main recurrent environmental problems in the northern highland environment were animal and human disease, crop-destroying pests, and adverse weather conditions" (McCann, 1987, p. 27). The relationship between man and nature in northern Euthiopia has long been characterized by flux, crisis and calamity, rather than by a harmonious balance (Mesfin, 1992). Indigenous southern Ethiopia farming systems were more sustainable before the present century, when many of them were altered by northern conquest.

The dominant secular ethos of northern Ethiopian (Amhara and Tigrean) society was military, rather than agrarian. At many times, security could not be guaranteed by the state, and warfare was not uncommon. For lord and peasant alike, the path to upward mobility lay in combat and command, not in cultivation, commerce, or the accumulation of capital. Members of the secular elite held quasi-feudal land rights (Amharic *gult*) over peasant communities that entitled them to rule and tax their subjects but not to treat the peasants as tenants or tell them how to farm. Many types of feudal land grants were of short duration. Even where grants were in principle hereditary, patterns of secession, inheritance and naming militated against the formation of transgenerational interest in improved land management. With limited

exceptions there were no clearly defined ruling families grounded in the possession of particular landed estates, titles or offices.

Nobles and local notables enjoyed the taxes, tribute, labor and military services of their peasants, but their economic strategy was primarily oriented to increased extraction, not investment. Significant increases in revenue were to be secured by obtaining control over additional land grants. The path to upward mobility for the lord was thus through success in court politics, loyal service to his liege lord and military prowess, especially in the conquest of new lands. The Ethiopian landed gentry and great lords, unlike their true counterparts in some other feudal societies, did not sponsor public works designed to maintain and enhance the long-term productivity of the land.

If the nobles and gentry did not have strong incentives to make long-term investments in the land, neither did the peasants. Peasants enjoyed reasonable security of access to a share of their ancestral lands, but not to particular fields. The periodic reallocation of land, the scattered and changing composition of the parcels that constituted a household's holding, and the division and redistribution associated with inheritance, all militated against the concept of a family farm or homestead. There was, in northern Ethiopia, no concept of an enduring family estate or farm with its houses, lands and other assets, with an identity of its own, to be passed down through the generations. There was neither a religious attachment to ancestral land nor a named, status-bearing family line to be perpetuated to the glory of a father or the honor of his sons. Indeed, if they could, most men hoped to build their own homestead rather than to live in their father's house. This weak sense of familial continuity, together with the facts that his land parcels might be reallocated to a distant kinsman and that he could not sell them for a profit or be certain of leaving them to his heirs, reduced a farmer's incentive to invest in long-term improvements in his land (Hoben, 1975; Bauer, 1977).

Northern peasants have been well aware of soil erosion and traditionally have had a number of techniques for coping with it. Peasants in Wallo, for example, were familiar with bunding, terracing, contour ridging, hedging, strip cropping, ratooning and mulching (Dessalegn, 1987). They had little incentive, however, to use these techniques, especially those that required major, long-term investments, as a part of a strategy of agricultural intensification. Their control over particular fields was insecure. Agricultural production was primarily for subsistance, tax and tribute. Transport costs were high, towns few, and markets poorly developed. As one peasant remarked to the author in explaining why he did not use the more intensive techniques he had just described, "we are lazy here because money is too expensive."

The indigenous farming systems of southern Ethiopia did not cause serious environmental degradation. The densely populated southwestern highland areas were characterized by intensive, highly integrated horticulture based on a complex mix of annual and perennial crops, including roots and tubers. *Ensete*, a banana-like plant with a trunk that is processed into a starchy staple food, was grown in thick sands around each homestead. Agricultural techniques included hoeing, mounding, mulching and, in some areas, terracing and irrigation. The systems were very labor-intensive. Victors in local wars sometimes claimed the labor rather than the land of those they vanquished. The southeastern highlands of Arsi and Bali were largely populated by agro-pastoral peoples with comparatively low population densities. There were also extensive forested areas to the west and southwest in Wellega and Illubabor-Jima. Farther to the south and southwest, in the lowlands, tribal groups practiced various combinations of agro-pastoralism and shifting cultivation.

The conquest and occupation of what is now southern Ethiopia by the northern Ethiopian armies in the last decades of the 19th century brought with it new pressures on the environment. Large numbers of northerners settled in the agro-pastoral regions, taking their plow-based agricultural system with them. In the densely settled regions a form of extractive serfdom was established. Indigeneous peoples were forced to give labor and tribute to northern overlords and local notables. The introduction of the plow and of grain crops to meet northerners' demands, as well as the new labor demands, appear to have contributed to new problems of soil erosion. Northern settlers also moved southward into forested areas in the west, clearing the land and introducing plow agriculture.

On the eve of the revolution a majority of farming households in the southern highlands worked as serfs or sharecropping tenants. Tenants had little security and might owe as much as three days' labor per week or half their crops plus other gifts and services, to their landlords. In some parts of this region there were also small farmers enjoying something approaching freehold. In southern Chilalo these farmers quickly took up the improved farming practices introduced by the Swedish CADU maximum package development project (Cohen, 1987). Overall, however, the more accessible parts of the south were characterized by a very unequal distribution of land and great inequalities of status and security. In the more peripheral areas of the empire tribal groups continued to use land and pasture under more or less indigenous arrangements, except where disturbed by government or private development initiatives. The 1960s saw the beginning of large- and small-scale commercial farming in the corridors along the roads to the south and west of Addis Ababa. This process was largely stopped by the revolution and agrarian reform program of 1974.

