

Can Rangeland Projects Survive Cost-Benefit Analysis?

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It is common, if not universal, practice for rangeland improvement projects proposed for public grazing lands to be evaluated using some form of cost-benefit or project analysis. In many cases the proposed project is rejected and as a result range deterioration continues. Those involved often criticize the methods of analyzing projects for not including all the social benefits. In response, much of the research in range economics has been directed toward better methods of identifying, evaluating, and quantifying the social benefits of projects. The insistence on a positive net social benefit from projects, however, is dangerous because the broad social goals for which government policy is conducted may be overlooked. In many analyses, the goals which the range improvement is expected to reach are not specified.

Range improvements are, after all, only one of the possible policy instruments which government can use to achieve its goals, yet range improvements are seldom evaluated against alternative policy instruments such as price supports or transportation subsidies on feed. As agencies responsible for range management must often compete with other government agencies for public funds, their policy instruments (i.e., range improvement projects) should be evaluated against the policy instruments of other agencies. If they are not, administrators responsible for the conservation and improvement of the rangeland resource are restricted by the decision rule of the cost-benefit analysis while officials of other agencies do not have to prove explicitly that their policies will provide a positive net social benefit. As a result range improvements may go undone, or worse, other agencies may initiate policies which lead to an accelerated pace of range degradation. Problems in the administration of range for commercial livestock may help to illustrate our point. In the process, some questions which may aid the range administrator in evaluating range improvement projects against other government programs may be suggested. Those interested in a more technical version should refer to Kerr and Dooley (1981).

At the most general level, the goals of government policy can be stated as social efficiency, equity, and continuance. In terms of agricultural policy these translate respectively into maintaining or increasing farm incomes (Barichello and Kennedy 1980), reducing the disparity of farm incomes (Crown and Heady 1972) and the conservation of renewable natural resources (Ciriacy-Wantrup 1952).

The need for range improvement projects often arises due to overgrazing by commercial livestock. Overgrazing, or

over-use of the range resource will arise under two situations:

- 1) where the user has sufficient resources for an adequate living but either through ignorance or design chooses to "mine" the resource to increase his current profits, or
- 2) where the user has too few resources to maintain an adequate standard of living (Johnson 1973) unless he "mines" the resource to permit himself sufficient income to survive.

In the former case, application and enforcement of reduced stocking rates provide the means to eliminate overgrazing or even enhance the quality of the range over the long run. The latter case, however, as anyone with experience enforcing stocking rates well knows, is a far more difficult problem (Kosco and Bartolome 1981). The range official becomes involved because there is a general goal of government to conserve renewable resources. Reducing stocking levels for users of the range who have insufficient resources, however, will mean that the individual will be forced out of business. The enforcement of conservation policies becomes difficult because it conflicts with the government goal of maintaining farm incomes. The support of farm incomes is certainly one of the major cornerstones of agricultural policy (Federal Task Force in Agriculture 1967). It is at this point that range improvement projects such as reseeding, brush clearing or wet meadow developments are often proposed. Such projects, if implemented, would satisfy both goals by reducing the pressure on the rangeland resource and providing additional resources to the user to allow him to remain on the ranch. The problem is solved if the range improvement project is implemented.

Most rangeland improvement projects, however, are subject to a conventional appraisal using some form of cost-benefit analysis. The decision as to whether the project is implemented depends whether it has a positive net present value, N.P.V. (a cost-benefit ratio greater than one, an acceptable internal rate of return or satisfies some other decision rule). If the project does not meet the requirements of the decision rule it is not implemented.

Unfortunately, most project appraisal methodologies cannot put a value on goals. If the project is not approved, however, the problem does not go away. The user of the rangeland resource still has an inadequate income (which is probably falling over time as the productivity of the range resource continues to decline) and the range will still be over-used. Those charged with the administration of the range resource do not have alternative policy instruments **which they can propose** because such policies lie outside their jurisdiction.

Other agencies of government, for example, departments of agriculture, are responsible for administering programs

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aimed solely at satisfying the income goal. Policies such as price supports, deficiency payments, tariffs, low interest loans, and input subsidies are some current examples. If the problem of falling incomes is of a general nature, then one or more of these policies will be implemented. Such policies are recognized as drains upon government treasuries or general costs to the society (Heady 1967). No one expects them to meet the criteria of cost-benefit analysis. They are only expected to achieve the goal of raising incomes.

