

INSTITUTE OF CURRENT WORLD AFFAIRS

A hitchhiker's guide to the cows and crops of Botswana

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Dec. 30, 1991

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Dear Peter:

Now, it's one thing to be told that Botswana is "an arid, semi-desert country with highly-erratic rainfall and poor soils." That's what the state department's area handbook says, what the guidebooks repeat, what Botswana's president and minister of agriculture use to explain the country's lack of rural development. But the words hadn't meant much to me until Bobbie Jo and I were hitchhiking through the countryside this month. I already realized how much Botswana depends on other countries to grow enough food for its people, since I saw mostly South African labels in the supermarkets of the capital city of Gaborone. In my first foray into the villages, however, I found the people in the remote areas equally as dependent on imported food. As I later traveled and talked to those involved in producing food domestically, from the commercial farmers working thousands of hectares and expatriate crop researchers to the small farmers and herdsmen, it became clear Botswana faces an irony: The nation's attempts to produce more grain and meat have, for the most part, created big ecological and financial problems.

For the first month here in Botswana, we initially confined our travels to zipping around downtown Gaborone in taxi vans, or trekking through the broiling heat to the nearby government ministry buildings. But early one Monday morning, we walked out to the southern road leading to the neighboring town of Lobatse and tried to flag down a ride. As I related to you back in the United States, one doesn't use a thumb when hitchhiking in Southern Africa. Instead, a hitchhiker flops his arm like a large, flightless bird in distress. The ungainly effort makes a larger motion, anyway, so you feel like you're accomplishing something while you wait for symptoms of heat stroke to appear.

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We stood in the tiny patch of shade and watched car after car whiz by us with gravel flying until I thought of a more effective strategy. I pushed my comely wife out into the sun to daintily flap her wrist to the motorists. We quickly had a pickup crunch to a halt on the shoulder of the road. Bobbie Jo sat in the cab and I stretched out in the truck bed to watch the scenery zip away into the blacktop vanishing point behind us.

Botswana can be so beautiful when seen from the back of a bumping pickup speeding down the highway. The rains had recently fallen, so my eye could scan along the green, growing horizon of the distant hilltops. Lush grass grew in front of the barbed-wire fence wobbling erratically alongside in a frantic race to keep pace with the truck. The brown hides of far-off cattle flecked the rolling swells of olive-drab landscape. The occasional odor of manure mingled in the wind with the hot-tar-in-the-sun smell of the road. From a distance, the land looks fertile and living.

When my gaze dropped nearer to roadside, however, I saw vital details missing from the broad canvas I had been watching fly past. The ground behind the fence was flinty and strewn with rocks. Patches of reddish sand stand out where the grass dares not venture from beneath the stubby briar bushes. Those verdant trees, when focused on, were a mass of thorns and leathery, sharp-edged leaves. Both scrubs and trees looked stunted; withered to the tough residual skeletons that could withstand both the sun and the browsing of goats.

Growing food in Botswana is damn hard. The soil covering most of the country is poor and sandy. The rainy season that begins in October provides barely enough moisture to grow crops in a good year. Agronomists say 500 millimeters of rain annually is necessary for crops to grow well, but few areas in Botswana receive even that minimum. (See Figure 1 on the next page.) That sparse rain can be fickle, too; sometimes giving only a few millimeters of rainfall before waiting many weeks for another light shower. Furthermore, Botswana has about the same land area and melting point as Texas. In this southern hemisphere, however, the cool temperatures coincide with the dry months from May through September. The hot season sends the mercury soaring as high as 110 degrees Fahrenheit, just as the rains arrive to encourage foolhardy young plants to sprout.

About 70 percent of Botswana's population live in the rural areas and depend on the sparse yields from the drought-resistant sorghum fields, with only one farmer out of four planting enough to meet his family's basic food requirements. (I'd better quickly correct my thoughtless sexism, because almost half the rural households are headed by women while men are working in urban areas or in the mines of South Africa.) During the drought years of 1981-1987, only 4 percent of those subsistence farmers produced enough grain to eat, which explains why cattle have

always been the insurance for survival in hard times. You can lead a cow to water but you can't move a corn field. Wealth and prestige have been measured by cows in the past and even today, the importance of cattle shapes the lives and policies of modern Botswana.

