

Improving Traditional Grassland Agriculture in Sudan*

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Grasslands, including acacia-scrub semidesert and low-woodland savanna, cover two-thirds of Sudan, or approximately 600,000 square miles. This domain stretches from the Sahara on the north to the high-woodland savannas and Nilotic flood region on the south, from Chad on the west to Ethiopia and the Red Sea on the east. During the more than 50 years of their rule in Sudan, the British were content to maintain civil order in this region. They did not attempt any basic change in the economies of the nomadic and settled tribes who lived far from Khartoum.

When Sudan became independent in the mid-1950s, however, the leaders of the new government saw a poor country whose grasslands had immense potential for development. Eager to spur economic growth, the Sudanese minister of agriculture in the 1954 transitional government asked the United Nations to provide experts from the Food and Agriculture Organization (FAO). Their arrival set in motion a chain of events for agricultural development in the grasslands that daily grows more complex.

The work of those early experts and all but the most recent of their successors has been nearly forgotten, even to development practitioners in Sudan. Few things, it seems, fade from memory faster than a development project whose funding has ceased. Yet new projects begin every year. Designed almost without regard to what has gone before, they often repeat the errors of the past. A critical history of almost a half-century of efforts to improve Sudanese grassland agriculture may therefore be useful both to current workers in Sudan and to anyone broadly interested in the perils of planning.

Origins of Grassland Development

The primary task assigned to the FAO experts in 1954 was to develop policies to check overgrazing, a problem recognized by the British. In 1944 they had established a Soil Conservation Committee that recommended forest plantings on the outskirts of settlements, along with the hillside terracing and stabilization of active dunes. The chief accomplishment of the committee, however, was the establishment of a Soil Conservation Service dedicated not to constructing terraces or plantings but to excavating hundreds of ponds in the clay plains that cover much of central Sudan. The development of water resources, it was thought, would spread the burden of livestock over a wider area and in this way reduce overgrazing.

This approach could work only if livestock populations were stabilized. The government planned to do that by providing no more water than the ranges

could support, but the soil-conservation advisor admitted in 1954 that he lacked the staff to do the careful planning this required. Uncontrolled by the government, the livestock population began to rise steeply. In the 25 years after 1917, the numbers of cattle, goats, sheep, and camels in Sudan increased from 3.5 million to about 13 million; in the last decade of British rule, the expansion rate more than doubled to a total of approximately 21 million. Part of that explosive growth may be explained by the decision of the British in 1947 to begin a huge campaign vaccinating cattle against rinderpest, the most serious of the cattle diseases in Sudan. By 1953 a million inoculations were being given annually.

Sales of livestock might have increased to match these numbers, but markets were slow to develop, especially since European quarantine regulations made it impossible for Sudan to export meat directly from livestock-producing areas. The inevitable result was overgrazing, not only in the traditional grazing grounds but also in the new areas opened by the Soil Conservation Service.

An official reconnaissance of grazing resources was conducted in 1955, and it recorded the absence of the choicest forage on the Butana, the plain between the Blue Nile and the Atbara River. M.N. Harrison, the author of that reconnaissance, in striking contrast with much later writing on Sudanese nomadism, did not advocate nomad settlement as a means of checking overgrazing. On the contrary, Harrison admired so-called seasonal migration and considered it the only way, for the time being, that large areas of Sudan could be grazed, because some were too dry in winter and others were too muddy and plagued by biting flies in summer. He noted that the annual movement of nomadic livestock had an elegant symmetry, with one set of elongated north-south ovals traced by migrating cattle and another followed by sheep, goats, and camels. Each year, flies and mud in the Bahr el Arab forced cattle northward to pastures vacated by camels, sheep, and goats that had moved into far northern ranges. A few months later, the cattle shifted south and once again yielded their summer grounds to returning herds of camels, sheep, and goats.

