Overgrazing: The Crux of the Pastoralist Controversy

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Abstract:

Debate rages worldwide over the real effects of various grazing management practices. Results of many decades of applied scientific analysis of grazing management have proven largely ambivalent. At the origin of the debate is scientific use of 'grazing', and 'overgrazing', as finite, measurable terms. A conventional, Eurocentric interpretation of plant/animal relationships has provided the global models of grazing and overgrazing for more than seventy years (ex. Clements,1916; Pole-Evans 1932 ; Aubréville 1938; Dyksterhuis, 1949), and measures to counteract the degradation of land based on this model have been applied intensively worldwide by the World Bank, ODA, ORSTOM, USAID, UNEP, UNFAO, and most other technical aid organizations.

A review of the results of counter-overgrazing strategies indicates far less of a clear cause-effect relationship than would be expected (Ellis and Swift,1988; Behnke and Scoones, 1991), leading to an increasing questioning of the practices underlying grazing management when applied in non-European contexts (Rhodes,1991; Savory 1999). In this paper we propose to analyze the conditions which have given rise to the presently, generally-applied standards for overgrazing, inquire into the reasons why no single, fully-developed definition of "overgrazing" exists, and examine the consequences of this lack of precision. Finally, we offer a scientifically defensible definition of overgrazing and some results of its application in regional pastoral land management.

Introduction:

The development of “range management” as a scientific discipline is a relatively recent evolution of one of humanity’s most ancient practices. Its origins are multiple and various throughout the world. Historic grazing practices and agreements still form the foundations of many cultures, define national boundaries, provide a basis for law and even today create the essence of diverse social structures.

While graziers and grazing are found to be at the very origins of organized human society, grazing management (range management) as a professional discipline has entered the lexicon of analytical modern science only quite recently. It can be argued that the formalized, modern, scientific application of range management got its start in the European Colonial era,1876 to 1912 (Pakenham, 1991), thence evolving through the need to administer what was generally assumed to be “unmanaged” grazing resources in the Americas and in Europe’s mostly African colonies (Jardine, 1915; Stebbing, 1938; Aubréville, 1938,1949). Scientists and administrators from various disciplines were assigned the complex task of inventorying and managing vast landscapes often quite different from the climates and experiences in their own countries of origin: French West Africa, British Somaliland, Spanish Mexico, German Southwest Africa, Italian Abyssinia, and so forth. Many centuries of painstaking progress in social interaction, necessary for the successful and stable management of common grazing lands, were pushed aside in favor of anticipated miracles of modern (scientific) management. Added to this was the Colonial era’s notorious disregard for historical boundaries and tribalism, in favor of expedient administrative borders, many of which remain to the present day:

“Most of the early commentaries were based on normative interpretations of what the African farming landscape should look like, derived from casual roadside observations. Deviations from this ideal were then deemed to be in need of improvement. This ideal derived from several sources. The European aesthetic ideal of the tidy and ordered landscape was very powerful, as were scientific ideas about optimal farming methods imported from the temperate zones of Europe and North America.” (Scoones, I., “Politics, Polemics and Pasture in Southern Africa”, in The Lie of the Land, Leach and Mearns, eds., 1996)

As modern science expanded into the realm of range management, the underlying principles of vegetation biodynamics proved to be complex and challenging to researchers seeking to bring about the aforementioned miracles of scientific management. By the end of WWII, triumphs of technology in other disciplines raised expectations higher still, and breakthroughs were sought on a similarly grand scale for the great grazing regions of the world.

Reality has proven to be less kind. As the miracles have persistently failed to materialize, the blame has fallen on the traditional graziers, their methods and beliefs (Pole-Evans,1932; Rhodes,1991;Fairhead,1995; Delgado and Brown in Knight,2005). Until quite recently (Ellis and Swift, 1988), the possibility that the error might be on the side of modern science, was not openly considered.