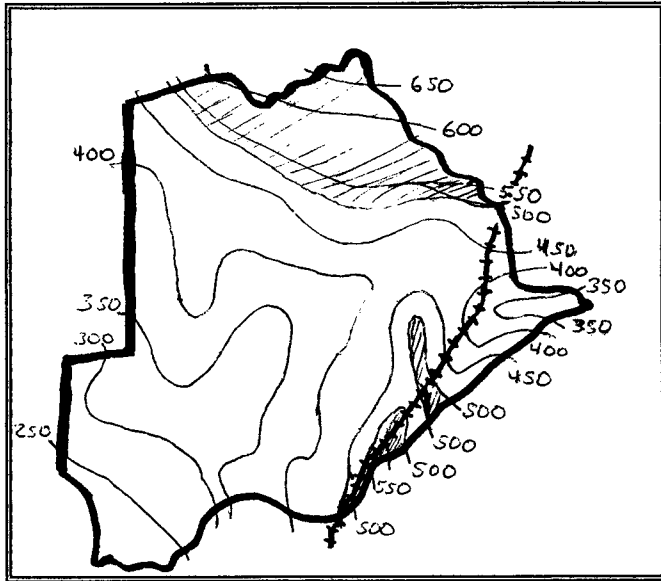


Figure 1: The rain is not generous to Botswana. The shaded areas show regions with a mean annual rainfall of more than 500 millimeters. Sorghum is the only crop that can withstand long dry spells and rainfall as low as 350 mm, provided it's well spread out. For that reason sorghum, and cattle, are the two mainstays of subsistence agriculture. [From A Geography of Botswana by David May (Gaborone: MacMillan, 1983)]

The pickup truck slammed on its brakes, breaking my reverie about the Botswana landscape. I twisted my head to peer around the truck cab in time to see a herd of goats scamper across the road. That set a pattern for the rest of the trip. Every few minutes, the driver honked and slowed for loitering groups of nimble goats, dull-eyed floppy-eared sheep, and cows angrily swishing their tails at the intrusion of a vehicle. We also stopped for a dead donkey, its forelegs still tied together in a hobble, lying in the road after an unsuccessful jaywalking attempt. The large number of animals, mostly alive, browsing along the road became my first clue something was up. Although I initially failed to understand it, I later learned the logical reason why so many animals grazed beside the road. The highway cuts through rural communal lands so completely overgrazed that the only edible fodder left is outside the rusty fences. The long grass in the ditches is normal, while the nude sandy soil on the other side of the wire shows terrible environmental degradation.

There was a second clue out there indicating severe overgrazing that my untrained eye missed. A range management expert teaching at the University of Botswana had to point it out to me. When cattle constantly remove the grass, the moisture in the ground remains as a bonanza for opportunistic plants to grab. Chief among the invaders in the sand veld of western Botswana is a bush called terminalia servicea, a densely-growing shrub with

small, light-grey leaves. The bush encroachment gets so thick in some places that the cattle can't get through. In a normal ecology, one sees varying sizes of young, middle-aged and old terminalia bushes as new generations are recruited. In degraded lands, the thicket of shrubs grows at a uniform height.

Along any of these desolate stretches of pavement occasionally I saw dirt roads leading into the tangle of brush, where the tops of thatched roofs poked above the bush like haystacks hidden away. We pulled off at one such road to stop before a large cinderblock building painted bright blue. The Naledi General Store constitutes a local landmark since it's the only building between the towns of Kanye and Jwaneng, where the majority of Botswana's diamond wealth is mined. It's also the only place where nearby villagers can buy food, soap, and sugar.

On the counter in front of Mrs. Kuki Dingalo, the proprietor, were heaps of potatoes, squash, onions and cabbage. She said all of the fresh produce comes from South Africa, several hundred kilometers to the south. Behind her, the shelves were densely stocked with cookies, cooking oil, and canned goods. With the exception of the red tins of canned meat and the sacks of sorghum meal stacked by the door, all the foodstuffs came South Africa or Zimbabwe.

"Some people do have little gardens where they raise spinach, cabbage and onions," Mrs. Dingalo said. I was surprised but relieved to hear that someone tried to grow vegetables, until I pressed her for details about what she grew in her garden. "Oh, in Jwaneng the women plant near their homes, where the taps and pipes are, so they can grow things," she replied. "There's not enough water in any village for a garden. Only in the bigger places. One day, if we have a borehole, I'll try it."

I later tried to track down a widely-circulated but unsourced piece of common wisdom that some of the South African vegetables sold by Mrs. Dingalo and others had originated in Botswana. University professors, government officials, and expatriate advisors all told me that farmers in the fertile eastern region called the Tuli Block sold their tomatoes and potatoes to South African "food processors," who package them in cellophane or in cartons for export back to Botswana supermarkets at higher prices. No farmer I spoke with would confirm that his vegetables boomerang back across the border, but I could understand why anyone would keep mum about such a sensitive subject. On the other hand, the government bans imported South African tomatoes and potatoes until after domestic producers have sold their harvests, so there wouldn't be any compelling reason for Botswana farmers to sell produce south.

To Mrs. Dingalo and many others, almost total dependence on imported food is a fact of life. To a man like Frank Buagkomo,

who has been involved in shaping government development policy, such dependence is a threat to Botswana's national security.