In recent years, drought and overgrazing, expansion of cultivated areas, and civil unrest have disrupted much of this interlocking movement. Yet the main point of the 1955 report—that only nomads can use much of the area—is still true, and Harrison's recommendations for improving nomadism remain valid. The government probably could not reduce the existing livestock population; nor could it combat flies or make the ranges of the Bahr el Arab usable throughout the year. Harrison instead recommended the development of a dense pattern of shallow wells that would be cheap, would open unused areas, and would yield small enough quantities of water that large herds would not be drawn to them. In theory the Soil Conservation Service followed the same line of reasoning, but Harrison took the argument several steps further. First, because most of the Sudan's annual grass was lost each year in dry-season

fires, Harrison called for the development of firelines, mechanically or chemically blazed. Second, he stressed the importance of dividing the land around wells into pastures that would be rested and subjected to controlled grazing in alternate years. Fences were uneconomic, and rotational grazing would have to be managed by careful herders. For this to work, the range had to be allocated and registered to tribal owners. This final recommendation was crucial, because until individuals or groups knew that the benefits of new or improved ranges would be theirs, all efforts to develop rotational grazing would fail. Although Harrison proposed these recommendations in the mid-1950s, Sudan has yet to find anything better.

Land-use Planning

The FAO experts who arrived in the newly independent Sudan no doubt read the 1955 report and appreciated the risks of unplanned water development. Perhaps that is why they soon recommended that the Soil Conservation Service be renamed the Department of Land Use and Rural Water Development. The change augured well, but by 1959 it was clear that the department was not fulfilling its mission. One FAO expert wrote bluntly that "there is no point" in providing water for uncontrolled pastures and expressed deep concern about "the final consequences" if planning did not precede water development. That warning, and others, went unheeded.

By 1960 there were 470 ponds on the clay plains. In sandy areas too pervious to hold water, diesel-driven pumps lifted water from drilled bore-holes; 700 "wateryards" were built between 1953 and 1960, each with storage tanks, watering troughs, and taps for domestic use. Drawing on funds donated by Sweden, Great Britain, Egypt, Yugoslavia, Czechoslovakia, and Italy, the Sudanese government launched three annual "anti-thirst campaigns" between 1966 and 1968. Between them, these campaigns produced more than 1,000 shallow wells, equipped almost 500 new wateryards, and excavated another 100 ponds. The Department of Land Use and Rural Water Development, in a significant reorganization, was split in 1965 into a Rural Water Development Corporation, which is still an important agency, and a Department of Soil Conservation and Land Use, which after a steep decline is currently inactive. The land-use battle was lost.

Until 1974, FAO remained the one strong voice speaking in Sudan against unplanned water development. The agency undertook a series of projects to demonstrate the value of land-use planning. In 1958, for example, it supported a program of grassland improvement and pasture development that included fencing 250,000 acres at Ghazala Gawazat, east of Nyala. That project, the first one for range improvement in Sudan, unfortunately assumed that fencing was sufficient to exclude livestock. Without community support, of course, the fences were soon and permanently breached. Five years later, another FAO expert proposed ten nomad-settlement ranches, and in 1968 a reduced

program of five such ranches was actually begun. Four were near a grossly underused dried-milk plant built by the Soviet Union at Babanusa, near El Muglad; one was farther north. None were successful. In the case of the northern ranch, the families to whom grazing rights had been assigned overstocked the paddocks tenfold, and the livestock of envious neighboring tribes also finally had to be admitted.

In 1962 a much bigger project was started by the FAO Special Fund, the unit of FAO that became the United Nations Development Program (UNDP) in 1966. The Special Fund project had two objectives: first, to bring water to sandy places where boreholes failed and, second, to introduce improved crop, range, and fallows management as part of a comprehensive land-use plan. This project focused on the neighborhood of El Obeid in Kordofan. Nomads were already settling spontaneously there, in part because water development made it possible. Many areas remained unsettled, however, either because water could not be found or because non-cracking clay soils were too hard for traditional cultivation. The Special Fund conducted an immense, four-year study whose results were intended to be applicable not only to Kordofan but also westward across Africa to the coast of Senegal.