4. THE IMPACT OF AGRARIAN REFORM

Between 1974 and the late 1980s, the military regime of Mengistu Haile Mariam (the Derg) pressed an ambitious program of agrarian reform intended to transform rural social economic and political institutions and spur agricultural development, increase food security and address environmental problems, including deforestation and soil erosion. Ironically, the net effect of the Derg's actions, was to lessen farmer's incentives for good natural resource management by decreasing both the security of land tenure and the profitability of agriculture. At the same time it appears to have reduced, instead of increased, food security in many areas (Cohen and Isaksson, 1988).

The program included the nationalization of natural resources, land tenure reform, the promotion of production and service cooperatives, the establishment of state farms, the imposition of production quotas, state intervention in pricing and marketing, forced villagization, large-scale long-distance resettlement, and the environmental reclamation programs which are discussed in the next section. As the Derg struggled with a prolonged and ever more costly civil war, it also imposed taxes, required voluntary contributions and requisitioned unpaid labor, demands which often exceeded those experienced under the previous regime.

(a) *Land reform and expropriation*

The Derg's land reform program, launched in 1975, was very successful in eliminating large holdings, absentee landlordism and landlessness. It redistributed land within peasant communities on a relatively equitable basis, though it did not address intercommunity or interregional inequalities. In most areas, land reform did not solve the problem of acute land shortage. The size of peasant holdings continued to dwindle as new households pressed their claim to land. Over time, the repeated redistribution of land and the disturbance of holdings for a series of new government programs undermined peasants' security over particular parcels of land and decreased their incentives to use existing or new land management practices.[5]

Under the 1975 reform, all customary and other preexisting land rights were extinguished, and all land was declared to be public property. Individual households could farm up to 10 hectares of land. In practice they generally received much less, often less than three hectares. They had only usufruct rights over the land they cultivated, rights they could not transfer by sale, lease or mortgage. The land was subject to periodic reallocations by Peasant Associations (PAs) to balance inequalities or to accommodate new claimants. Government policies and actions also created the widespread impression that trees, in some cases including privately planted trees around homesteads, belonged to the state and could not be harvested without the permission of the authorities. The reform also abolished tenancy, agricultural wage labor, and other forms of peasant dependency on the landed classes. Large holdings were confiscated and turned into state farms, settlement schemes, or cooperatives.

Initially, in the southern and western part of the country, land reform was welcomed by former tenants, and serfs who hoped they would have secure tenure over their holdings. In the northern highlands there was some resistance to reform by better-off peasants, though it was generally welcomed by poor and young households and landless artisans.

From the outset, however, Ethiopia's new leaders were committed to moving away from individual control over land toward producers' cooperatives (collectives) and state farms. Throughout the decade of the 1980s the central government used its increasing top-down control to institute a series of programs intended to move rural society in this direction and achieve other central government objectives.

The dictum that all land belonged to the state led the government to expropriate land for many of its new initiatives. Programs that resulted in the dislocation of peasants and decreased land security included the expansion of state farms, a large-scale resettlement program in the wake of the 1984–85 famine, the expropriation of land without compensation for government projects, and the crash agroforestry and enclosure projects discussed in the next section.

In the last analysis, it was the arbitrary exercise of top-down authority by party cadres competing with ministry officials to institute reform that reduced the security with which peasants held their land. By the early 1980s Peasant Association leaders were regularly taking land from their members for new government programs or requiring them to relocate their homes. There was no law or procedure concerning compensation in such cases. Over the decade the Ministry of Education evicted approximately 80,000 households for its school-building programs. The Ministry of Coffee and Tea evicted over 15,000 households, water projects evicted 29,000, state farms over 90,000, and the Ministry of Agriculture 38,000 (for forestry and extension). These figures are dwarfed by the two million households (an estimated 8–10 million people) who were evicted and relocated by collectivization and villagization, and the more than one-half million households who were moved to the western lowlands in the resettlement campaign triggered by the 1984–85 drought (Dessalegn, 1991).

(b) *Production cooperatives*

The most direct challenge to individual rights in land was the establishment of production cooperatives (PCs). PCs were organized with the backing of party cadres and Ministry of Agriculture officials, by "progressive" members of a PA. They were able to appropriate the best land in each community and valuable natural resources, such as pasture land, water points and the like, for their agricultural and other enterprises. They were also able to command unpaid labor from members of their own and nearby communities. The formation of PCs thus often involved evicting large numbers of households and relocating them elsewhere, often on marginal land. Members who later wished to leave the cooperative forfeited their right to the land and other capital assets they had brought into the cooperative enterprise. PCs were unpopular among their own membership as well as among the surrounding peasantry. Though at their height cooperatives worked less than 15% of the agricultural land, the program was perceived by peasants as a major threat to their security of tenure.

All available evidence indicates that PCs were inefficient to individual farming in terms of productivity and resource management. Just how unpopular the enterprises were became evident when Mengistu announced a policy shift toward a mixed economy. Within a week all but a few of the nation's 3,732 registered PCs had been disbanded.