Discussion:

The importance of terminology:
Historically, grazing has been the interface between humans and their natural environment, and even today this is a key factor in resource management theory and practice. All the more astonishing, therefore, that no single concise, testable definition of “grazing” exists, much less for “overgrazing”. From the colonial era onward no common effort to define this term developed despite its enormous implications for the lives and livelihoods of a great many societies on Earth (Campbell,1948; Dyksterhuis,1949; Range Term Glossary Committee,1964; Heady,1970; Lacey et.al.,1979; Scarnecchia et.al.,1982).
It continues to be widely *assumed* that “grazing” means “some combination of events related to mammals, generally domestic ungulate mammals, and their propensities for grass”. The implications are that non-ungulate and/or non-domestic mammals, or non-mammalian animals (grass carp, chickens, tortoises, ants, tree sloths, etc.) do something other than grazing, or do so on something other than grass forages.

To give this observation proper perspective, it might be well to consider other terms of global significance, and how a lack of precision and common understanding might have affected the world as we know it: the germ theory of disease, for instance, or celestial navigation, or electronics, or archaeology, or metallurgy; or mathematics. It would be an interesting world indeed, for example, if the term “speed of light” were considered to be a matter of opinion, conjecture and administrative regulation rather than the present, precisely-tested and proven foundation of particle and quantum physics. (“The Speed of Light: It’s not just a good idea – it’s the Law!”)

And yet this very predicament exists in land management . In the US, since 1905 researchers have been tasked with the duty of developing practical, scientifically valid “grazing systems” and refining these to the benefit of all – without defining what grazing is. Enormous resources have been committed since the 1870s worldwide, to develop and promote the best possible “grazing practices” (Jardine 1919; Pole-Evans 1932; Pechanec,1948; Aubréville,1949; Hickey,1969; Briske et.al.,1991). Lives and landscapes have been changed, and ancient societies transformed beyond recognition, on the basis of what have been little more than tentative theories without a common language.

The significance of government sponsorship:

The approach of government-sponsored grazing research in the U.S., and shortly thereafter in much of the rest of the world, (USDA 1895, Transvaal Dept. of Agriculture 1905, Union of South Africa, Rhodesia, 1932, Kenya 1938, etc.) focused on "grazing systems": bringing about a systematic orderliness that would measurably increase productivity while simultaneously safeguarding the land itself. There is little argument about the nobility of such a goal; however after many decades of scientific intervention around the world, much of it focused on (domestic) stock reduction schemes, an assessment is overdue:

"The fact that rotational grazing is still being promoted in southern Africa-in spite of more than 300 experiments carried out over 50 years or more, which have shown that it does not necessarily result in increased output [Gammon 1978, O'Connor 1985]- is testimony to the seductiveness of the simple solution and the fear of the unknown and more complex alternative." – Scoones,1996,

There is some reason to suspect that government sponsorship of field research has created unexpected pitfalls, not least of which is an inertia which makes changes in the direction of studies difficult. From the outset, State support of grazing systems research was on the highest order of human motivation; therefore any deviation from this path would diminish this motivation, at least in the eyes of administrators responsible for success. It followed that no real deviations from the approach at the time could be contemplated; therefore what researchers were attempting to do was good; therefore what indigenous, unlettered pastoralists were doing must necessarily be less than good. By degrees and by prejudice, pastoralists were perceived to be guilty of great crimes against the very lands they had inhabited and managed for centuries:

"The result of the laying waste of large areas of land by wasteful methods of cultivation and the increasing number of livestock has been a cry by the Natives for more and more land. More land would at best be a temporary palliative as present practices, if allowed to continue, would soon render the whole country well-nigh uninhabitable" – McIllwaine Commission of Enquiry, Southern Rhodesia, 1939

The result of a lack of a common terminology:

If any agreement among scientists was made defining 'grazing', and particularly 'overgrazing', there is no record of the event. The way was open for every research body to proceed on its own. A lack of commonality in grazing management arose from a similar lack of commonality in underlying thought between competing nations.

