More and more people in developing countries, however, are seeing that wildlife can provide sources of both food and income on a sustaining basis. Game ranching is becoming increasingly popular in many areas and some species, notably the eland, may lend themselves to livestock-like types of operations.

But, day-to-day survival is a real concern to local people in developing nations, and they must be convinced that the desired land use—whether it is livestock ranching, game ranching, farming, or whatever—is a means of improving their level of existence rather than only the recreation or occupation of the very wealthy. Noncompetitive rangelands management has the potential for providing this conviction. Also important to a protein-hungry people is the fact that game meat is nutritionally superior (has a higher protein to fat ratio) to domestic livestock. In addition, less forage is required to grow game animals.

However, perhaps the most important benefit of noncompetitive management is that it allows productive use of land while maintaining and enhancing options for future use. In other words, we can make marginal lands produce high-nutrition foods on a sustained basis without diminishing their potential for alternative future uses.

Opportunities also exist in utilizing natural resources, including fish and wildlife, for recreational purposes as an additional “harvest” from rangelands. Sport hunting and fishing is a truly big business here in the United States and elsewhere, with billions spent annually for equipment, transportation, and services. Safaris, for gun hunters or camera enthusiasts, can provide important sources of income and/or food for peoples of developing countries as well. One of the most widely accepted ways to cash in on wildlife resources is to set up parks or sanctuaries, with photography providing a lucrative tourist trade. The governor of one southern state has put it this way: “Each tourist is worth more than a bale of cotton and a whole lot easier to pick.”

In our opinion, every country—developing or developed—needs long-range natural resource development plans. Land and water areas must periodically be inventoried and classified. Those of particular value for producing food and fibre must be set aside and protected from developments which take them out of production, such as housing or industrial sites, or airports, or highways. One of the great contributions the United States can make is to provide its expertise in the land use planning or agricultural fields for those nations which are not as well developed.

Because of the increasing need for human food and for recreational benefits, ranges of the world must be managed for all animals in manners which permit a maximum in production with a minimum of competition between species.

Rising human populations in many parts of the world accentuate range management problems and emphasize the dangers of retreating to a goat economy. By providing noncompetitive rangelands management for animals, both wild and domestic, we can help avoid this almost irreversible pitfall.

The Role of Rangelands in World Food Production

Gerald W. Thomas

Much has been written in recent years, and much rhetoric has taken place, about the serious nature of the world food problem. It may seem logical that the focal point of these discussions has been on the world’s “cultivated land base” and on “grain production” as the measures of food security. However, this simplistic approach tends to ignore the significant role of rangelands and the contribution of grazing animals—both domesticated and wild—to world food production. This lack of understanding was apparent at the World Food Conference in Rome in 1974 and has continued to persist in our literature. As a result, little attention has been given to re-directing our research efforts or to strengthening our education and extension systems as they relate to the food production values of this vast noncultivated land resource.

Society and the scientific community tend to overlook the direct contribution of rangeland to food production through animal agriculture. In addition, there is a shortage of good literature relating to the interdependency of rangelands and cultivated lands, even though some recent sophisticated energy analyses have attempted to bring this point into focus.

Many of us thought we had realized a “dream come true” when the world became “ecology conscious.” We thought that now, perhaps, the scientific community would see the need for more research on large range “eco-systems”—that the world would now take steps to analyze vegetation change and man’s role in the environment. These dreams, for the most part, have not been realized.

An illustration of the lack of understanding of the contribution of rangelands to world food supplies is shown by the following comments published in the Journal of Range Management after the author’s attendance at the World Food Conference in Rome in 1974. (Thomas 1975)

Animal agriculture came under constant attack from some participants with the simplistic assumption that all animals were produced at a cost of 4 to 10 pounds of grain that could have gone directly into human consumption. However, the important contribution of the ruminant animal as a converter of roughage, the importance of range livestock production, the role of animals in the utilization of low-quality grains and grains bred specifically as “feed grains” and not “food grains,” was neglected. The American livestock producers present at the conference were very concerned about this
misunderstanding." Also, several reporters noted that while delegates on the floor were condemning livestock production and the excessive eating habits of affluent societies most of these same persons consistently ordered beef steak or lamb for dinner in the evening.

Needless to say, these observations still reflect the opinion of many people. However, I am encouraged by the fact that both animal scientists and range scientists responded with some follow-up studies after the World Food Conference—particularly as a result of attention to the African Sahel problem and in response to outrages from the "wounded" livestock producers.