(c) *Rural economic policy*

A number of economic policies decreased peasant food security. As the Derg's land policy was decreasing farmers' incentives to invest in their land, its agricultural investment and marketing and pricing policies were having the same effect by reducing the profitability of agriculture. State farms received priority in the allocation of land, machinery, credit and chemical fertilizer. Though in the late 1980s they occupied only 2% of the cultivated land and contributed only 10% of marketed agricultural production, they received approximately 70% of agricultural credits. Within the present sector, the bulk of the Ministry of Agriculture's support went to producer's cooperatives, though their membership probably never exceeded 5% of all peasant households (IUCN, 1990, p. 41). Throughout the 1980s, only 15% of the government's recurrent and capital expenditures on agriculture went to peasant agriculture, including the PCs. Yet all studies indicate that peasant farming remained more efficient than either PCs or state farms by any measure.

From the early 1980s until the beginning of 1988, severe restrictions were imposed on private merchants. At the same time, production quotas, rigid below-market prices and an ineffective state Agricultural Marketing Corporation reduced farm-gate prices.

Falling per capita food production reduced Ethiopia's ability to cope with drought, crop disease and war. Other restrictions on peasants' coping strategies also contributed to household food insecurity. Important among these were restrictions on labor migation, share-cropping and wage labor in agriculture, restrictions on trade and attempts to discourage rural people from engaging in more than one income-generating activity. All of these measures weakened rural people's security of access to food.

(d) *Villagization*

Another threat to peasants' security of land tenure was brought about by the Derg's ambitious and hurried villagization program, which was comparable in many ways to that undertaken by Tanzania in the mid-1970s. The program was intended to facilitate agricultural and social service delivery, social and political change and the formation of PCs. Instead, it brought about further movement and disruption of individuals' land rights and caused many other problems, including environmental degradation, the loss of livestock through disease and reduced access to pasture, poor sanitation and the decapitalization, especially in the southwest, of farms depending on *ensete* (false banana) and tree crops planted near the homestead.

Together, all these policies appear to have depressed agricultural production and discouraged farmers from developing more intensive farming systems in the face of rising population and investing in intermediate or long-term natural resource management (IUCN, 1990, pp. 41–42). Indeed, it can be argued that they destabilized local food security systems and made the rural population more vulnerable than ever to drought and famine.

5. THE RECLAMATION PROGRAM (1985–88)

In the aftermath of the drought and famine of 1985 Western donors and nongovernment organization (NGOs) needed a narrative that would give them a rationale for justifying the continuation of food aid to Ethiopia, a blueprint for what to do with it, and a way of coordinating their program with the Ethiopian regime, for which they had little regard. Under these circumstances, the idea that the underlying cause of Ethiopia's periodic famines was environmental degradation due to population increase, poverty and poor farming practices had great appeal. It provided the justification for a massive food-for-work program supporting local-level reclamation projects. Ultimately the program proved to be ineffective in many ways. It

foundered as the Derg regime faltered and fell. Some lessons were learned from this experience, but the environmental policy narrative that informed it has proven surprisingly resilient. It is instructive to examine the narrative and the evidence that is presented to support it in some detail, as well as the nature of its appeal to the donors and the regime.

(a) *The narrative*

The core narrative is quite simple: "Long ago when there were fewer people in Ethiopia, indigenous farming systems and technology enabled them to make a living without seriously depleting their natural resources. Over the present century human and animal populations have grown. Indigenous farming systems have been unable to keep up. Population has exceeded carrying capacity, causing ever-increasing and perhaps irreversible environmental damage. Only a massive investment in environmental reclamation can reverse this process. People are unable to make this investment without outside assistance because they do not know how and because they are too poor to forego present for future income or to provide for their children."

The narrative is not new, and it is not peculiar to Ethiopia. It came to play a more central role in East African soil conservation and forestry policy in Africa in the 1930s (Anderson, 1984). It has been reenunciated and reinforced and Africanized in the wake of the environmental movement in the West, as it fits well with its interest, understandings, sentiments and with the deeply rooted Western image of Africa as a spoiled Eden.

The basic narrative has a number of elaborations or "corollary narratives" that contextualize it in Ethiopia by "explaining" the processes that have caused degradation and establishing the magnitude of the impending disaster. These narratives, in varying combinations, are concerned with soil, trees and water. In the past, a period seldom defined more precisely than "before the present century," environmental degradation occurred around settlements, but communities could always move to new land, which was abundant. There was little need for conservation. The landscape was generously covered with trees, brush and grasses. A higher proportion of rain water percolated into the soil. Erosion was held in check and wood fuel was abundant, easily obtained and cheap.

Over the present century, we are told, population growth increased, due to the partial control of epidemics and relative peace. New land was no longer easily available and fallowing periods shortened until land was under continuous cultivation. At the same time, forests are said to have been cut for firewood and agricultural expansion. A decrease in forest cover from 40% to less than 3% in the present century is an oft-repeated figure. The increasing scarcity of firewood has caused peasants to use cow-dung as a household fuel instead of using it to replace the organic matter in their fields. Steeper hillsides have been cleared and denuded of vegetation. Cultivation and overgrazing have left the soils exposed to Ethiopia's heavy rainstorms, causing severe soil erosion, reducing the nutrients available to crops and letting water run freely into the streams and rivers. Increasing livestock pressure had led to overgrazing and the deterioration of the ever-shrinking pasture land.