The final report was extraordinarily weak on issues of economics, equitable access to resources, and land tenure. On the question of water supply, for example, cost was almost entirely ignored in the proposed construction of more than 1,000 underground tanks. The non-cracking clays were meanwhile judged as unsuited to smallholder settlement, because the project staff believed that their cultivation required "rehabilitation" with tractor-drawn chisel plows. The report therefore proposed mechanized farms of 1,000 acres; the government was to plow the fields and sow pasture grass for a number of years before leasing the farms for cultivation. The study also recommended the creation of three pilot ranches, each a square six kilometers on a side. The ranches would be cut into fenced quarters, which would be grazed rotationally after the land had been cleared, deep-plowed, and sown to improved grasses. A barrier fence 300 kilometers long would stand at the southern rim of the study area, with gates to control migrating stock. If the pilot ranches were successful, the fence itself could serve as one edge of a set of additional ranches. None of these recommendations were implemented. Neither the tanks nor the mechanized farms could ever be economically justified, and there was no reason to believe that the ranches would be more successful than previous FAO attempts to fence Sudan's ranges.

The Special Fund report made a fourth recommendation, however, and under other sponsorship this one was put into practice. The recommendation was that nine model villages should be established on uninhabited sands. The villages would have been modeled on the traditional Sudanese bush fallow on sandy soils. In this system, millet and peanuts are grown for about four years on a plot that is then retired for 15 years to a crop of acacias tapped by farmers for

gum arabic, historically the principal export of western Sudan. Each model village was to be assigned a block of land six kilometers square, much like the proposed ranches. In this case, however, 90 families, each holding approximately 60 acres, would grow fifteen acres of millet, sesame, and peanuts on a field cultivated for four years. The field would then be retired to acacia for 16 years. Each family would annually bring four acres back into cultivation and plant 1,000 acacias on the plots being retired. The fenced periphery of the block, rimmed with neem trees, would be grazed by livestock, whose numbers would be strictly controlled.

Though presented as an original idea, the proposed model villages actually revived a suggestion that had been advanced twice during the last years of British rule, first in 1944 by the Soil Conservation Committee and then a decade later by F. P. Stebbing, a forester with long experience in India. Nothing had come of either proposal, and the model settlements proposed by the Special Fund study were at first similarly ignored.

Between 1969 and 1974, however, the UNDP sponsored a very similar project elsewhere in Kordofan and farther west in Darfur. Known as the Savanna Development Project, it had three objectives that built directly on the Special Fund study. It sought to reclaim one clay area for ranching, to reclaim another for mechanized farming, and to establish a model settlement on sand. The achievements of the project, however, were minimal. One knowledgeable observer, Martin Adam, wrote that the project "was staffed by diverse 'experts' who failed to get along with each other and faced numerous logistic problems." The experimental ranch, for example, was combined with one of the four pilot ranches that the government had begun near Babanusa in 1968. Under the plan, 24,000 acres of interspersed sands and clays would be seeded with introduced grasses and then grazed seasonally: the higher sands in the wet season, and the lower clays in the dry. Water would come from subsurface dams instead of from livestock-concentrating wateryards; nomads would instead use boreholes drilled on adjoining lands. The project had its innovative aspects, but nothing was done beyond reseeding, water development, and initial stocking.

Work on the farm on clay went further, as giant discs and chisel plows ripped 1,500 acres of clay plains at Bano, near El Obeid. The exercise brought no increase in sorghum production, because the clay sealed itself with the first heavy rain and remained impermeable as ever. The best results came instead from planting in furrows laid out on contour lines by a ridger; yields were 50% higher than those from uncontoured, unridged plots of sorghum, sesame, and peanuts. Apparently the site was later abandoned; in any case, the record of experiments ceased with the final project document in 1974.