"Agriculture is the most important thing for a country," Buagkomo says in a deep, rumbling rasp. "We can't survive without it. Agriculture is crucial, so the future is with the farmers." Once a senior civil servant in charge of placing expatriate development workers in rural development positions, Buagkomo says he was forced out of government work by younger, university-trained men who had no practical knowledge of rural development. Although he remains on the board of the Botswana Meat Commission, he retired from his position in the civil service in 1983 to begin farming his land. If nobody else can make the sandy savannah produce food, said one of his friends, Buagkomo can. Of course, added the friend, very few people of Buagkomo's background have ever devoted themselves exclusively to farming.

Buagkomo is a determined man and, with his experience and vision, he will be a successful one. In the cool mornings, his shirttail flapping around his big belly that rounds out magnificently in the finest tradition of the African "big man," Buagkomo personally directs work at his farm that sits several hundred kilometers outside Gaborone. Just settling into middle age, his closely-shaved crewcut has just begun to gray. But his eyes still have a fierce twinkle that plainly say that this is a man to be reckoned with. On a recent morning in December, he was sending his hired men to build a fence around the site of a planned truck farm on his land. After looking over on-going repairs to a tractor, he marched off to another section of his holdings on a mission known only to himself. Once orders have been given in detail, he reappeared at his home in the village of Betesankwe to eat breakfast with his American houseguests. The walls inside his house are hung with various icons of one sort or another: a picture of Pope John Paul, photos of Frank's mother and father, and a painting of John F. Kennedy. In the book case next to the sofa are eleven books about the Kennedy family, alongside texts on cattle range management and land use planning.

Conducting a tour of his farm in a Toyota pickup, Buagkomo shook his head at the 300 hectares he fenced in that first year. All of the land was planted in 1983, but with scant rainfall nothing came up. This year, he says, only 25 hectares have been planted in sorghum with another 25 in corn. The severe seven-year drought that parched Botswana and prompted massive food relief for the rural areas officially ended in 1988/89, but Buagkomo believes the rains still have not returned to normal levels. Veering off the curving road bordering the fields, Buagkomo drove his truck straight into the bumpy newly-plowed earth bordering the barbed-wire fence. He explained that he wasn't satisfied with the original road, so by brute force he's creating a new track quite a bit straighter. "If there's something crooked, I'm the one to straighten it," he said, laughing, as the truck wildly

pitched back and forth over the rough terrain. Closer to home, he pointed out where he planned to erect shade netting and overhead sprinklers to grow a few hectares of vegetables to market in nearby Jwaneng. Several attempts to drill borehole wells for water on his land have resulted in costly, dry holes in the ground, he confessed. Yet he remains undaunted in his plans for future improvements.

"We need to pump more money into agriculture," Buagkomo said. "There's no need to encourage the population flow to the cities. Naturally, there will be migration out of the countryside. Instead of giving money to create industry in cities to attract people, they should help people like me create jobs out here." His wife, Josephine, has created some local employment as well. She manages her own chicken farm and sells about 80 dozen eggs a day to shops and bakeries in Jwaneng and Kanye. The eggs are fresher than those trucked from Gaborone, so she readily finds buyers. Her 1,400 chickens, however, come from South African suppliers.

Buagkomo is a rare person among the Botswana people. He is the ideal man the government is trying to promote. A good manager with a hands-on approach. Sophisticated with experience in agriculture. Dedicated to doing a good job and creating a productive farm at a time when many of the nation's educated elite look down on farming and traditional activities as a dead-end tradition lacking status and wealth. Rural jobs go looking for people, because young men are attracted to urban areas. And they're right. The new cars and nice clothes of the urban population looks good to a young guy plowing his sorghum field with a team of four donkeys. "Better to be a petrol filler in Gaborone than a herd boy out there," a cynical, unemployed, nicely-dressed teenager told me outside a Gaborone supermarket.

A.M. Sealetsa, the former mayor of the city of Jwaneng, sat on Buagkomo's veranda one night and tried to explain to me why there were few educated, experienced people in agriculture. "Frank's friends, Frank's comrades, think him inferior for raising cows and sheep and plowing fields," Sealetsa said. "They look down on the occupation. If you're a farmer, it doesn't matter if you attend school, they think you're someone to be kept away from socially. If what you're producing gets very low prices when salaries are very high in the city, it becomes a very difficult arrangement."

I think Buagkomo and his wife could be declared national heroes for their efforts to produce food in this arid land. They are struggling in an uphill battle, according to economic facts of life in Botswana. Statistics can be boring, but explain a lot.

* According to the latest government figures, Botswana must import 70 percent of all the vegetables and milk

products consumed in the country, mostly from South Africa.

* 85 percent of Botswana farms are small-scale, almost one-third of them with less than 3 hectares and only 6.8 percent with 10 hectares or more, the minimum necessary for household self-sufficiency in years of reasonable rains.