Though the data supporting these assertions are admittedly thin and circumstantial, powerful conclusions have been made about the rate and magnitude and direction of agro-environmental decline. In 1984, a Ministry of Agriculture and FAO study concluded that in densely settled regions of Wallo, Gondar and northern Shoa on the "frontier" of serious degradation, soil erosion and a decline in organic matter are estimated to be reducing crop yields at 2% per year. Based on current trends, the study describes a scenario in which by 2010 land incapable of supporting agriculture will increase from two million to 10 million hectares or 17% of highland Ethiopia (Ministry of Agriculture and FAO, 1984 cited in Ståhl, 1990, p. 3). Another study indicates that by the same date three-quarters of all districts will be chronically food deficient (FAO/UNDP, 1984/cited in Ståhl, 1990, p. 3).

(b) *The actors*

The neo-Malthusian environmental degradation narrative appealed to each of the major actors involved in the reclamation program for a variety of reasons. It enabled the major Western donors, the World Food Program (WFP), the European Economic Community (EEC), and the United States to justify a massive food-for-work program on the grounds that they were addressing the long-term, underlying cause of famine, rather than merely alleviating its symptoms. This enabled them to meet the criticism that they were only "keeping people alive so that they could die in larger numbers the next time the rains failed." The donors were also able to counter the argument that the food aid would make people lazy. In addition, the narrative provided the donors with a rationale for maintaining high levels of food aid after the famine was over and for delivering food to areas that had not been affected by drought or famine.

The Reagan administration had initially opposed giving humanitarian aid on the grounds that it would strengthen a government that was violating human rights, pursuing a protracted civil war in the north, following bad economic policies and aligned with the Soviet Union. Domestic political pressure forced them to provide food aid. Under these circumstances the reclamation program was a least-bad option, as it was

narrowly technical, largely bypassed the Ethiopian government, was targeted directly on the rural poor and would be welcomed by the growing environmental lobby in Washington.

Western NGOs were comfortable with the rationale for the reclamation program because it fit well with their ideals of helping people directly, teaching while helping, working with communities, rather the private sector or government, and their domestic constituency's concern with "the environment." Indeed the humanitarian, community and environmental emphases in the program helped the NGOs live with, and even appreciate, the top-down and authoritarian way in which the government expediated the program. After all, it was "obvious" that something had to be done and that the peasants were not doing it on their own. The scale of the reclamation program and the central role NGO's played in its implementation also meant that there were considerable organizational and financial rewards for participation.

The Ethiopian regime was hard-pressed on a number of fronts at the time of the famine. Per capita food production had been falling. The costs of the protracted civil war in the north were mounting. The regime needed food aid so that it would be able to feed the army, keep the urban population from becoming restive and bolster its legitimacy in rural areas. The Soviet Union, on which the regime depended for arms, could not supply significant food aid or economic assistance, while the Western powers, which were in a position to help in these areas, were reluctant to do so in ways that would support the war effort for ideological and strategic reasons. Like the Western donors, the Ethiopian regime needed a common definition of the problem, a rationale for a massive food aid program that could be conceived in narrowly technical terms and provide the basis for close cooperation.

The program's technical components made sense to Ethiopian and expatriate experts and bureaucrats because they represented the vast expansion of a set of assumptions and an approach to soil conservation with which they were already familiar. Terracing and afforestation had been first undertaken in what was then the province of Eritrea, with the support of USAID, in the late 1960s. After the 1972–74 famine, conservation efforts were increased in Tigray and Wallo. From the mid-1970s on, soil conservation was supported by the World Food Program (WFP), initially involving only physical measures In the early 1980s when the WFP first supported environmental rehabilitation programs on a large scale, the emphasis was still on stone and earth structures.

The program's top-down approach seemed reasonable to ministry officials and urban dwellers who traditionally have had rather negative stereotypes about peasant agriculture, intelligence and ingenuity. Farmers' reluctance to accept new practices is often attributed to their traditional attitudes, rather than their socioeconomic circumstances. For example, the fragmentation of household landholdings is attributed to inheritance rules rather than the peasant's desire to diversify his farming enterprise and reduce his risks.[6] The strengths of indigenous farming and environmental management systems are overlooked. Indeed, even when visible they are often not "seen."

The top-down approach also fit well with the regime's political approach to rural development, which emphasized radical social and economic transformation, communal rather than individual incentives and crash mobilization programs. It was an approach that assumed peasants did not know what was good for them and would not necessarily participate in bringing about change without political agitation, education and, if necessary, coercion.

In sum, the environmental narrative, its corollary or supporting narratives, the technical package of bunds, terraces, woodlots and closures, and the top-down, mobilization crash program approach to implementation made sense to all of the key actors except, perhaps, to the peasants, who were not asked. They, too, proved willing to go along with the program, and, at times, to agree with the narrative because they appreciated the grains and edible oils they received at well over market wage rates and because they had learned that it was politic to agree with official views.

(c) *Problems with the narrative and the paradigm for action*

There is little doubt that the population of Ethiopia is increasing at over 2.5% per year, that many Ethiopians are poor, hungry and vulnerable to famine, and that soil erosion is a serious problem in many highland areas. What is in question is whether the neo-Malthusian environmental degradation paradigm provides an adequate framework for understanding the genesis of these phenomena, their causal interrelations, or what should be done to alleviate them. To anticipate, I will argue that there are major difficulties with the narrative and its supporting "data stories." They misrepresent what has happened, often exaggerating the rate of degradation and the ways in which human activity is causing it. They preclude the examination of alternative hypotheses based on the experience of other countries and inhibit scientific inquiry. They have contributed to a massive investment of funds, time and effort in activities that have at best had a marginal beneficial impact.