The sand settlement was at Khamsat, 30 miles east of El Daem, in Darfur. Here 24,000 acres were subdivided into 100-acre farms for assignment to 240

families. Each family would cultivate four 6-acre plots, with two in millet, one in peanuts, and one in a crop of their choice. After four years, the fields would be replanted to acacia for the following 16. Almost 9,000 peripheral acres were reserved for the exclusive grazing use of the villagers' livestock. Work on the settlement, however, went no further than putting in a wateryard. FAO and UNDP subsequently turned their attention away from land-use planning in Sudan. They did not return to the theme until 1987.

The British took up where the United Nations left off. Returning to Sudan after several years of severed relations occasioned by Israel's Six-Day War, Great Britain funded four immense land-use studies in Sudan. Two concerned southern Darfur, one looked at the western slope of Jebel Marra, and the fourth considered the Nuba Mountains. The southern Darfur studies showed that nine-tenths of the population in the study areas had abandoned nomadism, although their animals often made a seasonal migration under the direction of a few family members or hired herders. So many people were looking for a bit of cropland that fallows were being reduced or eliminated. Yields were thus threatened, and conflicts with the remaining nomads were becoming more and more common as traditional ranges were taken over by cultivators. The situation, in short, was substantially the same as that encountered by the Special Fund study earlier in Kordofan.

The British also helped to implement the model-village proposal that had first been broached in 1944. In 1977, they joined with the World Bank and the Saudi Fund to support the Western Savannah Development Corporation. The project was canceled in the midst of a domestic financial crisis and begun again in 1981 on a reduced budget, with a foreign contribution of approximately \$17 million. In 1985 a second phase started; the World Bank, Britain, and the International Fund for Agricultural Development contributed almost \$30 million.

Headquartered in Nyala and working in a large area mostly south of that town, the savannah corporation continues to function. Some of its work derives directly from the old FAO projects. It has worked, for example, to see if mechanized plowing on clay soils can be adapted to smallholders. On the pilot-settlement side, it has established several new villages on sand. Each has had room for several hundred families, to be given long leases to plots of nearby land. Much as the old models proposed, the plots have been designed for a 20-year rotation, with 16-year fallows and 4-year cultivation periods for fields covering almost 15 acres. The corporation also set out, however, to develop and disseminate new crop rotations and programs of applying phosphate fertilizers that it and the bank maintain are economic and that, in conjunction with rotation, may make fallows unnecessary. In that event, each family will be able to cultivate permanently a large fraction of its holdings; to that end, the corporation is seeking to develop donkey-drawn plows and weeding implements.

Meanwhile, the corporation has undertaken innovative range-management programs. Several villages have been allowed to fence pastures, to which they now enjoy exclusive grazing rights, in exchange for agreeing to keep livestock out of the enclosure during the wet season, when seed sets. A program has also begun for managing lands used by nomads. In one case, nearby sedentary farmers received exclusive dry-season rights to the land, while the nomads agree to recognize a division of the range into halves between which they will alternate from year to year. The community-based approach is remarkable; so is the absence of fencing for nomad-occupied lands, which are demarcated only with signal poles.

The success of both the settlement and range programs is a matter of debate. Although three new, slightly modified settlements were added in the second phase of the project, occupation of the first settlements proceeded very slowly, in part because promised schools and clinics were not rapidly established. Moreover, the settlers themselves were ethnically heterogeneous and potentially unstable as a community, and outsiders attracted by water supplies have located beyond the settlement perimeters. They pose a threat to the settler retention of leaseholds, especially of the fallows. Consultants have gone so far as to recommend that the settlements be terminated, and a corporation-staff member has called them poverty traps that consign settlers to subsistence agriculture. If viewpoints like these become accepted, a long-held faith in planned settlements for the Sudanese grasslands will come to an end.