* In the drought years from 1981/82 to 1987, domestic production supplied less than ten percent of the country's annual cereal requirements in sorghum and corn. That percentage hasn't risen much higher in recent years.

*The entire cost to the country for the production of one ton of sorghum or corn remains at least twice the cost of importing the same ton of higher-quality grain from South Africa.

* The government, recognizing the advantage of growing drought-resistant sorghum, spent 100 million pula (about 50 million dollars) since 1985/86 on the Accelerated Rainfed Agricultural Programme to promote that crop. Most agronomists and experts I talked with acknowledge that the program did provide draft animals, implements and fencing to rural farmers that improved their ability to grow crops. Nonetheless, only once--with the bumper crop in 1987--did Botswana grow enough sorghum to meet its needs. And that year the government marketing board was stuck with huge surpluses because of the artificially high price set for sorghum. Consumers also shifted their preference to corn, rice and wheat, so domestic demand for sorghum precipitously dropped as the bill for imported foods skyrocketed.

* By lending about 294 million pula (about US\$147 million) to the agricultural sector during the last decade, the state-run National Development Bank took heavy losses after many farmers defaulted. Most can't get credit, but those who did lost their loan money after poor harvests. Mercifully, the bank did not foreclose on those farmers. Under a new get-tough policy outlined in the new national plan, however, the government now intends to seize their staked assets.

There have been other programs that ended in ignominy. The government gave money to people to uproot tree stumps in a program designed to increase croplands. Not unexpectedly, millions of pula were paid to people who ripped out forests of trees and never intended to plow the area. Environmental havoc, and few crops, were reaped under the Accelerated Rainfed Arable

Programme that began in 1985. ARAP was a means of "preventing the collapse of agriculture and forestalling wholesale migration from rural areas," according to the government. Money was given to farmers per hectare of sorghum planted, sending many people out to plow up fields with little expectation of a real harvest.

Faced with figures like those above, there's been a quiet but dramatic announcement made by the Botswana government in the next five-year plan charting the country's future agricultural policy. While previous programs aspired to creating food self-sufficiency, officials now admit the country won't ever be self-sufficient. Ever. So they've given up and instead plan to struggle for a goal defined as food security. "Given the poor weather conditions which all farmers face and the poor soils," said Quett Masire, Botswana's president, "it has become quite apparent that food self-sufficiency cannot be achieved without massive subsidization of the production process."

A nation's spirit must suffer with the admission that the country will never feed itself, but must always rely on outside purchases and donations. The new goal of "food security" is a pragmatic realization that the agricultural sector has suffered a disaster, that most of the rural dwellers are fleeing their desiccated fields for the cities, and the loans and subsidies to encourage food production have been wasted. People have to earn a living somehow. Speaking last month at the graduation exercises of the Botswana College of Agriculture, Masire said farmers in the traditional agricultural sector must be fully integrated into the market system, so that they can produce a surplus and earn their living from income so derived. Another member of government, an assistant minister of local government, lands and housing, told a meeting at Jwaneng that farmers continued to grow the subsistence crop of sorghum "...even in areas where it is not economical to grow it." He explained to the audience that: "Though sorghum is the major drought resistant crop in the country, it would be useless to overproduce it when it floods the market."

Now the government plans to create rural income generation and employment based on growing and selling commercial crops, such as peanuts or sunflowers, to earn money to buy food imported from South Africa. Following the principle of comparative advantage, Botswana will concentrate on producing cash crops, raising livestock and selling its mineral wealth to earn foreign exchange for food imports. Government-guaranteed prices for sorghum will fall by about 30 percent, while prices paid for sunflower seeds and peanuts will rise about the same amount. In essence, then, the future of Botswana's rural people lies in making enough money to buy food, instead of growing enough to feed themselves. That's a perilous transition to make, if an individual's income fails without a harvest to fall back upon. The government, recognizing that danger, also announced that a

national strategic grain reserve will be created to store up to six months of food to prevent famine if crops fail.

I asked the minister of agriculture, Daniel Kwelagobe, how soon such a reserve would be in place. You would have thought I had asked him about nuclear missile silos, not grain silos. After exchanging a significant look with his assistant, Kwelagobe said that such subjects pertained to national security and could not be discussed. On any other subject, however, Kwelagobe was more forthcoming. I asked him point-blank if the government was admitting that it had failed to provide for its people.

"Yes, I think we spent quite a lot on food self-sufficiency policy arrangements but really without getting much of the benefit out of it," Kwelagobe said. "If I may give an example, we were producing sorghum in this country at a very high cost to the farmer, to the government, yet we couldn't sell it to any other country because it was cheaper to produce there than here. We were expecting people to produce sorghum even in areas where it was really not the right type of crop to grow." I had to scratch my head at that. If an area wasn't right for sorghum, the crop of last resort in poor soils, it wouldn't grow anything. "Then you will forget about sorghum if you want and concentrate on livestock and then sell them to get whatever food you need for your upkeep," he retorted.

