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PASTORAL DEVELOPMENT NETWORK

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IS 'HOLISTIC RESOURCE MANAGEMENT' THE ANSWER FOR AFRICAN RANGELANDS?

by

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In Pastoral Network Newsletter No. 23, mention was made of a workshop on 'Holistic Resource Management' held 15-17 December 1986 in Uppsala, Sweden. The workshop was organised on behalf of SIDA by the consulting firm Terra Nova and the Swedish University of Agricultural Sciences. Participants were mainly from Swedish universities and development agencies but also included a few individuals from Denmark, Norway, USA and Germany. The sole lecturer was Mr Allan Savory, the founder and director of the Centre for Holistic Resource Management in Albuquerque, New Mexico, USA. As the applicability of his resource management approach to the Sahelian zone in Africa was announced as a central question of the three-day workshop, a report about it may be of interest to a wider audience within the Pastoral Network.

Holistic Resource Management

Holistic Resource Management (HRM) has three major features:

- a thought model
- an assumption that four missing keys to understanding rangelands and environmental degradation have been found
- a method of grazing management called the Savory Grazing Method (SGM)

Our purpose in this brief paper is to examine these features critically, from the standpoint of their general applicability in Africa.

Thought model. The thought model is intended as a logical approach to solving ecological problems. It consists of a three-part goal (see diagram), which rests on four ecosystem blocks and is achieved by means of 'tools', the impact of which is assessed according to 'guidelines'. The thought model is applied in different modes: the analytic mode, mainly for use in crisis situations; the research-oriented mode; and the management mode. In the workshop, Savory concentrated on the management mode.

Savory claims that the thought model and the communication techniques used to work through it can be applied in pastoral and smallholder economies in Africa, but the concepts and techniques (e.g. 'brainstorming sessions', 'self-awareness', 'creativity enhancing methods') struck us as being very Western or, to be more exact, American. They would require substantial modification before they could be applied in traditional societies in Africa.

Nevertheless, the thought model can be regarded in a positive light as an attempt to overcome the shortcomings of a disciplinary approach to pastoral development. Aspects of the model could be integrated into similarly oriented approaches such as Farming Systems Research and the Development, Logical Framework Approach (known as ZOPP in Germany), interdisciplinary teamwork training, etc. The HRM thought model differs from these other approaches insofar as its principle stress is on ecological relationships. All of these approaches have in common, however, that they are means of using knowledge and information more effectively; they cannot replace sound knowledge of ecology, animal science and the social sciences. The fear that new management approaches may be used to camouflage practical ignorance of more recent scientific knowledge has been repeatedly voiced within development agencies as well as by external critics.

Another positive aspect of the HRM thought model is the emphasis on 'goal ownership'. Here, Savory means that the farmers/herders must be given the time and necessary assistance to become conscious of and to formulate their own development goals, so that they truly identify themselves with these goals. This idea is very welcome at a time when development workers are struggling with the concept of popular participation and how to generate it effectively.

Missing keys. The missing keys which the promoter of HRM claims to have discovered as aids in understanding rangeland ecology and the process of degradation are:

- holism,
- the concept of brittle and non-brittle environments,

- the importance of animal impact for regeneration of vegetation, particularly in arid environments, and
- the concept that overgrazing is a function of time rather than animal numbers.

Savory's explanation of holism during the workshop and in his various publications was somewhat vague. Apart from pointing to the thought model and stressing that the whole is more than the sum of the parts, he could only say (and write) that his concepts are based on a book by General Smuts, that it took him more than 20 years to begin to understand the concept, and that it is much too complicated to be explained in brief. The workshop participants agreed that a disciplinary approach to problems of environmental degradation has had little, if any, success; but simply emphasising 'holism' as a vague concept was not regarded as being sufficient for solving practical problems.

The concepts of brittle/non-brittle environments and animal impact were explained more concretely than 'holism'. Savory defines an environment as 'brittle' when the decay of organic material is slow and based mainly on chemical processes (oxidation); an environment is 'non-brittle' when the breakdown of old plant material is rapid and largely biological.