Nature and Extent of the Range Resource

The world's largest land resource is range and pasture, which accounts for approximately 50 percent of the land surface of the earth. Most of this rangeland is not presently adapted to intensive land use because of rough topography, severe temperatures, or poor soils; but the predominant limiting factor in production is lack of moisture.

On a world-wide basis, most of the world's 1.2 billion cattle and buffalo, one million sheep, and 700 million goats spend part of their lives on rangelands. There are 483,387,000 hectares (about one billion acres) of rangeland in the United States that have an estimated forage potential equivalent to a year-long supply for 35 million cows—a quantity capable of feeding 85% of the current beef cattle population in the United States. (Cook 1978) In addition to livestock, rangelands serve as habitat for many species of wildlife, insects, etc.

The total contribution of rangelands to world food production is very high—perhaps greater than most statistics indicate, because of "indirect" relationships. The severe situation in the African Sahel is a good illustration of both the direct and indirect effects of low range productivity during drought on all forms of wildlife, livestock, and people. When a "dry cycle" hit these semiarid rangelands, all life forms suffered, and the combined effects on man and animal were devastating. At the root of such tragedies is the neglect of most countries—the Sahelian natipns included—to recognize the value of proper management of their vast semiarid range areas.

Interrelationships between Range and Cropland

The range livestock industry, particularly in the western United States, is very dependent upon cultivated lands for supplemental feeds. Economically, as well as ecologically, "harvest" of food and fiber from most rangelands exists in delicate, fragile relationship with small areas of intensive agriculture (Lansford 1977). Factors which affect crop production, such as the price of energy or fertilizer, can easily cripple or even destroy the range livestock industry. It is important to identify these rangeland-cropland relationships in our analysis of food and fiber production systems.

Most irrigated lands are dependent upon adjoining range and forests watersheds for both quantity and quality of water. Therefore, food production from these croplands is linked to vegetation management on the surrounding range. In addition, proper management of rangelands insures stability to the total biological complex.

Title XII: A New International Opportunity

Passage of Title XII of the Foreign Assistance Act of 1975 places new emphasis on research and education in the international setting. Perhaps now new attention will be given to the role of rangelands and animal agriculture in production systems. Also, the impact of the First International Rangeland Congress brought together scientists, educators, and practicing range managers from various parts of the world. Such an assemblage should help redirect attention to the value of the range resource.

Title XII Amendment builds on the congruence of two factors—the existence of a serious, continuing world food problem on the one hand, and a set of internationally committed and experienced United States universities with a widely acknowledged success record in agriculture on the other. This new legislation will strengthen worldwide efforts to increase food production on croplands, help to obtain resources, and increase the research and educational efforts relating to rangelands.

The Amendment provides for a Board of International Food and Agricultural Development (BIFAD) which will participate actively in this new effort, providing specific guidance to significant aspects of the Agency for International Development activity and participating in broader related areas of agency food and agriculture programming. The author is a member of this board. There are several aspects of the legislation that deserve attention in this discussion:

(1) Focus on Teaching, Research, and Extension

The Title XII legislation is based on the belief that much of the progress made in the United States agriculture has been due to the combined approach to teaching, research, and extension in our agricultural colleges and universities. This pattern differs from that of most other countries, where teaching is often rather basic and centered in the universities, while the major programs of research and extension are handled by federal agencies or Ministries of Agriculture rather than by the universities. As a result, students may not get direct exposure to applied scientists, and communication problems tend to develop among agricultural teachers, researchers, and extension specialists. On the other hand, the United States' system directs exposure of the university faculty to problems of the farmer, which tends to redirect the research effort and underline the importance of technology transfer.

(2) Target the Small Farmer and Poor Majority

Based upon Congressional mandate, programs of the Agency for International Development (AID) must be re-examined to make certain that the target is to improve the lot of the vast poor majority in the under-developed world. The focus, then, for university efforts under Title XII must be to improve the food production capabilities and the economic status of small farmers and small ranchers. This particular mandate has caused considerable debate and frustration both for the Agency for International Development and for the American universities. Indeed, many efforts to increase food production have historically helped the upper or middle classes—the larger and more advanced farmers and ranchers—rather than the majority. Some types of sophisticated technology—some forms of mechanization—can be utilized only by the better-educated and more economically stable groups.