Without good prices paid for sorghum, I asked, wouldn't the government take away the only livelihood for the marginal farmers without cattle? Kwelagobe was getting tired of this line of questioning. "The small subsistence farmer who has been growing sorghum will continue to grow that," he said, wearily. The important thing was that larger farmers would grow peanuts, sunflower, cotton, even sugar in suitable areas, he said, while agro-industries such as crushing sunflower seeds for oil would also be created. Even in the rearing of cattle, the government wants people to diversify from beef into dairy, piggeries, poultry and various other husbandry. "Maybe even into game farming, for instance, and bee keeping. So we think that if we make it that broad, it will accommodate people."

And who will help the uneducated peasants change from their familiar crops of beans and sorghum to grow peanuts or cotton? Among the government's agricultural demonstrators charged with explaining and assisting with these innovations, there's almost a 50 percent vacancy rate. Nobody wants the job. Most farmers I spoke with described these government staffers as "unmotivated" and "useless." In defense of the extension workers, the government points out that administering food relief during the drought years left little time for the overworked demonstrators to assist farmers in improved techniques, and the program has yet to fully recover.

If most private banks won't lend to the agricultural community and the National Development Bank lends only to the literate, larger farmers with assets to put up as collateral, the poorest people in the countryside will have no opportunity or inclination to try beekeeping or growing sunflowers. They will be excluded from the diversification program while, at the same time, the price support for the one crop they have traditionally grown will be cut out from underneath them. I can almost hear the rumbling rupture of the social strata being split apart like the San Andreas fault opening up during an earthquake.

Maybe you think I'm over-reacting a bit. After all, while the peasants won't be assisted in growing sorghum any more, they will always have their cattle to fall back upon as they have in times past. Although everyone agrees that Botswana is "an arid, semi-desert country with highly-erratic rainfall and poor soils," there is a comparative advantage for the nation in cattle raising. The question, however, is who owns the cows nowadays.

There was a previous government program that aimed to transform rural life and instead ended up widening the gap between the rich and the poor when wealth--as traditionally measured in terms of cattle--became concentrated in the hands of absentee landowners, the urban elite. The gap has continued to widen today, based on that first major fracture. Initially hailed by European development experts as a progressive reform that would promote better management of cattle and reduce overgrazing of land by cattle, the Tribal Lands Grazing Policy adopted in 1975 did exactly the reverse by allowing a dramatic increase in herds at a devastating cost to the environment. The government handed out about 400 huge parcels of land, previously held in common by local communities, to men who were thought to be better at livestock husbandry. Their qualifications apparently were based on their bank accounts.

"Most of the TGLP ranches were taken by relatively wealthy people who had no intention of being modern cattle ranchers, but just took the land," said a British agricultural researcher who worried about losing his government-financed job if I quoted him by name. "Most people see it as a land grab." In one widely-circulated story that he related, the 300- to 500-hectare ranches were given to people who appeared to be rich because they produced a stack of "blue book" car registrations. As each successful new owner left the land allocation meeting, the story goes, he handed his stack to the next man in the line outside the door. "There's been a political realization that land is moving into fewer and fewer hands, while access to land for poor people will eventually disappear," the unnameable British agronomist continued. "The prospects of staying on the land and making a living are very slim nowadays. Rural people can see that you can do better in the city, so a massive migration continues out of the communal lands."

The stock limitations that had been drafted into the original TGLP proposal by expatriate advisors were eliminated. Instead of fencing the land (as they were required in their lease) or wisely limiting their herds, many of these TGLP ranchers scrambled to drill new boreholes to provide water for their growing numbers of animals. The pattern continues. A "tragedy of the commons" has been created, using the phrase coined in the late 1960s by American expert Garrett Hardin to describe the abuse of common resources that no individual feels responsible to conserve. Instead of 200 or 300 healthy cattle, some ranchers hold 400 or 500 poorer quality animals. When the private holdings are denuded of grass, the too-large herds are moved back onto communal lands to destroy the pasturage there. The result is an ecological nightmare of uncontrolled herd growth until the carrying capacity of the land is reached, creating the overgrazing conditions that I see all along the roadside of Botswana. While the big men lost 50 or 100 head of cattle each in massive die-offs during the drought years, the small guy living on the communal lands lost his entire herd of six or seven cows. The national herd of cattle has grown again in the last few years to an estimated 2.6 million animals, with half the national herd owned by five percent of the population. Many of this minority who have all these cows on their TGLP ranches are politicians, civil servants and community leaders who make and administer the environmental laws that could conceivably limit such overgrazing. There's a conflict of interest there that prevents closing the loophole that allows them dual grazing rights. On the other hand, some 45 percent of the poorest rural households hold no cattle whatsoever.