(i) *Difficulties with the Ethiopian data*

Famine is not a new phenomenon in Ethiopia. It was first recorded in the ninth century, and 10 major famines occurred within the two centuries following the expulsion of Muslim invaders in 1540. The great famine of 1888–89 caused widespread death and

devastation. More localized but no less lethal famines occurred in 1916–1920, 1927–28, and 1934–35. This recurring pattern of famine in itself calls into question the narrative that attributes it primarily to recent environmental decline.

There are also a number of difficulties with the thesis that the deforestation of the highland plateau has played a major role in recent environmental degradation and famine. A careful review of historical sources reveals no significant change in tree cover in the northern highland landscape of over the past century and a half, though there has been a decline in natural forest in some of the canyons that dissect the plateau.[7] The loss of natural forest, which is serious though overstated, has occurred in the southern half of the country, while the denuded hillsides and barren landscapes in the narrative are found only in the northern regions, where the FAO report locates the "frontier of serious degradation."

Another difficulty with the loss of tree cover thesis is that on much of the northern plateau eucalyptus trees have been integrated into the farming system since they were introduced in the last decades of the 19th century. In much of the north it is hard to find a homestead that lacks a stand of these trees and does not use them for construction and a part of its fuel needs. In the past two decades an imported species of juniper and bamboo have also been extensively planted around house sites in Dega Damot, Gojjam where I conducted research in the early 1960s. Indeed, when I went back to the district after almost two decades, what struck me most vividly was the increase in tree cover on the farmed high plateau. The increase of tree cover with population pressure is not surprising and has been observed in Kenya (Shipton, 1989).

The fact that trees have been integrated into highland farming systems spontaneously without government extension programs calls into question the narrative that says peasants lack the ability or foresight to plant trees without environmental education, training, and access to subsidized seedlings from nurseries. Ironically, the surge in concern with fuelwood as a national issue can be traced back to the mid-1970s, when peri-urban plantations of eucalyptus declined sharply shortly after they were nationalized by the Derg. A great increase in tree planting on individually controlled land was noted by NGO workers in central and southern Ethiopia in 1990–91, immediately after the Derg abandoned key features of the agrarian reform program and relaxed controls on the private sector.

There are several problems with the dung-burning thesis. Burning dung is not a new practice. McCann's historical study of agriculture in Ethiopia finds that it was done in the same areas as today in the 19th century. This casts doubts on the fuelwood shortage theory of increased dung use. Dung is a preferred fuel for certain types of cooking. It is often used for fuel even by better-off farmers who have access to fuel wood, because of its combustive properties and because it is cheaper (Pankhurst, 1992, pp. 90–96). The nitrogen loss due to using dung as a fuel instead of spreading it on farmland may well also be overestimated, as the nitrogen in dung is very volatile. Nor does burning dung as a domestic fuel lead to its complete loss as a fertilizer, for burning lowers the Ph and concentrates any phosphorous present. Ashes from the homestead are invariably spread on the garden and adjacent fields. Indeed, in many of the areas that are heavily dung dependent for fuel, farmers also pile up and burn sod prior to planting their crops, apparently for the same reasons.

Widely accepted estimates of the reduction in crop yields caused by erosion and biological degradation (a decline in organic matter), such as those of the FAO 1984 report, are almost certainly much too high. A recent reanalysis of the data by Peter Sutcliffe, former Senior Technical Advisor to the National Conservation Secretariat in Ethiopia, indicates that loss of crop yield estimates are from 10 to 15 times too high (Sutcliffe, personal communication). Overestimation of losses in production due to soil erosion are commonplace in Africa, due in part to methodological problems (Stocking, 1994). In the last analysis, the data on soil erosion and nutrient loss in Ethiopia are quite thin.

The policy implications of these difficulties in the data cited to support the environmental degradation narrative of famine in Ethiopia are in urgent need of revaluation.

(ii) *Question not asked*

The influence of the narrative has largely prevented planners from examining counternarratives or alternative explanations of Ethiopia's environmental and food security problems and from adequately testing, reclamation technologies and approaches.

The neo-Malthusian narrative's denigration of indigeneous agriculture has led experts and planners to overlook and filter out much information about the strengths of indigenous resource management practices. There is virtually no mention of the fact that agro-forestry is almost universal in highland farming systems. There is little discussion of indigenous techniques of soil amendment, including manuring, spreading ashes from manure which has been burned, and the use of leguminous crops in rotation, except for the occasional claim that these practices are dying out. There is little discussion or even acknowledgement of indigeneous terracing, which is extensive is some areas, or of indigenous run-off ponds, or irrigation. Densely settled areas in the southwest are always said to be at environmental risk, with no investigation of the distinctive farming systems that appear, in some cases, to have sustained such densities for centuries.

Equally damaging, the neo-Malthusian narrative rests on an essentially undynamic view of peasant behavior, one in which it is only possible to make linear projections of the rate at which Ethiopia is heading toward environmental collapse. What planners need to know is under what circumstances peasants do and do not use the resource management techniques of which they are aware, so that policies and investments can help to make these circumstances more common. What, for example, were the effects of the traditional political and economic organization of the empire? What were the effects of the changes in the political economy brought about by Imperial regime in the 20th century?[8] What were the effects of the Derg's program of agrarian reform, limitations on the private grain trade and restrictions on population moment? What were the effects of years of mobilization for war? How did all of these changes affect particular groups of rural Ethiopians' incentives to manage the environment and their access to food?