The problem of increasing food production on "small farms" may be difficult, but the challenge to help the "small ranchers" is even greater. Historically, small livestock operators worldwide, have had a tendency to try to increase their income by "overstocking." And, overstocking on rangelands with limited rainfall can lead only to further deterioration of the range resource, thus reducing rather than increasing the food production potential. Many of the attempts to help these small ranchers have led to further destruction of the vegetation resource. For example, new livestock water developments placed in under-
utilized rangeland in the African Sahel have often led to further overstocking by small livestock producers bringing about the danger of "desert encroachment."

(2) Long-Term Relationships with Cooperating Nations

One of the objectives of Title XII is to develop long-term and continuing relationships between the United States universities and foreign universities. It is anticipated that Title XII will enhance faculty and student exchange. Also there are programs within AID to stimulate farmer-to-farmer and rancher-to-rancher exchange. Our own American livestock producers can learn much from other nations. It is hoped that all these activities will lead to better understanding among all nations of the importance of cooperation in the prevention of famine.

Summary

The significant contribution of the world's rangelands to food production has not been adequately recognized by the scientific community or by society as a whole. This contribution to world food supplies is direct, in terms of the production of livestock products and some plant materials, and indirect, since vegetation management affects water yield, biological stability and environmental enhancement.

As man seeks to satisfy the needs of a population expected to double in 30 years, the world's rangelands will be subjected to increased demands for many uses, including food production. These demands must be met without major disturbance of range eco-systems. We must determine through additional research the optimum harvest level for livestock and other food-producing animals and at the same time allow energy, nutrients, and water to flow to the multiplicity of other biological organisms necessary for environmental stability.

Twenty Commandments for Grass Men

T. Lawrence

I

Thou shalt divide thy pasture lands into thirds or quarters and graze them in succession, starting with Russian wild ryegrass or crested wheatgrass in the spring, native grass after June 15, Russian wild ryegrass in the summer and early fall, and Altai wild ryegrass in the fall and winter period, letting thy kine onto the first a little before it is ready; always moving them to another part when they have consumed the percentage growth allowable from that species, for the leaves are the digestive apparatus of the grass, and verily, while man can live in health with half a stomach, if his entire stomach is removed, he dies.

II

If thy pasture system contain both tame and native grasses, thou shalt vary the grazing height from one to the other according to the needs of each, so as to maintain both in good health. If either shalt start to deteriorate, thou shalt adjust the grazing or haying pressure so as favor the weaker until it shall regain its strength, for verily, both are precious onto thee.

III

If the good grass which enriches thee starts to disappear from thy pasture, thou shalt give it a vacation. If thou hast disobeyed this commandment in the past and thy pasture is too far gone for the good grass to recover, thou shalt destroy the weeds and tares thereon and replant it—or if the soil be loose and vulnerable to the wind, interseed—and thereafter sin no more.

IV

Thou shalt heed the advice of sages and exercise caution in the renovation of fragile ranges and those with sandy soils for fear of exposing thy trust to the ravages of erosion. However, as time and capital permit thou shalt break suitable pastures and reseedeth with Pedigreed seed of recommended varieties to at least triple or quadruple production from the resource entrusted to thee, for verily, men in other parts of thy world have not meat to eat nor milk to drink.

V

To assure that thou art not seeding noxious weeds into thy carefully cleaned and well tilled soil, insist on Certified seed of recommended varieties for verily, it is not meet to add to thy troubles and those of thy neighbor.

VI

For maximum production thou shalt include a legume in thy reseeded pasture, use appropriately wide row spacings, adopt recommended seeding patterns, seed no deeper than three centimeters, and apply suitable fertilizer and herbicide applications for these will help to feed the multitudes and supply thy new chariot.

VII

Thou shalt move thy salt and mineral from place to place at a far distance from thy water, to encourage even grazing. If possible, locate thy kine's drinking water for the benefit of thy range, not for thy own convenience. In some locales stock will graze three or four times farther south of their water than they will to the north. They do this in summer to take advantage of a cooling southerly breeze and in the winter to flee the cold north.

The author is with the Research Station, Research Branch, Agriculture Canada, Swift Current, Saskatchewan, S9H 0X2.

Editor's Note: The author may have had tongue-in-cheek as he put his basic rules in Commandment form, but GOOD Grass Men follow these same rules as though they were Commandments.