Okay. I know that my plane ticket over here, my monthly rent and my daily bread is being paid for by the Institute of Current World Affairs. I'm very aware that you want to know about the present state of affairs in Southern Africa. But just as I had to risk boring you with statistics, I feel compelled to give you some background history to emphasize that a dramatic social dislocation has occurred when, in a cattle-culture like that of Botswana, almost half the rural population doesn't own a single cow! The key to understanding Botswana's present ecological predicament lies in the persistence of some traditional cultural features and the elimination of others.

Colonialism had a lighter touch on Botswana, unlike other African nations in the British empire. As a protectorate, the country wasn't colonized in the usual way. There weren't large numbers of white settlers taking away large tracts of farming land from the native population, like in Zimbabwe or South Africa. Life went on pretty much as before, except for an innovation that today is at the heart of the environmental degradation of the country: Cattle became a commercial commodity to be bought and sold for money.

Traditionally, cattle was everything in Botswana society. Ownership of cattle was the means to live, while the lack of cattle signified a nobody. Cows were used to pay bride prices, pay fines and killed to be eaten at important ceremonies. And while cattle could be grazed over large areas of poor grassland, which is in abundance in Botswana, crops had to be grown only on the better soils. The importance of cattle led to a pattern of farming unlike any other in the world, called the "three-site system." Cattle, crops and the huge, central village were all located in separate locations to keep cattle away from the fields, to reduce the risk of losing everything to drought and for safety in times of war. This "three-site system" of rotating people and animals from place to place acted as a natural ecological balance to prevent overuse of the land.

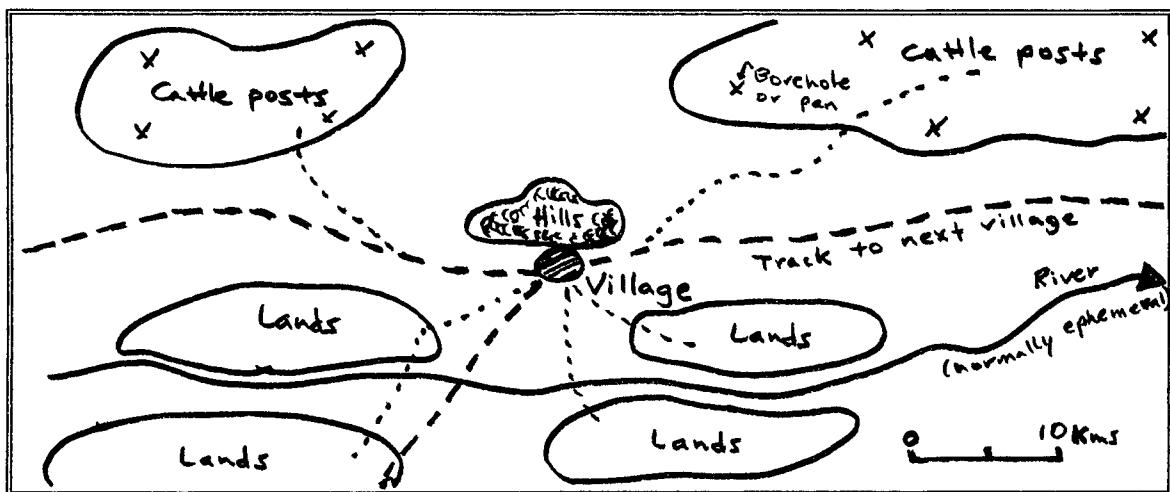


Figure 2: The three-site system traditionally used in Botswana. [from A Geography of Botswana by David G. May (Gaborone: MacMillan, 1983)]

There were also two cultural institutions that helped conserve environmental resources in the traditional world. One was the kgotla, where the villagers could open argue about disputes in water rights, allocation of land and other collective issues under the direction of the chief. In this way, a consensus was reached on supervised grazing and head of cattle per hectare. The other traditional practice of mafisa, in which cattle were loaned for extended periods by wealthy men for the use of those who had fewer head. The rich got herders for their cows, the poor got milk, meat, draft power to pull a plow and the occasional calf. Thus mafisa dispersed the herd over a wider area than if all the cattle were held together by a few families. Mafisa loans were a means of forging economic and political relationships, and preventing disruptive inequalities from developing in the society.

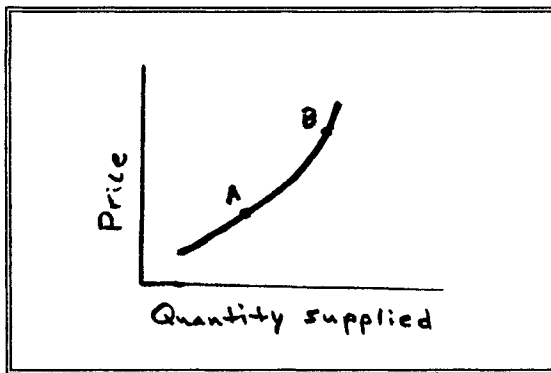
The tribal chiefs, while still holding tremendous prestige with the rural population today, no longer can control land allocation or correct misuse of the common pastures. In post-independent Botswana, the government took away the land allocation powers of the chiefs and gave it to 12 tribal land boards, which in turn administer smaller sub-district boards. The local district council, the chief's tribal kgotla, the ministry of local government and lands all appoint four to six people to sit on the board. The boards hear disputes involving land issues, but have no authority to intervene when land is overgrazed.