Asking these kinds of questions would focus attention beyond the physical processes taking place on the land and broaden our inquiry to include questions about transportation, marketing and trade, about food processing and storage, about land tenure and land markets and about the relationships of many of these factors to demographic issues and family planning.

In comparative terms, a major problem with the dominant narrative is that it does not account for long-term developments in other parts of the world, including China, India, Indonesia, Japan, and Europe, where agricultural intensification rather than environmental collapse has been the norm. Nor does it take account of or explain the dynamic interrelations of environment and development in other parts of Africa, including Kenya, where recent research indicates that increasing population densities do not inevitably lead to environmental degradation, increased poverty or food insecurity (Tiffen, Mortimore and Gichuki, 1994). Based on such comparative cases, one could develop a counternarrative that would "explain" Ethiopia's environmental crisis in terms of a failure to intensify, resulting from political insecurity and bad policy, or alternatively from too little infrastructure and capitalism.

(d) *Investment in untested technologies*

From a practical standpoint, the worst thing about the neo-Malthusian narrative is that it fostered a major investment in technologies and activities that did little to address environmental degradation or farmers' needs. The technology — bunding and terracing, hillside closure, and tree planting — had all been used, but its effectiveness had not been evaluated under diverse on-farm conditions. Indeed, it is striking that there were virtually no on-farm studies of the production, economic or environmental effects of the packages promoted in any of Ethiopia's diverse agro-ecological zones.

A major project of research and experimentation in soil conservation measures at seven stations in different agro-ecological zones was undertaken in 1981.[9] After it was discovered that farmers did not find the physical conservation works attractive, additional social and economic research was undertaken. In 1991 it became clear that production on control plots was significantly higher under most crops and conditions than it was under any of the conservation measures (Herweg, 1992). In other words, contrary to expert opinion and to what the extension agents had been telling farmers, the measures lowered production, income and food security. The main contributing factors were: 10–20% of the fields of the area, even more on steep slopes, was occupied by the conservation structures; waterlogging; rodents whose habitat is normally destroyed by plowing, but live in the structures; weeds; and difficulty of plowing and threshing in narrow spaces (Herweg, nd, pp. 11–12).

The decision by all parties to move ahead was based on certainty that the explanatory model of degradation was correct, that the peasants were unable and unwilling to take action without outside support and that they had no indigenous knowledge or techniques for managing their environment that were worth taking into account. Based on these assumptions, donor willingness to implement the reclamation program and let the government spearhead the effort, using its top-down and authoritarian approach to rural development and administration, seemed to make sense. After all, "the problem was urgent." It was obvious what had to be done and done quickly. There was no time to wait for time-consuming research. In retrospect, all these assumptions are questionable.

(e) *Implementation*

In the wake of the famine, existing government reclamation programs were greatly expanded. Activities on peasant lands were organized by the Community Forestry and Soil Conservation Development Department of the Ministry of Agriculture, which was responsible for all food-for-work programs. The effort was supported by the World Food Program's Project 2488, the European Economic Committee (EEC), and US donations of grain and edible oils. Other donors provided technical equipment and tools. NGOs played a major role in implementation, each being assigned to a particular geographic location.

Project sites were selected by extension workers from the Ministry of Agriculture. The peasants were organized in large work teams to do the actual digging, pitting and planting. Generally this was done by con-

tracting with an individual who was responsible for hiring the workers and making sure the work was done on a particular section of the project. The peasants contracted for the job were entitled to a daily payment of 2–3 kilograms in wheat and 120 grams of edible oil to be delivered each month on the basis of the project work completed.

The program grew rapidly to become the second largest food-for-work program in the world and the largest in Africa. At its height the program was active in nine regions and provided 100,000 metric tons of food to up to 800,000 people. By the beginning of 1990 the peasants had constructed more than one million kilometers of bunds on farm land and had terraced almost half a million kilometers of hillside. In addition, 80,000 hectares of hillside had been enclosed and it was claimed that 300,000 hectares had been planted to tree. (Ståhl, 1990, p. 5). Hundreds of tree nurseries had been established with the capacity to produce an astounding 100,000,000 seedlings per year.

(f) *Technical and institutional problems and learning*

During 1985–90, when Mengistu announced far-reaching reforms and moved away from socialist agriculture, the reclamation program encountered a number of difficulties and was increasingly criticized by members of the NGO community and experts in the Ministry of Agriculture. Many critics complained about the way in which the program had been implemented. Some found fault with various components of the package. Few questioned the validity or adequacy of the underlying environmental narrative.

The program encountered logistical problems, delays in payment of six months or more, diversions of food stuffs, and rent-seeking by crew foremen. In some instances it proved difficult to target the food-for-work program on the poorest families, as they were not able to pay gratuities up front to secure employment on the work teams. Such problems were hardly surprising, in view of the scale of the program.

In their eagerness to expand their programs and dispense food stocks, donors and NGOs were not always able to ensure that their activities focused on localities that were experiencing unusual food deficits or environmental problems. Indeed, in reading project design documents, one is struck by the fact that the environmental degradation narrative was mapped onto the local landscape to justify uniformly the need for food and conservation work.