The slow breakdown of organic material in 'brittle' environments leads to an accumulation of litter, and eventually plants may die. Under extended rest, the spacing between the plants becomes wider, water infiltration decreases and run-off increases, leading to severe erosion. Heavy grazing, by contrast, results in a relatively dense though closely-cropped plant cover. Continuous overgrazing can destroy the vegetative cover and lead to erosion, but Savory's slides and comments suggested that continuous rest can lead to more severe environmental degradation than overgrazing.

'Non-brittle' environments, which are more common in temperate areas, react in a way which many specialists in pasture science and range management regard as universal. Resting of pasture leads to increased complexity and stability of the plant community, and overgrazing leads to degradation.

Savory admits that an entirely 'brittle' or 'non-brittle' environment is rarely found; most environments lie somewhere between these two extremes. We can give the example of rangelands in the semiarid tropics (e.g. the Sahel and Sudan zones), which have very fast, biological decay of litter during the short wet season, but very slow, mostly oxidising decay during the dry season. Savory does not offer guidelines for managing these and other important intermediate rangeland types. His dichotomy requires more thought and refinement to meet this need.

In 'brittle' environments, Savory maintains that animal impact can greatly help to maintain stability of the vegetation. Animal or herd impact occurs in natural rangelands with large populations of wild ungulates, mainly through rapid herd movement, e.g., a large herd fleeing from predators. The hoof action breaks up the soil surface and creates a favourable environment for plant germination. By contrast, slow animal movement is regarded as potentially harmful to the plant cover and soil surface.

In Savory's management system, herd impact is brought about by exciting the animals. For example, cattle are trained to react to the blowing of a whistle by running to a truck from which salt is fed. The effects were demonstrated in a series of slides taken before and after hoof action and after pasture regeneration. It would have been more convincing if additional data on dry matter yield, plant cover, species composition, etc. had been supplied.

The issue of hoof impact is currently being debated among American range managers. The general consensus is that the result of rapid and intense hoof action depends on vegetation type (perennial grasses, especially rhizomatous ones, respond well in the manner described by Savory; whereas legumes, annual grasses and browse shrubs do not) and on soil type (non-compacting sandy soils with shallow surface respond best, but fine deep loams are easily compacted and destroyed). Thus, this 'missing key' cannot be regarded as a general principle.

The hypothesis that the time factor is of greater importance than stock numbers with respect to overgrazing builds upon the work of A.

Voisin. Here, the definition of overgrazing does not apply to the entire vegetation (i.e. the pasture or range) but rather to individual plants. Light grazing stimulates plant growth, energy being supplied from assimilates in the remaining leaves. If grazing is too severe, renewed plant growth requires the sacrifice of root substance; at this point, a plant is overgrazed. It therefore follows, according to Savory, that plants cannot be overgrazed in the dry season, when grazing does not stimulate regrowth. It is doubtful whether this statement can be generalised, because grazing can also damage growth points of perennial grasses and - at least in semiarid or subhumid environments - perennial grasses which are grazed (or burned) in the dry season can exhibit new growth.

The recognition of the interplay between animal numbers and the timing of grazing has been the basis of various types of rotational and short duration grazing systems developed since the 1920s in Europe and America. While we consider that Savory is not saying anything new, he is helping to re-focus attention on the time factor in rangeland management.

Savory Grazing Method (SGM). The management strategy which results from Savory's above-mentioned 'discoveries' requires subdivision of a pasture or range into numerous, small units (either fenced paddocks or land units created by the herding of animals), each of which is grazed for only a very short period - in the growing season, only a few days. As soon as 'overgrazing' of individual plants of key species is observed, the animals are removed from that pasture area. According to Savory, this strategy is not a system of rotational grazing with regular movement of animals according to a fixed schedule; instead, it involves flexible grazing management based on close observation of vegetation, with attention being paid to ecological processes. Resting of the pasture units is based on the needs of perennial grasses: Savory suggested 30-90 days. If fencing is not used, this practice requires very strict herding discipline. In areas where range regeneration is desired (particularly in connection with land reclamation projects), hoof action is the major tool.

