

Comments on Range Management Technical Assistance in the Middle East with Special Reference to Saudi Arabia

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Only in the period since World War II have governments in the Middle East devoted attention to ways and means of increasing range forage and livestock production on their arid lands. The need for such effort was readily apparent because overgrazing and droughts had resulted in the

starvation of livestock and hardship on the people. Range management or pasture experts were obtained from other parts of the world where programs to improve feed for livestock had been successful. These experts brought many suggestions from regions of generally higher rainfall and

cooler temperatures than arid areas of the Middle East. A number of land management practices were more or less modified for arid conditions. Unfortunately, most practices failed. Analysis of the successes, failures, and mistakes is needed for a sound range management philosophy in the Middle East.

This effort is urgent because modernization of arid land grazing cultures have not kept pace with advances in intensive agriculture and in other industries. Customs governed principally by natural environment, especially by a severe desert climate,

change slowly while those subject to technological, economic, and political control have changed rapidly. The problem is to understand and use the desert ecology so that the desert peoples can take a productive place in a nation-wide development. The caravan of civilization must not pass them by.

The lack of solid range management accomplishments seen in Saudi Arabia and described by others throughout the Middle East was more striking than unqualified successes. Therefore, my principal purpose is to ask why and to analyze the possible causes of failure. My second purpose is to suggest the broad outline of a program which, I believe, will change the balance toward more successful range management in the Middle East.

It may be presumptuous that a person without wide experience in the Middle East should be concerned with this subject matter. Extensive field observations were made during my six-month assignment as an FAO Pasture Expert in Saudi Arabia. Conversations with others who have wide experience in the Middle East and numerous reports, that often repeat each other, suggest that the conclusions apply generally to the Middle East. Undoubtedly, substantial local agreement exists and just as certainly exceptions are present. Sincere appreciation is expressed to *Dr. R. A. Peterson*, Chief of the Pasture and Fodder Crops Branch, FAO, Rome, who gave many helpful suggestions during the field work and for improving the manuscript.

Too Few Trained People

Range management, like any other science or practicing art, requires trained personnel. Few such persons exist in the Middle East. Lack of them is the most serious obstacle to range improvement. This prevents rapid growth in the range manage-

ment program and contributes to the mistakes. When an agricultural engineer undertakes a forage improvement program as a part of his duties, he is likely to fail. So is the range manager in an engineering project. The veterinarian may emphasize range livestock improvement by controlling disease and reducing death loss. However, increased numbers of animals overgraze ranges and reduce livestock production in the long run. The lack of trained men should be met through training and not by assigning people to do jobs for which they are not trained.

Range technicians can be trained in several ways. Promising young men should be sent abroad and teaching should be a part of the assignment of all visiting experts. At present, lack of counterpart personnel reduces the effectiveness of experts. Short-term personnel training in special courses would enhance the manpower supply, especially if it were a systematic program over a number of years that covered land management in depth. FAO working parties on the development of the grazing and fodder resources of the Near East discuss range problems, programs and actions. Certainly international exchange of ideas is a beginning. Training programs should be expanded immediately with the dual purpose of meeting the current shortage and to initiate teaching in range management at several of the universities in the Middle East through visiting professorships which encourage students and staff alike. Adequate training opportunities and facilities for Arabs within their own environment must be the ultimate goal. It can be attained most rapidly through several types of programs conducted simultaneously.

Lack of Grazing Control

Regulation of livestock numbers is absolutely essential to the

success of any range improvement practice. Overgrazing has materially reduced forage production throughout the arid areas. It is a regional problem. Overgrazing has destroyed all vegetation near villages and permanent water. It is also a local problem. Newly seeded areas, reforested areas, water control structures and other land improvement efforts have been destroyed because too many animals have grazed for too long a period. Proper grazing is every land manager's concern. The problem of livestock control must be solved before range improvement practices are initiated and not afterwards. In fact this one factor is so important that its solution frequently eliminates the need for other range improvement practices.

Control of livestock numbers is difficult to attain. Many people believe that the more animals they have, the wealthier they are. The more animals they have at the beginning of a drought the more they will have at the end of the drought. Emphasis in the market place is on the individual rather than its weight and quality. To control livestock numbers, social customs and human beliefs must be changed. A production philosophy is needed which includes efficient marketing and adequate returns to the producer.

Governmental regulations to control livestock numbers are unenforceable on a large scale without prior demonstration of benefits. This suggests two approaches. First, the size of area should be small enough that regulation can be accomplished. Village or tribal regulation has a better chance than national. Second, the demonstrational program should be effective. Primary concern should be with the latter. Range managers tend to think of improvement in terms of better distribution of water and grazing, supplemental feed

supplies, more forage, better quality forage, grazing systems, improved livestock management, and disease control. This isn't enough. Attaining a year-round balance of feed needs and supply, effective use of practices for educational purposes, and reasonable rules for regulation of grazing use must become a planned part from the beginning of every range management project. Range improvement practices should be used as tools to attain voluntary regulation of grazing use as well as devices to increase forage supply.