The still strong and binding network of social obligations involving mafisa cattle mean that much of the cattle that should have been moved out to the TGLP ranches remain to overgraze the communal areas. For example, the mayor of Jwaneng, who began his herd with the cow his father gave him in 1976, now has more than 300 on his TGLP ranch. How many are truly his? I asked. "Cattle are our bank accounts: Would I ask you how much you have in savings?" he began his indirect reply. "Our country is a semi-desert and the only water you can get is through a borehole. So if you get one, you have friends and family come and say 'Please, please,' and then there's ten people using your borehole. You can be too lenient and end up with too many head. But my headboys earn a cow per year in addition to their salaries. In the end, where do they graze?" Another wealthy cattle owner outlined his problems with his borehole: "If I am honest, I must say I have too many cattle on the ranch, especially during the drought when grass is poor. But I have problems. I had to drill three boreholes before striking water. I got a rebate, but it still cost much more than I expected. If I kept less cattle, I would be unable to cover repayments to the bank."

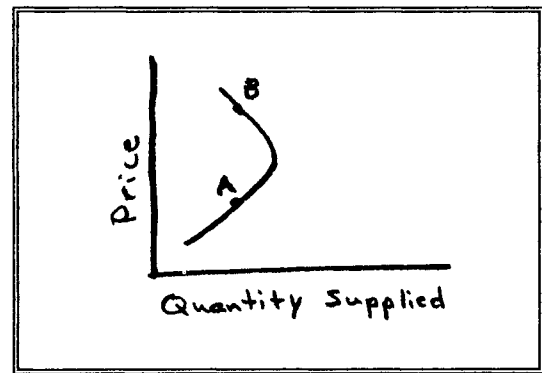
The role of well-meaning international assistance also has to be pointed out. To assist Botswana to struggle free from its dependence on South Africa, the European Economic Community gave Botswana a quota of beef to export at a subsidy four times above the world price. That's an economic incentive to "beef up" livestock numbers, even at the risk of overutilisation of land and massive "die-offs" of cattle if the rains don't come. The World Bank has financed loans for more boreholes, cows and ranch leases in three major livestock development projects in Botswana.

Brazilian range management expert Joao Queiroz, a professor of environmental science at the University of Botswana, believes that the basis of Botswana's overgrazing tragedy lies in the difference between commercial and communal ranching. A commercial rancher's goal is to raise fat cattle to sell on the market, while a traditional rancher is trying to maximize the number of livestock that are most often of poor quality. The government expected productivity to increase and more cattle to be sold to the abattoir for export because they assumed the TGLP ranchers would be commercially minded. Instead, the new land owners are

just as traditional as their fathers. "There's a backward bending supply curve at work that accounts for the low culling by cattle owners," Queiroz said, sketching a backward "C" on a graph to indicate a sharply reversed trend at some imaginary half-way point. "See, as price increases, a commercial farmer would sell more cattle for a bigger profit. But a traditional farmer sells less at the higher prices, since he raises more money with each cow he sells off for his needs, such as weddings or taxes. A man would rather invest in a cow than in a bank."



Standard supply curve



Backward-bending supply

Figure 3: "An increase in the price of the product under consideration usually results in a change in quantity supplied, involving a movement from one point to another--as from A to B--on a fixed supply curve." [From *Economics* by Campbell R. McConnell (New York: McGraw Hill, 1987)]

I asked Queiroz a simple question to gain a short respite from the technical concepts: What is the long-term social impact of making communal land into private property? During our discussion of overgrazing, bush species encroachment, carrying capacity and supply curves, I had forgotten the nationality of the expert with whom I was talking. His answer, however, made me think of the miles of rural slums encircling Sao Paulo. "It'll be a bad scene, a major problem, because only the people who have the know-how to drill a borehole and fence it off will be wealthy. There will be a concentration of wealth and we'll start getting shantytowns." South America has its own history of land and cattle being concentrated in the hands of a few.