The real test of the range experiments will come when the pastures are improved. At that point, livestock owners will be tempted to concentrate their herds on the improved areas. Unfortunately, the corporation has also fallen into the practice of providing water without simultaneously controlling land-use in the neighborhood of the well; it has paid for the rehabilitation of more than 150 boreholes that are now creating new examples of the problem that the corporation was conceived largely to solve.

Better livestock marketing would help, and to that end the World Bank lent \$25 million in 1978 for the development of unit trains to carry cattle from Nyala to Khartoum, along with an additional sum in 1984 to establish a new stock trail to help cattle make the long walk to Khartoum. Sudanese railroads, however, are almost out of service, and work on the stock trail is progressing slowly. A better hope for short-term range improvement could lie in the now-apparent decline of livestock populations, a result of degraded ranges, the collapse of veterinary services, and political insecurity.

Agricultural Research

Twenty years after the first foreign experts came to Sudan, aid agencies recognized that the improvement of grassland agriculture might require a long-

term commitment to research. The dramatic result was the creation of the Western Sudan Agricultural Research Project (WSARP) in 1978. The World Bank and the United States Agency for International Development (USAID) contributed \$30 million to the project, which had as its focus a commitment to research on farming systems. It was to be field based, undertaken in cooperation with farmers and livestock owners, and multidisciplinary, with as much attention to social and economic problems as to conventional agricultural science.

The origins of WSARP can be traced to the experience of USAID with two failed projects undertaken in 1974, when the United States restored diplomatic relations with Sudan. The first was the Abyei Project in southern Kordofan, which served a combination of southern Dinka and northern Arabs. This project enjoyed high-level support from the Sudanese government, which was eager to show that development projects could succeed along the uneasy line of contact between northerners and southerners. In 1981, after spending several million dollars, USAID terminated the Abyei Project because the Dinka wanted only mechanized cultivation and would not accept the alternatives offered, principally animal traction or pesticides and no-till cultivation.

The other USAID undertaking, upstream from Ed Damazin, the town at Roseires Dam, was the Blue Nile Integrated Rural Development Project. Envisioned as an experiment in research seeking "a viable systems approach to smallholder farms and livestock development which will be suitable for replication," this project provided extension and credit to 2,500 farmers, of whom 1,000 also received tractor services. It consumed approximately \$15 million. In 1983, when \$12 million had been committed, the project manager noted that the credit cooperatives were developing slowly, with acute repayment problems, and that the range-management division, charged with "organizing and modernizing pastoral activity," had "done little except to conduct a vaccination program."

By the time these projects began, AID realized not only that research was essential to developing Sudanese grassland agriculture but also that this research could not be done in the five years of a typical project. A 1977 study funded by the Ford Foundation offered the basis for a large-scale investment in research. The Ford study showed that agricultural research was dominated in Sudan by the Agricultural Research Corporation. Furthermore, it found that the 175 researchers of the corporation, two-thirds of whom held doctorates from American or British institutions, were strong on laboratory science but weak on fieldwork, strong on pure research but weak on applying it in rural communities. Drawing on the experience of the Ford Foundation in India and the Philippines, the study concluded that the corporation should replace disciplinary groupings with interdisciplinary teams, including social scientists, to address topics such as food grains, cotton, and water management. The study gave special emphasis to the need for research on rainfed agriculture, which had always been neglected by the corporation.

The World Bank joined AID in funding WSARP as a semiautonomous unit of the Agricultural Research Corporation. Four stations were to be established: two in Kordofan, at El Obeid and Kadugli, and two in Darfur, at El Fasher and Ghazala Gawazat, the station originally fenced by FAO in 1958. Although project funds were committed, the development of WSARP was painfully slow. After ten years the Darfur stations were still not operating. The Kadugli station, however, has now been functioning for several years, at first staffed by a handful of American scientists. Among the good things to come from it have been socioeconomic surveys of parts of Kordofan, important studies of intercropping legumes with grain, and initial plans for range management, with a proposal for cooperative programs with the regional government to introduce land planning in tandem with new boreholes to open ungrazed clay plains.