Even though overgrazing is the problem it must be realized that both regulation and educational efforts that concentrate on reduction of animal numbers are unpopular. A better approach is through increase in the amount of forage and animal production without an increase in the number of animals. The first step is to demonstrate the values of proper management on selected areas. The second phase is to spread the practices through agricultural extension procedures. Effective regulation at the national level, then, becomes possible.

Failures to Meet the Urgent Needs First

There is confusion concerning the immediate need. The lack of data about animals, soils, vegetation, water, plant growth, and all other aspects of the natural landscapes is frequently given as the main deterrent to range improvement in the Middle East. There is no argument that exact and detailed information is lacking to a large degree, and improvement practices are difficult to prescribe when conditions to be improved are inadequately known. A few studies are underway. But the question is still pertinent. Do these studies yield specific information that will help solve the most urgent range problems immediately? I fail to see the immediate practical use-

fulness, for example, of a vegetational map of Saudi Arabia. It would be most interesting information to have; it would be a valuable display for a lecture on Saudi Arabia; it would be useful in a University classroom; it will help in defining the resources and problems which will aid the Government in long range and nation-wide planning; but what good is it for gaining range improvement in the watershed of Wadi Ar'ar? Small scale efforts over large areas do not help immediately. The urgent need is for large scale efforts in small areas—a detailed study of Wadi Ar'ar.

Another suggestion that occurs in many reports on range improvement in the Middle East is to establish experimental pastures that test the influence of different stocking rates on animal and forage production. The immediate value of such work should be questioned on two points. Wide variation in precipitation results in wide variation in forage production so it takes several years to obtain stocking rate measurements which adequately characterize the average and the extremes in production. Knowledge about these parameters is useful but more important is how to deal with them in the year to year producing operation. Experiments to determine effects of stocking rate often do not give this information. A second point is that the forage produced, and hence the ideal stocking rate, is to a degree a result of other things such as kinds of animals; combinations of vegetation, soils and animals; season of grazing; and distribution of grazing. Since these factors vary greatly within short distances, stocking rate studies should be used to relate vegetational and animal responses to grazing pressure rather than to obtain an exact stocking rate for one area.

Still another kind of study that does little to give needed information is the nursery of forage

plants where the plots are irrigated to ensure plant establishment. Not much range land can be irrigated and if it can be the problems are quite different from those on dry ranges. A set of three by six meter plots marked by freshly painted white stakes and different shades of green contributed by numerous species is appealing to the eye and often to the man who controls the purse strings. But how can the surrounding desert be treated with flowing water? These kinds of studies show what can be accomplished with more water rather than new species best adapted to range conditions as they are. They certainly do not indicate new sources of water.

Definition of immediate need is a difficult question, or set of questions, to answer. Broadly stated it is the production of the most and best quality forage possible. It is also the most efficient use by animals of the forage produced. It is also efficient use of animals for human food. If a range is not producing at capacity, and most are not, the job is to find the causes and to eliminate them. Attacking them one at a time is ideal if the limiting one can be found and solved, but more likely, lasting success will be found in solving many inter-related limiting factors which combine into technological and social progress.

Range Improvement Programs Are Too Large

Range problems are usually regional in the Middle East and governments tend to look for nation-wide answers. Success is determined largely by the effort that is marshalled to meet a problem. For example, widespread overgrazing looms large or perhaps overwhelming to the single range man in a country. He tries, but his effort is too thinly spread to be effective. He could be effective on a small area, such as a district or a

watershed. Without, or until, adequate personnel are available it is better to solve problems on limited areas. Diluted work gets little accomplished.

Too Much Emphasis on Fundamental Research

In a newly developing country there may be a tendency to look upon lack of information as the principal problem and to the establishment of a research program as the way to meet that problem. Often the belief is held that the larger the establishment and the more fundamental the research the quicker troubles will be eliminated. Developing countries cannot afford extensive fundamental research and it should be left to those nations which have the facilities. Adaptation and application of existing knowledge are more urgent. Equipment for fundamental research is expensive to purchase and maintain—budgets in a developing country are small. Highly trained and skilled personnel are needed in the frontiers of research—such persons usually are not available. The problems have to a large degree been solved in the highly developed areas, otherwise, they wouldn't be highly developed.

Results in livestock improvement can be used to illustrate the need for careful planning of research projects. Many experiments have indicated that animals must have adequate feed to produce at their maximum potential and that animal potential cannot be determined without adequate feed. Breeding practices which aim at raising the potential cannot succeed until the needs for feed are fully met or until the animals are fed enough to respond to the greater potential obtained through breeding. Northern European breeds have been tried in pure lines and in crossings with native breeds in attempts to improve production of livestock in both humid and dry tropical

climates. The results of these efforts throughout the tropical world have been disappointing. There seems little point in repeating these experiments in the Middle East, except in limited areas where enough feed is available and climatic conditions are favorable for temperate breeds. Even so, alternatives of feed improvement, better day to day livestock handling, disease control practices, and solving other deficiencies must be considered. The latter are largely known so the livestock program will gain more with improvement of existing practices than with fundamental research into problems other countries are attacking.