What does the future hold for Botswana's capacity to produce food? In terms of cattle, the answer is not clear-cut. The government's own five-year plan contains a strong-worded warning that dual grazing rights for the large herd owners must be eliminated. Kwelagobe, although a powerful senior official holding the reins of the ministry of agriculture, seems helpless to close the loophole. "It's a very sensible thing, but as I say it's something we have not definitively decided on," he said. After the last drought destroyed their cattle, many of the those

living outside the cities are flocking to sheep and goats, which can be sold to the Botswana Meat Commission at better prices than before. "The goat is the outcome of bad degradation," explains Queiroz. "Because there's more bush, the outcome is more goats. As a browser, they primarily use bush while grazers like cattle use grass primarily. Look along the roadside and you'll see goats nibbling on the bushes, not grazing on grass."

The future of Botswana's farming seems dim at best. The dreams--and nightmares--of food production in Botswana have been centered on the vast Mpandamatenga plains in the country's northeast corner, where the rain falls in abundance. There the government has invested about 10 million pula in state-underwritten loans to assist farmers in clearing, plowing and planting the grasslands. Officials believed the area could supply 60 percent of the nation's grain needs, so a further 10 million pula was spent to build towering grain silos for huge harvests. The bumper crop never materialised and probably never will.

Driving north some 400 kilometers from Francistown, the second largest city in Botswana, I noticed the coarse terrain of scrub brush and sand began to thicken into taller trees the farther I drove the rented car. The tall grain silos in the village of Mpandamatenga can be seen from a distance, towering over the thick forest of mopane trees. Suddenly, the trees on either side of the road parted like a curtain to reveal the flat horizon-to-horizon fields of the Southern Plain. Divided into 16 farms, each about 1,200 acres, the place has the same monotony as the endless cornfields of Iowa. The confining trees that close in again around the village gave a claustrophobic feeling after those sweeping distances, but the scenery soon opens up again into the "central plain." Even larger than the first set of farms, this middle plain holds 33 more enormous farms totalling almost 40,000 acres that stretch farther than the eye can see.

After an 18-month, government-funded investigation on Mpandamatenga, an outside British consulting firm concluded in its final report that "if matters are left as they are, the scheme is likely to deteriorate rapidly." About 70 percent of the farms are poorly managed and are at the point of insolvency, the study says, while the only chance to save the scheme lies in a five-year government program to invest 22 million pula, or approximately US \$11 million. The main problem facing the farmers there is the soil, which is fertile black-cotton clay very different from anything else in Botswana. If a farmer waits too long to plow after the rains begin, the fields turn into quagmires and tractors bog down in the sticky mud. None of the farmers have had previous experience with this type of soil. The report concludes "high standards of farm management are obligatory" if Mpandamatenga farming enterprises are to survive.

The already beleaguered farmers face greater difficulties when the subsidized price of sorghum will drop, since 73 percent of the plains is now planted in sorghum. Then they will have to switch to growing corn, an unfamiliar crop. And that change is problematic, since corn is less tolerant of Mpandamatenga's peculiarities than sorghum. "Maize requires very careful management to reduce simultaneously the risk of drought and waterlogging/flooding, both of which affect maize more than sorghum," the report warns. Despite the increased risk, corn must be grown because "without the projected move over to maize production it would be impossible to construct an argument in defence of maintaining Mpandamatenga."

The gloomy message of probable failure comes from the official study, while the farmers angrily defend themselves against growing public criticism. "It's easy to sit in Gaborone and see the money going out, but they don't realize we're feeding the public," said Louis Mulder, who is reputed to be the most successful manager in Mpandamatenga. "If they don't support us, who is going to feed the people." I had waited for about an hour in Mulder's thatched rondavel for him to come home, watching a heavy downpour turn the countryside into a marsh. Mulder arrived on foot, drenched and covered in mud. He had walked home, his four-wheel-drive pickup left in the fields that night. "The government mustn't close their hands now, not all the farmers here are bad," Mulder said earnestly. "The farmers who stay in Gaborone and hire managers, then that's bad management. But there are farmers here who have put all their money into this land." Mulder owns three farms where he cultivates about 1,500 hectares, then leases another 2,000 hectares from four other landowners. But despite his apparent success, he had recently returned from Gaborone after negotiations to reschedule more than 1 million pula in outstanding loans. Does Mulder think Mpandamatenga is a failure? Counting on his fingers, he calculated that while 18 of his neighbors repaid their loans, 20 have not. Successful farming here can be almost as likely as a coin flip.

Despite the gloomy outlook, the government plans to expand the farming scheme onto another 60,000 hectares of a third immense plain, although the report cautioned against such a move because of existing problems. Environmentalists also argue against expansion because farming would destroy wildlife habitats and migration routes for rare and endangered birds and animals. Mulder and other farmers also oppose the expansion, fearing the dwindling government assistance would be stretched too thin. But Kwelagobe, who supports expansion, is looking at the long-term: "I don't see the government abandoning the farmers in Mpandamatenga or anywhere else in the country, but what we are emphasizing is that management must improve.... Population is worrisome because you could have too many mouths to feed, and we happen to be living in a country that hasn't the best of soils."

Sincerely,