More recently WSARP has come under attack, in part because the work done there has become intellectually insular. Researchers seem less interested in cooperative field studies than in laboratory activities. The team responsible for evaluating the program in 1986 expressed surprise that plant breeders had ignored the scores of local varieties of sorghum and instead had used whatever seeds they could obtain from the corporation headquarters in the Gezira. The evaluation also observed that the WSARP livestock program had become focused on supplemental feeding with sesame cake during the dry season, a topic of more interest to animal nutritionists on the staff than to livestock owners.

Emergency Programs and Private-Sector Initiatives

For WSARP these criticisms could hardly have come at a worse time: Sudan was deep in a crisis induced by drought and by the fall of the seventeen-year Nimeiry regime. USAID decided to concentrate its funds on emergency relief. Rather than try to get WSARP back to its intended purpose, USAID began planning to cut off further support, except for sorghum and millet breeding, as early as 1984. The agency's agricultural programs shifted toward improved seeds and roads, rural credit, and water development. Land-use planning and research were almost completely discarded as USAID announced in 1984 that it would contribute \$60 million to the construction of a \$143 million paved highway from Kosti to El Obeid. The African Development Bank agreed to fund another \$40 million segment of this highway. In 1985 USAID sponsored an \$11 million program for a southern loop connecting to the trunk.

USAID was not alone in this reorientation. In 1980 the European Economic Community (EEC) had accepted primary responsibility for two area-development schemes in western Sudan. The smaller of the two, the Nuba Mountains Rural Development Project, aimed at improving traditional farming by introducing ox-drawn hoes, seeders, and ridgers. The plan recognized that farmers would be tempted to plow more land at the expense of their fallows

and suggested intercropping with acacia as one solution to the problem. Originally funded with approximately \$5 million from the EEC, the project developed slowly. Only about 2,000 comparatively wealthy farmers, 1 percent of the total for the project, had bought the implements when funding expired in 1986. The chief problem, predictably, was a doubling of the cultivated area at the expense of fallows. The project had been justified by assertions that animal traction would boost yields by helping farmers sow on time, establish large plant populations, and weed more thoroughly. In fact, yields did not rise, probably because fallows were being reduced. An evaluation of the project's first phase warned that the area was already overcropped and contended that research was needed on breeding, fertilizers, crop scheduling, and creation of a sustainable farming system. Yet in 1987, when the EEC budgeted \$14 million to fund a second phase of the project, there was no mention of research to create sustainable cropping systems.

A similar shift away from research occurred at the other EEC western project, the Jebel Marra Rural Development Project, in which the EEC has invested some \$25 million since 1980. Previous work in this area by FAO and several other groups had focused on irrigation, but that emphasis is now muted. Instead, the adaptive-research unit at the project is focused on improvement of traditional local methods of sorghum and millet production. Animal traction is an important component of this research, and the same problem of declining fallows is appearing here as in the Nuba Mountains project. When the first phase of the Jebel Marra project was evaluated in 1985, the chief criticism was that it gave insufficient attention to field-based, cooperative research.

The World Bank and UNDP, meanwhile, have jointly prepared an immense afforestation project. Tentative budgets in 1986 included a bank commitment of approximately \$60 million, a sum that was later chopped back to \$22 million. Although the bank remains committed to WSARP, the core of the afforestation project is tree planting, primarily by dissemination of seedlings to farmers. In the preliminary project documents there is no evidence of any attention to the crucial questions of land tenure or how the trees might be used in crop rotations. Even FAO, whose history in Sudan is longer than that of any other foreign agency, has succumbed to the new and impatient approach in its project to manage rangelands around the borehole at El Odaya, southwest of El Obeid. In relying on wholly uneconomic and finally useless barbed wire, it took a giant step backward from the progress made by the Western Savannah Development Corporation. Second-phase plans call for solar-powered electric fencing to be removed when live fencing has been established, but there is no reason to believe that such high-tech solutions will be any more permanent than the now-forgotten ranching experiments of the late 1960s. Other United Nations agencies are proceeding with equal disregard for the long-term consequences of their actions. For example, UNICEF is especially enthusiastic about rehabilitating boreholes but gives little attention to land-use planning around them.