Improper Modification of Practices

Modification of practices has two aspects that have contributed to range management failures in the Middle East. One is the failure to adapt or select practices borrowed from more temperate regions to local conditions. The second is to attempt too great changes in the local ways of doing things.

An example of the first is the preoccupation with reseeding. Nowhere in the world has range seeding been outstandingly successful in rainfalls less than 200 to 250 mm. No reason exists to expect success with seeding in those parts of the Middle East with less rainfall. Failures should have been predicted and reseeding approached cautiously, as, indeed, it now is.

Modification of pastoral nomadism illustrates the second. Much has been written on the virtues of eliminating nomadism on the arguments that nomadism destroys the forage crop and prevents social and economic progress. In Saudi Arabia, numerous examples suggest that year-long grazing in the vicinity of villages and permanent livestock water has caused more destruction of vegetation than migratory graz-

ing. Migration is a long standing range practice to avoid drought. As the forage supply is used, both animals and people move to new areas that have not been grazed. Theoretically, nomadic migration of livestock is similar to the use of rest periods that are commonly recommended for range improvement on ranches in semi-arid areas throughout the world. In this context, migrations are not synonymous with misuse of range land and they permit a high degree of use on desert areas. What, then, is the cause of range destruction under the nomadic system?

Probably the answer lies in a combination of too many livestock, too severe grazing use, or that the livestock remain in an area too long before the migrations occur. In common usage the term "migration" or "nomadic pastoralism" includes all aspects of grazing management, when in actual fact the numbers of animals in excess of the forage supply is the cause of the destruction rather than the single item of animals migrating. Syrian nomadic sheep population increases in favorable years and decreases in drought years. Resultant range destruction is attributable to too many animals and not to the migration system.

This is not to say that the present forms of migration are the best ones. Other systems may be more effective in using the forage efficiently. Certainly, the development of new water and of forage supplies in irrigated areas will necessitate revision of former migration routes and patterns of movement. So little information is available on nomadic grazing patterns and the effects of moderate forage use rates by migrating animals that changes in the system cannot be safely recommended. It hardly seems reasonable to eliminate pastoral nomadism when production from all land is needed.

Failure to Coordinate Range Improvement Efforts With National Programs

Range management practices cannot be successful in themselves. Range livestock production is a part of agriculture and depends upon and contributes to the whole agricultural economy in a country. It is also a part of a broader economic, sociological, and political structure. It depends upon that structure as well, so range management must be a part of widespread progress to have lasting success. To illustrate, any improvement in forage production must be used to increase livestock production. In turn the increased number or improved quality of livestock must be moved to market, through the market, and consumed. Failure in transportation of animals or meat, inadequate market facilities, and unacceptance by the consumer will affect the profitability and hence the success of the practice that produced the additional or better product. Failures in range management, or at least slow acceptance of efficient practices, are in part due to a lack of coordination between the strictly biological aspects and other phases of a developing economy. The limiting factors may not be biological in extensive areas of arid climates where development of roads, communications, health programs, schools, etc., is slow. Improvement of range resources and range livestock production can be effective only as an integral part of economic development in which all segments of

society progress together. Arid range land problems and practices are not in a vacuum and should serve as a focal point around which the desert society progresses.

Summary and Suggestions

Solving range land problems in the Middle East must include consideration of the following:

1. There are not enough trained personnel available locally or on an international basis to attack problems on a broad scale.

2. The production of range forage is decreasing but not uniformly. Destruction is especially severe near villages and permanent stock water locations.

3. Control of livestock numbers, season of grazing, and distribution of grazing use has not been attained, except in small areas.

4. Even though much practical information is available from temperate and more moist regions of the world, it has not been adequately adapted for use in the arid areas of the Middle East.

5. Deteriorated range conditions demand that first priority efforts should be aimed at practical problems. There is a serious lack of local information of all kinds but the great need to help the people suggests emphasis along practical lines rather than basic research.

6. Most problems are country-wide and need long-term concentrated effort, but the lack of personnel restricts work programs to limited areas.

7. Range land problems are closely related to economic, social, and political development in each country and must be attacked with due consideration of problems and progress in the country as a whole.

Failures in range management programs in the Middle East have been related to one or more of the above conditions, which also suggest the kind of program that has chances for success:

1. A few trained people can be recruited from outside the Middle East. They should have understudy personnel to train. Promising young men should be sent abroad for training and other educational programs should be initiated.

2. Efforts should concentrate on controlling animal numbers and on grazing management in small areas where other types of land improvement practices can be established.

3. Critical evaluation of introduced practices should be accomplished within a framework which emphasizes practical considerations.

4. In summary, range land improvement should be approached by a team that covers many aspects of biological, economic, and social problems. The team should concentrate its efforts locally and reasonably divide its work among those things which will give immediate success and those which require testing and extensive modification. Immediate successes build confidence and buy time needed to solve the larger problems.