There were the usual fears that the food payments would depress producer prices and incentives for production. Several studies failed to find evidence that the program had these negative impacts, though they were not conclusive and there were strong institutional pressures on the consultants who carried them out.

By the end of the decade, experience and evaluations had revealed a number of more fundamental technical and organizational problems with the rehabilitation activities. An impact evaluation carried for the World Food Program and the Ministry of Agriculture reported mixed views among peasants (Yeraswork, 1988). Many said they liked the soil bunds which retained soil and moisture. Most complained that the stone bunds and terraces reduced arable land and harbored rodents. Some peasants complained that terracing reduced yields by raising subsoil to the surface, making it hard to plow, and reducing field size. Some peasants complained bitterly that the terraces and *fanyaju*, a special type of terrace designed to channel run-off, increased problems of soil erosion. Their complaints were generally ignored by local authorities. These, of course, were precisely the problem later identified by the Soil Conservation Research Project on its experimental research stations.

Hillside closures generally achieved impressive results in terms of vegetative regeneration, but species unpalatable to livestock and trees tended to dominate fodder grasses. This intensified destructive grazing on hillsides adjacent to enclosures (Fruhling, 1988; Hultin, 1988).

Community forestry was not popular or, in the long run, successful. In areas of land hunger farmers resented setting aside land for community forestry. In areas of the south where naturally occurring trees were still abundant, farmers could see little point in planting trees. Where woodlots were planted farmers often complained that the trees reduced agricultural production through shading, root interference and attracting anti-crop wildlife, such as birds (CRDA, 1990a, p. 6). It was also unclear who would benefit from the woodlots, which were viewed by the peasants as belonging to the NGOs or the state. Nor did their experience lead them to believe otherwise, as they had to get permission from ministry officials to harvest their trees. It is not surprising, then, that tree lots were not tended or guarded well, that sapling survival rates were low, and that farmers generally refused to work on community forestry or other rehabilitation activities without continuing payments in food.

The NGO community in two frank reports was highly critical of the program's authoritarian approach, the lack of peasant participation, neglect of indigenous knowledge and failure to take account of local ecological variation (CRDA, 1990a, 1990b).

The magnitude of farmer displeasure with community woodlots and many other communal aspects of government policy was brought out clearly in the events that followed a speech by Mengistu Haile Mariam in March 1990. The speech was widely interpreted by farmers to mean that they were free to dissolve production cooperatives, repossess their former lands, live where they pleased and generally ignore the more onerous aspects of the agrarian reform program.

In the weeks and months that followed there were widespread reports of farmers cutting trees and uprooting seedlings for a variety of reasons, including the desire to reclaim land lost to production cooperatives, community woodlots and major reforestation projects; the desire to expand land under production or to reduce the negative effect of trees on adjacent fields; and the belief that by clearing and cultivating land they might establish a claim to long-term use or ownership.[10]

In the last analysis, only a small part of the degraded highlands near the roads had been "rehabilitated," and, even in these areas, activities which farmers considered useful, such as soil bunding, did not appear to be sustainable. Farmers appreciated the food but were not willing to sustain the effort on their own initiative.

After 1990, as the Ethiopian regime began to loosen its grip and then crumble, critics began to complain openly about the top-down approach to the program. Participants at an NGO-sponsored workshop on community forestry held in October 1990 noted that many of the programs' apparently technical problems were in reality related to the rehabilitation programs' reliance on government-imposed institutions and their leaders. They pointed out that small farmers generally were not involved in identifying their needs and problems, establishing priorities, evaluating alternative solutions or planning how they were to be implemented. As a result, indigenous farming systems, technical knowledge, and common property institutions were ignored, and farmer incentives for participating in community forestry projects were poor (CRDA, 1990a, 1990b).

6. EPILOGUE

In May 1991 rebels from Tigray toppled the Derg, occupied Addis Ababa and formed a new Transitional Government of Ethiopia (TGE). The new government espoused a policy of ethnic self-determination and decentralization. It has subsequently introduced formal changes in administration and governance to implement these policies, but these have been countered, to a large extent, by the reemergence of a one-party state under the stewardship of the Tigrean dominated Ethiopian People's Revolutionary Democratic Front (EPRDF).

The new regime remains committed to addressing environmental problems. While it is considered pro-peasant and stresses the importance of local people's "participation" in all its programs, it is not clear to what extent it has escaped old orthodoxies. In its home area, Tigray, where it enjoys great popular support, it has actively promoted terracing and reforestation projects by mobilizing local peasant associations. In the rest of the country, where governance has been weak, the reclamation program has stagnated. The regime has not been eager to pursue unpopular programs, not even the collection of rural taxes.

The regime also maintained the previous government's commitment to preparing a National Conservation Strategy (NCS) with the assistance of the International Union for the Conservation of Nature (IUCN). The changes they introduced into the process by which this was done and the way the process eventually played itself out are instructive. For despite a conscious effort to obtain peasant knowledge, the environmental policy narrative still exerts a strong influence over thinking about environmental management.