It is interesting to note that Voisin, in his Productivite de l'herbe first published in 1957, does not share Savory's aversion to the term 'rotational grazing'. He describes his method as a special case of pasture rotation. It would go too far here to enter into a detailed discussion of the relative merits of continuous and rotational grazing systems (cf. L.'t Mannetje, R.J. Jones & T.H. Stobbs, 1976, Pasture evaluation by grazing experiments, In: N.H. Shaw & W.W. Bryan, Tropical Pasture Research: Principles and Methods, Hurley, CAB, pp.194-234). However, the suggestion that a ranch be subdivided into as many as 100 paddocks will certainly be welcomed by manufacturers of fencing material. On such highly subdivided ranches, the cost of erecting and maintaining fences would be higher, in many cases, than the value of the grazing animals. Labour and money may be better spent on strategic use of fertilizer and oversowing of range with improved species, even in dry areas where the possibilities of pasture improvement are generally considered to be rather limited.

The main effect of the SGM will be on animal production per unit area, although Savory states that in drought years production per animal also will increase. The normally low weight gains on a per head basis are not surprising, considering that closely packed and excited (even running) animals probably take in less feed and expend more energy than animals in more easy-going grazing systems. Using animal impact in this way to improve the pasture may be appropriate in a ranching situation where stocking rates can be increased and controlled.

However, application of the SGM to a traditional pastoral production system, would face severe obstacles. Firstly, pastoralists would have to agree to removing stock from particular grazing areas in which there was still ample feed but only individual plants were 'overgrazed'. Secondly, the entire region used for grazing would have to be centrally managed, in contrast to the present system of traditional pasture use which involves very flexible and fairly independent management of individual herds without defined grazing areas for particular herds.

We are finally beginning to see some success with the developme it of

communally managed rangelands by a few herders' associations in Africa, such as in eastern Senegal and southern Burkino Faso. Although the grazing systems involved were uncomplicated and readily applicable, e.g. the simple separation of wet-season and dry-season pastures, they were nevertheless difficult to implement. We cannot visualise how Savory's tightly controlled and management-intensive grazing method could have been implemented in such situations.¹

Conclusion

As much as we agree that scientific range management may not deliver what it promises and that scientific experiments can never incorporate all variables of an entire production system, we do not support Savory's rejection of scientific examination of his 'missing keys'. We had the distinct impression that Savory considered it more effective to convert rather than to convince. However, although we felt ill at ease with the preaching style of presentation, we nevertheless feel that the content should not be rejected out of hand. The 'missing keys' may well help in our investigations and understanding of ecological degradation; they should be regarded as hypotheses deserving thorough testing on research stations and in the field.

To sum up, while the workshop opened up some new perspectives, in its present state of development HRM cannot be regarded as the key to practical range management and solving the problem of environmental degradation. It should be regarded, rather, as a set of highly interesting hypotheses which still need careful testing. Seen in this way, the workshop could be described as stimulating: we were forced to examine some conventional 'truths' of pasture and range management more critically. Furthermore, we all enjoyed the Swedish (SIDA/Terra Nova/Swedish University of Agricultural Sciences) hospitality, and appreciated the opportunity to exchange ideas and experiences with other people working in pastoral development.

¹ Here see PDN paper 23b by R. Sweet, 'The Communal Grazing Cell Experience in Botswana' - PDN editor.

Diagramme 1:

HOLISTIC RESOURCE MANAGEMENT MODEL

GOAL

QUALITY OF LIFE
PRODUCTION AND LANDSCAPE DESCRIPTION

ECOSYSTEM BLOCKS

Succession

Water Cycle

Mineral Cycle

Energy Flow

TOOLS

Money
&
Labor

Rest

Fire

Grazing

Animal
Impact

Living
Organisms

Technology

Human
Creativity

GUIDELINES

Whole
Eco-
System

Soc./Cul.
Aspects
Human
Resource
Skills
Organiza-
tion

Weak
Link

Cause
&
Effect

\$
Marginal
Reaction
Gross
Margin

Weath/
Energy
Source/
Use

Biological
Plan
&
Control

Time
Growth
Rate

Stock
Density

Herd
Effect

Popula-
tion
Manage-
ment

Burning

Flexibility
Strategic
Tactical
Opera-
tional

\$
Plan
Monitor
Control
Replan

Source: Savory,
unpublished manuscript