The most promising element in this third phase of agricultural development for the Sudanese grasslands is the heavy emphasis by almost every developmental agency on local participation, although this often entrusted to nongovernmental organizations working as intermediaries between the donors and the Sudanese population. Most of these organizations came to Sudan to help with famine relief during the drought of 1984 and 1985. They then decided to stay in the country, subject to government approval and to continued funding not only from private donations but also from donors like USAID, for whom they often serve as implementing agents.

USAID has shown a very strong interest in working with nongovernmental organizations. Its involvement with them in Sudan began with relief activity, afforestation, and distribution of hybrid sorghum seed. The Kordofan feeder-road project, however, also provided grain warehouses for the Agricultural Bank of Sudan and nearly \$2 million for private organizations helping small farmers get credit from that bank. Enthusiastic about the activities of nongovernmental organizations in stimulating private-sector development, USAID proposed in 1986 to revise the Regional Finance and Planning Project, which would bring these organizations as USAID contractors into rural communities in Kordofan to help them obtain reasonably priced commercial services.

The appeal of these organizations that work closely with rural people has become so great that some principal donors have themselves begun acting like nongovernmental organizations. After turning away from land-use planning in 1974, UNDP spent the next decade on an assortment of projects designed primarily to strengthen a wide variety of government ministries. In 1987, however, it published its third country program for Sudan, and once again the focus was on rural development. Five districts were chosen as the sites for area-development schemes where United Nations volunteers would work with residents on improving crops and livestock, incomes, medical services, and water supplies. How these things will be accomplished is not explained in the project-identification document and is apparently to be determined largely on the spot by the volunteers.

Attractive as such programs may be in the short term, they run the risk of repeating the mistake of the early wave of developmental projects in Sudan. Responding to the need for water, in other words, they will contribute to the continued degradation of the surrounding land. Without effective land-use planning, it is difficult to avoid that result. The Ford Foundation has attempted to minimize the problem by providing funds for research and planning to nongovernmental organizations, but this type of assistance is essentially palliative. It cannot overcome the tendency of these groups to provide potpourris of services that are useful in a narrow sense and potentially

calamitous in a broad one. The foundation's involvement is simply too modest to bring about successful land-use planning or to sustain fundamental research.

The Nettle of Land Tenure

In fairness to the aid agencies, there is little point in putting money into programs whose achievements are as minimal as those supporting land-use planning and grassland research in Sudan. The proper response, however, is not to abandon these things but to determine why they have failed in the past and how they can be made to succeed in the future. In approaching that problem, one is quickly brought to the difficult subject of land tenure.

Although stabilizing land tenure is of the utmost importance both for implementing land-use plans and for providing an incentive for sustainable farming systems, almost no progress has been made in Sudan even with land registration, the first step in the process. The problem is worsening. Twenty years ago, stabilizing land tenure seemed manageable, because although land distant from the Nile River was rarely in registered private ownership, usufructary rights to most of it were recognized and administered by native authorities that often were well aware of the value of land-use planning.

The Unregistered Lands Act of 1971 essentially abolished the existing tenure structures by declaring unregistered lands to be governmental property. Other legislation at that time reassigned many powers of traditional native authorities to local councils, which in theory could zone unregistered lands, at least until 1983. The Civil Transactions Act, one of several Islamic laws passed that year, reverted to recognizing usufructary rights to unregistered lands, and with the fall of the Nimeiry regime in 1985 the powers of the native authorities were partially restored. The situation is confused because it is unclear whether the Civil Transactions Act has or has not been repealed. If it has not, the situation is theoretically as it was before 1971; if it has, unregistered lands remain governmental property, although the local governmental organizations that might plan their use no longer exist. Moreover, there are few legal experts to administer a registration program even if one is begun.