The result of this has not so much been a scientific meeting of minds, as rather a contest to establish whose administrative model will prevail. This practice is clearly seen, for example, in the ongoing contest between the public agencies of the United States, wherein negotiated administrative compromises have replaced scientific proofs, or even consensus (National Research Council, 1994). The net

effect of decades of global, negotiated, administrative compromises on grazing management, has been to bury the necessary scientific foundations, -- or worse, conceal their lack – beneath a growing body of regulation and documentation which is not, in fact, based on science, but rather on policy (Range Term Glossary Committee,1964; Forage and Grazing Terminology Committee, 1991).

Years, even decades of hard-data accumulation are frequently ignored or dismissed on the basis of a more recent administrative decision (Rocky Mountain Research Station, 2000), which in turn is superseded by yet a later administrative decision. In short, with the subtraction of scientific underpinnings, many global approaches to grazing management have devolved into an argument of opinions, in courtrooms instead of in real landscapes. Actual results have become no more important than the presentation or perception of them (UNEP,1984; World Bank,1996; Knight,2005).

Meanwhile, pastoralists remain blamed for the state of the land. It has been rare to find an aid-sponsored document which welcomes the experience of traditional pastoralists, or tries to build upon it (a rare exception can be found in UNOCHA, 2005). Far more common has been to acknowledge pastoralism only as an antiquated problem unable to react positively to “modern” life (Pole-Evans, 1932; Stebbing,1938; Aubreville,1949; USAID,1972; UNEP,1984; World Bank, 1996). Lost in the clutter is the painstaking accumulation of centuries of resource-use wisdom which, for example, allowed generations as recently as the 1960s to travel by foot, with herds, with confidence, six days or more between water points in Somaliland (Schwennesen, 2002), routinely set beneficial fires in supposedly vulnerable forests in the western US (RMRS, 2000), graze flocks and herds of enormous numbers by present standards for centuries in southern Africa, these without the direct, cause-effect consequences modern administrators continually warn of (UNEP,1984; Brown,Delgado,in Knight,2005).

Definitions

Even in cases where the definition of ‘grazing’ or ‘overgrazing’ is offered in the research literature, it is not a formally validated definition, but a utilitarian one. This is equivalent to physicists failing to define gravity, or geologists failing to define age.The results of land management interventions become relative; there is no validated standard against which to measure.

a. Grazing:
Since there are an infinite number of variations in grazing techniques, there is a general sense that no common definition is practicable. However, by reversing the perspective to the basis of the entity *being grazed* (the plant), instead of the multiple variables of *grazers*, a common definition is practicable, as presented here:

Definition: "Grazing" is the removal of tissue from a living plant.

("Browsing"is a term describing a specialized form of grazing.)

This dispenses with the complexities and inferences and assumptions which plague user-oriented definitions of the term, and also greatly broadens the scope of inquiry in terms of management. The term can be seen to apply, not just to domesticated ungulates, but to locusts, gardeners, birds, herds of wildebeest, tortoises, pastoralist women, fish, lawn-mowers, farmers and perhaps even fire. In all cases the effect on the grazed plant is similar. A clear field for testing and validation is offered, and applies to any plant, anywhere, at any time.

b. Overgrazing:
A cursory review of the published literature (see reference list) tends to define overgrazing – if at all, except as an accusation—on the basis, once again, of the entity causing the "overgrazing". This has led to some extraordinary published statements describing long-abandoned landscapes as overgrazed, or presently vigorous, healthy landscapes, as overgrazed. In fact any landscape not meeting the approval of the witness of the moment, where domestic animals can be shown to have been present, has at some point been described as overgrazed. This is subjectivity at its worst, and has no place in a scientific discipline.

In publications that venture a definition, overgrazing is generally defined as "to graze to excess" (Range Term Glossary Committee, 1964; Montana State University,2003), which is not helpful to science. If "overgrazing" indicates harm or damage, that harm must be measurable and documentable, and must also be clearly distinct from "grazing". "Overgrazing" demands evidence of harm; "grazing", by definition, acknowledges that harm is not implicit.