Work for the first phase of the NCS was carried out through two missions in 1989 and the Phase I report was completed in March 1990. When the second phase of NCS planning was initiated later that year, it was envisaged that, following a conference attended by experts and officials from relevant ministries, the secretariat would spend approximately 12 months drafting the strategy. It was only late in 1991, after the establishment of the TGE, that it was decided to take a bottom-up and decentralized regional approach. This approach fit with the new regime's policy and with the expatriate advisor's belief that such a bottom-up and participatory procedure would enable the NCS to tap peasants ideas and practices concerning environmental problems and management.

It was anticipated that in each region work would be undertaken in four stages: stocktaking and assessment of resources; identification of key resource issues, problems and potentials and framework development; a regional conference to aggregate subregional findings and develop a regional strategy; and the preparation of an action plan and investment plan. It was only after these stages had been completed in the regions that the national plan was to be drawn up, using the regional plans, studies conducted by members of the secretariat, and any additional studies available in the process. As things turned out, there were many logistic difficulties in conducting the regional and local assessments. Peasant input into the process was nominal at best. In the end, the secretariat was pressured to complete the NCS for an international seminar before any of the regions had completed their strategies.

A careful reading of the voluminous zonal assessments that were produced as a part of the NCS exercise is instructive. It indicates that negative views of peasant agriculture held by local task force members filtered out much information about the strengths of indigenous resource management practices, even though this was explicitly called for in the guidelines developed by the secretariat. There is, for example, virtually no mention of indigenous agro-forestry. There is little discussion of indigenous techniques of soil amendment. There is little discussion or even

acknowledgement of indigenous terracing or of indigenous run-off ponds, or irrigation. Densely settled areas in the southwest are said to be at environmental risk because of population pressure with no investigation of the distinctive farming systems that appear until recently to have sustained such densities for centuries. Similar gaps in regard to the strength of indigenous practice are embedded in some of the reports done by experts for the Ethiopian Forestry Action Plan (EFAP), an ambitious and in many ways excellent planning effort was that folded into the NCS. Perhaps the most striking example of this in the EFAP is the estimation of a wood fuel deficit based on estimates that do not include the major source of peasants' wood fuel, on-farm agro-forestry. In sum, ideas and "facts" from the old narrative were used uncritically, while new information and alternative understandings were ruled out.

7. CONCLUSIONS

Overreliance on environmental narratives of one type or another is hardly confined to Ethiopia. Many examples from the colonial era are given in Anderson and Grove's edited volume, *Conservation in Africa* (1987). Showers, a soil scientist, has carefully documented the way that colonial officials made use of an inappropriate narrative as the basis of a program that greatly exacerbated soil erosion (Showers, 1989). Tiffen, Mortimer and Gichuki's interdisciplinary, historical study of Machakos district in Kenya shows how population increase over more than 40 years led, in the end, to less soil erosion, despite continuing expert statements to the contrary. Leach and Fairhead describe how a policy narrative about the interaction of people and forests in Guinea misrepresented both forests trends and the role of human action and lead to a series of inappropriate governmental actions from the 1930s up to the present (Leach and Fairhead, 1993, 1994; Fairhead and Leach, this issue).

The case of the Ethiopian reclamation narrative and crash program implemented during 1985–90 indicates that the paradigm problem is still with us. Indeed, I have argued that it is an expectable result of the way narratives and paradigms are used in planning for development and environment in Africa. It is clear, however, that their use causes more difficulties under some conditions than others.

What can be said of these conditions? The Ethiopian case suggests that the power of a development narrative varies with the context in which it is used. Generally, it is enhanced when: (a) donor experts and their domestic constituencies are strongly attached to them; (b) there is political, strategic or moral pressure on donors to act quickly; (c) there has been little technical and socioeconomic research, and there is a weak data base on the problem in the recipient nation; (d) the recipient country must rely heavily on expatriate experts for advice; (e) the recipient government is dependent on foreign assistance; and (f) the recipient government, being weak or authoritarian or both, does not have the institutional capacity to hear and learn from its rural people. A preliminary review of other material suggest that these generalizations may help us to understand similar situations in other countries.

NOTES

1. Hirschman argued from his case studies that, as unanticipated problems emerge and are overcome, new institutional capacities are developed. Through a process of experimentation and learning the original assumptions are discarded. The experience of the past quarter century shows that this learning process often has not occurred. Instead, projects have been sustained and widely replicated with little regard for their success. I have discussed some of the reasons for this elsewhere (Hoben, 1980, 1989).

2. The role of cultural paradigms in development planning is discussed at greater lengths in Hoben (1980, 1989 and 1994).

3. For a balanced discussion of Ethiopia's natural resource base and trends in resource use, see IUCN (1990), pp. 8–28.

4. For a discussion of Northern Ethiopian land tenure systems, see Hoben (1972), Bauer (1977), and Bruce (1976).

5. For a balanced account of the land reform program, see Dessalegn Rahmato (1985).

6. For a discussion of reasons for fragmentation, see Bruce, Hoben and Rahmoto (1994), pp. 28–29.

7. For an excellent discussion of agricultural history in northern Ethiopia, see McCann (1995), Chapter 4.

8. For an excellent analysis of the linkages between changing government policy, environmental management, food and population movement in the first half of the present century, see McCann (1987).

9. The Soil Conservation Research Project was carried out with Swiss funding and technical support from the University of Berne. Its methodology is described in Herweg and Grunder (1991).

10. This information was gathered through field trips and interviews with researchers from Addis Ababa University, representatives of the Ministry of Agriculture, NGOs and major donor organizations active in environmental rehabilitation programs.

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