The instability of land tenure undermines the few continuing land-planning efforts. A resource inventory and rehabilitation-development strategy for Kordofan, for example, was recently prepared for UNDP by the Institute of Environmental Studies, a unit of the University of Khartoum established in 1978 with a grant from the Ford Foundation. The institute drew on university staff for the assignments, and among its consultants were persons who worked in Kordofan on the FAO Special Fund study of 1967. Their influence can be seen in the new study's call for land-use zoning.

Other calls for land-use planning have run afoul of donor indifference. In 1976, for example, the government announced the Desert Encroachment Rehabilitation Programme. Although an essential element was the creation of an office with land-planning capabilities, the project was dissolved into a set of proposals, some of which were funded and some of which were not. Eleven years later, when the new Intergovernmental Authority for Drought and Development held its first donor conference, Sudan's plan was prepared by the same forester who had primary responsibility for the 1976 program. Once again the plea for planning was ignored in favor of attention to specific projects, shelterbelts for mechanized farming, fertilizers for traditional cultivators, sand-dune fixation, range rehabilitation, and fuelwood plantations. Donors, it seems, want visible results, not intangible ones, however valuable.

In defense of this orientation, it can be said that there is no point recommending land-use planning in an environment without secure land titles, nor any point in exploring new crop rotations and range management methods when those methods can't be applied in the absence of secure land tenure. By elimination, donors are left to invest in infrastructure and the support of private enterprise, even though these undertakings threaten to bring back on a grand scale the environmental problems that worried the British 40 years ago.

Investment in Professional Development

What is to be done? Some hint of an answer arises from the fact that land tenure is not likely to be stabilized by anyone except the Sudanese themselves. When eventually they address it, they will discover that donors are probably unwilling to fund a triple-pronged set of programs in land-use planning, research, and private-sector stimulation. All these things must be done, and they will probably only be done by the Sudanese themselves. Only they will be able to do it at a cost affordable to the country and its donors. Ensuring that the Sudanese are capable of implementing these tasks thus becomes a matter of the highest priority. It is by no means assured: the ranks of the civil service and the universities have been severely depleted, as well-trained persons have found financially rewarding opportunities in other countries. The collapse of telephones, mails, and internal air and rail transportation makes the necessary task more difficult each year.

Nonetheless, it is one of Sudan's more remarkable achievements to have created, almost from nothing 30 years ago, a corps of hundreds of professionals. Some able and capable personnel remain, and young professionals are returning even now from advanced training abroad. No one can say how long it will take before the country gives them the support they need, but foreigners in the meantime can do few more useful things than help keep such people in Sudan. An excellent example is a recent Ford Foundation grant to Sudan's National Council for Research, which has used the funds to sponsor a research competition for multidisciplinary fieldwork in the

grasslands. Young researchers have been given support under this program to study labor costs, locally made plows, and wildlife populations. In the broad scheme the grant is small, but the research personnel are highly capable, and the council has helped Sudan retain some vital personnel.

Many donors will find this an unappealing suggestion, partially because it is neither dramatic nor immediately responsive to the country's urgent needs. Nonetheless, this alternative must be considered in the light of available choices. As this historical survey suggests, the other choices have consistently led to programs that have been almost totally disappointing, despite initial enthusiasms. Today, the enthusiasm felt by development workers in Sudan is directly proportional to their ignorance of history. The more that history is weighed critically, the likelier will be the conclusion that Sudan needs a more cautious approach, even a temporizing one like the one proposed here.

*Revised 2004 but not updated from the version published in *Geographical Review* (79:2), April 1989, pp. 143-160.