Overgrazing – without a concise definition -- has been singled out as one of the most destructive human influences on Earth (USAID,1972; UNEP,1984; World Bank,1996). Generally these judgements are handed down on the basis of domestic livestock numbers, on the *assumption* that large numbers of domestic livestock are the cause of overgrazing. Yet, early European accounts of the vast herds of non-domestic ungulates on the African savannas or the North American prairies, where the physical grazing effect is comparable, enthuse over the prodigious health and productivity of those landscapes, with animal numbers far beyond the "permissible" ones imposed today by policymakers.

We therefore revisit the definition of "overgrazing" using the foundation definition of 'grazing' ventured above as a reference point :

Definition;" Overgrazing" is the removal of tissue from a living plant, to the extent that the tissue removed exceeds the ability of the plant to replace it, within a growing season.

From the plant perspective, there is little practical distinction between one grazing entity (wild, domestic, mechanical or other) grazing a plant ten times, or ten grazing entities grazing a plant once – except in terms of the recovery time the plant is allowed, to reconstitute itself within its growing season (Savory,1999; Sayre,2001).

Viewed in this light, historically vast numbers of wildlife on a healthy landscape are easily explained: they had freedom of movement. Despite a century of administrative assumptions, overgrazing is not the result of some particular stocking rate. “Overgrazing” is the natural consequence of restricted movement, forcing plants to endure repeated grazing. It is “ *-- failure to remove or rotate animals --any number of animals-- in harmony with forage growth”* (Price, 1999)

Implications

There is a rapidly growing body within the international scientific community which has recognized the need for reassessment of grazing management. What has historically been regarded as good management by administrators and policymakers has of late been thrown into question. Scientific literature reveals more and more, an inclination to question poorly performing modes of grazing management, to review the long-term results of those modes of management, and conduct accurate accounting (Ellis and Swift, 1988; Hoffman and Cowling,1990; Behnke and Scoones,1991; Boutrais,1992; Fairhead,1995; Savory,1996; Leach and Mearns,1996; Sayre,2001; DDPA,2004). That accounting reveals some profound deficiencies: worldwide, calculated “carrying capacities” (terms under serious scrutiny as they imply a static productivity factor which is not stable) have been administratively reduced by increments for decades, to the extent that often, “allowable” domestic stocking rates have now fallen below subsistence levels for land users. At the same time, those reductions in “permissible” stocking have not been shown to have caused a significant improvement in land health or animal productivity (Rayburn,1992; National Research Council, 1994; Price,1999; MSU,2003; Heltzer et.al., 2005):

“There are few scientists or international administrators now who would defend the received narrative of desertification, although it lingers on in many government departments in dryland areas and some development agencies, and is often raised as a critical issue in project formulation in dry areas. A simple idea, adorned with powerful slogans, proves remarkably hard to change, even when shown to be patently inaccurate” – (J. Swift, 1996)

Future of Pastoralism

There is nothing more significant in resource management, than correctly understanding what grazing, and therefore overgrazing, actually are. The oldest known cultures on Earth have subsisted and thrived on an intuitive and relentlessly tested understanding of how animals use plants. A variety of events in recent history (technology, droughts, political changes, loss of ancient knowledge, shifts in economic pathways and "scientific policy") have led understanding away from the intuitive and towards the administrative, leading these same cultures to the brink of extinction. The predicament that pastoralists face worldwide today, is more grave than anything they have ever experienced (Swift, 1996, UNOCHA Global Pastoralist Gathering, 2005.) There appears to be no valid reason for this. It is the failure of science to recognize a testable truth, not the failure of pastoralism to obey regulations, which has brought the present crisis.

The practice of "nomadism", in the past often disparaged as a reflection of an antiquated way of life, in fact reflects provable, sustainable grazing and land management. As a practice it clearly reveals understanding of grazing and overgrazing in a way that modern "scientific policy" (there's an interesting term!) has so far failed to do.

There is a spark of hope for pastoralism. For one thing, the principles which underlie good resource management do not change, and can be applied as effectively today as they were a millennium ago. For another, there is evidence that science is finally waking to its responsibility to pursue truth, and is recognizing the validity of pastoralism and its methods of managing natural landscapes.

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