Such policies have, however, measurable budgetary costs which can be considered as the net cost of achieving the goal of improving income. The major problem is that these net costs are seldom compared to the net costs of range improvement projects (as represented by the negative net present value of the projects). In many cases one would expect that the net cost of rangeland improvement projects would be less than the cost of general income support programs. There are a number of reasons for this. First, it has been politically and administratively almost impossible to limit income support policies to those who really need them. The unpopularity of welfare-type direct income transfers based on need, in the agricultural community, has meant that income support policies attempt to affect prices in the market. Price supports, deficiency payments, or tariffs affect the output price for all producers of the product, irrespective of income. Subsidies on interest, transportation, or irrigation usually apply to all producers. Improvement projects, on the other hand, can be more easily applied on the basis of need.

Further, subsidy and support policies tend to be ongoing as they do not attack the problem of too few resources but only treat the symptom, low incomes. Range improvement projects, on the other hand, help expand the resource base of the ranch. The questions, then, to be asked by the range administrator, when faced with a range improvement project with a negative net present value, are: What alternative programs are available to solve the problem? and, How much will the alternative programs cost?

Policies such as price supports and subsidies which are applied to all producers, irrespective of their income, have been widely criticized because they tend to help most those who do not need help at all. A price support on sheep will provide the same subsidy per animal for a producer with 10,000 head as for a producer with 100 head. According to Heady (1967), "The programs now used also distribute payments and gains mainly to large farmers who have higher incomes." As it is a generally recognized goal of government policy to promote a more equitable distribution of income (Barichello and Kennedy 1980, Crown and Heady 1972), the further implementation of such universal policies would seem to contradict this goal. The question becomes: Will the alternative programs only help those ranchers who really need it?

Elementary economic analysis suggests also that policies which either raise the price of output or lower the price of inputs tend to bring about an increase in production by producers. Increased use to increase production from an over-used piece of rangeland can only speed up the rate of degradation. Therefore, a further question is suggested: Will

the alternative program stimulate production and increase the pace of degradation for the renewable rangeland resource?

Of course, if there are alternative programs which do not oppose the general goals of government policy, then they must be compared using N.P.V. calculations (Pitt and Kerr 1977). Range projects therefore should be evaluated, not only against an arbitrary decision rule but also in the context of the broader goals of government and the alternative policies which can be used to satisfy those goals. Range improvement projects will not always be the most efficient method of solving the problem, and range administrators should be willing to inform decision makers of more efficient uses of society's resources.

In summary then, when faced with an apparently uneconomic range improvement project, the range administrator should not file the report and forget about the project. Instead he should be prepared to ask a number of questions both of himself and of those ultimately charged with policy decisions. These questions are:

- 1) What are the relevant goals of government policy?
- 2) What alternative programs are available to solve the problem?
- 3) How much will the alternative programs cost?
- 4) Will the alternative programs only help those ranchers who really need it?
- 5) Will the alternative programs stimulate production and increase the pace of degradation for the renewable rangeland resource?

In the context of these questions, range improvement projects are likely to appear in a more favourable light. Range economists can provide both qualitative and quantitative answers to these questions and help the range administrator be better prepared to present his case to decision makers. Of course, this is only one example where a conflict of goals may arise, and similar questions may be suggested for other concerns such as wildlife-domestic livestock conflicts, range-forestry conflicts or recreation-agriculture conflicts.

Literature Cited

- Barichello, R.R., and G. Kennedy.** 1980. A goal framework for policy decisions, Discussion Paper No. 80-01, Dep. Agr. Econ., Univ. British Columbia.
- Ciriacy-Wantrup, S.V.** 1952. Resource conservation economics and policies. Berkeley, Univ. California Press, 389 p.
- Crown, R.W., and E.O. Heady.** 1972. Policy integration in Canadian agriculture, Ames, Iowa State Univ. Press, 230 p.
- Federal Task Force on Agriculture** 1969, Ottawa, 475 p.
- Heady, E.O.** 1967. Funds and policies of agriculture in the U.S.A., In: J. Ashton and S.J. Rogers, Economic Change in Agriculture, Edinburgh, Oliver Byrd, 209-228.
- Johnson, D.G.** 1973. World Agriculture in Disarray. London, Mac-Millan, 296 p.
- Kerr and Dooley.** 1981. Range-livestock economics—a perspective and guide for rangeland administrators, Discussion Paper 64, Dep. Econ., Univ. Calgary, Calgary, Alberta.
- Kosco, B.H., and J.W. Bartolome.** 1981. Forest grazing: past and future, J. Range Manage. 34:248-251.
- Pitt, M.D., and W.A. Kerr.** 1977. Range improvements, economics and financially marginal ranching units, J. Range Manage. 31:204-208