CAN THE RESTORATION OF DEGRADED RANGELANDS EVER BE ECONOMIC?

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ABSTRACT

Degradation of rangeland pastures in Australia is widespread and ongoing. The characteristics of many restoration technologies in relation to land values contribute to a perception of their being uneconomic. However, while this might be true within the general context of broadscale application, it need not be the case in specific instances. Both the underlying contexts and processes need to be considered in assessing the economic value of a given restoration technique for a given degradation problem.

KEYWORDS

cost-benefit analysis, rangeland degradation, context

INTRODUCTION

The degradation of rangelands in Australia is widespread and, despite advances in restoration technology and increased community conservation initiatives (e.g. Decade of LandCare), is continuing to occur over wide scales (Tothill and Gillies 1992). Nevertheless, these same resources underpin a significant proportion of the national income attributed to agricultural production. In fact, the two processes (current economic exploitation and degradation of future productivity) are argued to be linked by many rangeland scientists and policy-makers.

The question of the economic value of restoring degraded rangeland, as posed in the title, is rhetorical. At face value, the answer would seem to be in the negative. It would, otherwise, be hard to understand why rational private decision makers (i.e. pastoralists) or the broader community are prepared to accept the ongoing degradation. The few economic studies that have specifically examined restoration technologies within a consistent cost-benefit analytical framework have also generally pointed to a poor economic performance for their widescale application (e.g. MacLeod and Johnston 1991). However, the *process* and *context* within which the degradation is occurring and for which restoration will apply is rarely accounted for in such studies. When these are factored into management and policy decision-making, the answer may more often be an encouraging one.

ECONOMIC EVALUATION OF RESTORATION TECHNOLOGY

Degradation processes usually occur over periods of time, although this can be punctuated (MacLeod *et al.* 1993). Restoration technologies typically involve the commitment of resources at different times (e.g. capital works, reinforcement and maintenance treatments) and benefits generally accrue into the future, commonly as avoided income losses. Therefore, time dependent and consistent analytical techniques such as capital budgeting (cost-benefit analysis) are recommended to evaluate the economic value of such technologies (e.g. Workman 1986). This involves the application of discount factors to sequences of cost and benefit streams associated with the particular degradation process and restoration practice to calculate net present values, cost-benefit ratios and internal rates of return.

The discounting calculus tends to highlight a number of characteristics of rangeland restoration technologies that contributes to their generally poor performance relative to many other investment classes (MacLeod and Johnston 1991, MacLeod *et al.* 1993). For example, costs incurred (especially for mechanical and chemical treatments) are usually high relative to the production value of many rangeland pastures and improved animal performance is often slow to manifest itself after treatment, particularly where spelling or limited restocking is required to guarantee treatment effectiveness. Discounting weights most heavily against more distant future sums and least heavily against more immediate sums, thereby amplifying the relative cost to benefit disadvantage of management intensive technologies. Low cost to benefit technologies, exemplified by prescribed fire in semi-arid rangeland pastures, often carry substantial downside risks of low treatment efficiency when seasonal or management factors are not conducive to short cycle serial application (Noble *et al.* 1993).

CONTEXT AND PROCESS OF RESTORATION TECHNOLOGIES

Many restoration economics studies paint a vicious cycle of a high and unwarranted cost to restore lands of generally low pre-degradation productive value. This is most likely true for broad scale treatment of severely degraded rangelands. Restoration may indeed be uneconomic and the most appropriate management strategy is to avoid further degradation. However, this conclusion does commonly relate to a fairly narrow context. It is also reflective of a problem associated with the need to generalise and/or publish the findings of restoration technology research projects centred on small scale treatments to a wider management context - via the so called “dollar bottom line”. These typically involve a limited hypothetical scenario, set to a typical paddock, and lack details of context to the broader enterprise or whole-property context. Moreover, they rarely depict the actual processes by which the degradation to be treated is occurring or the dynamic nature of the problem post-treatment - is it permanently fixed or merely contained and capable of re-emerging?

When the context and process of a particular degradation problem and remedial treatment are specifically accounted for, the bleak economic picture at the more aggregated level may be brighter. Some degradation problems may be uneconomic to treat. For example, those which emerge at a low density over a broad-scale and for which treatment effectiveness and application costs are directly related to density as is commonly the case with shrub encroachment. However, even these might be addressed economically through co-operative or public action which can exploit economies of scale (MacLeod and Johnston 1991). In contexts where problem emergence is concentrated and capable of rapid or broad-scale spread, or where treatment can lead to (near or) permanent removal of the threat, the economic benefit of a treatment that may otherwise be uneconomic for broad-scale application may, in fact, be economic. In other cases, treatment of a severely degraded area may promote an opportunity to remove a constraint on overall enterprise performance. For example, water ponding of severely scalded rangelands has a reputation for being uneconomic (MacLeod and Johnston 1991). However, used strategically, it may provide quality feed to sensitive animal classes at critical times, thereby raising the overall profitability of the total livestock enterprise. Finally, the integration of potentially ineffective or uneconomic treatments into packages that provide treatment effectiveness through emergent properties or compounding efficiency are an underpinning element of integrated reclamation systems such as IBMS (Noble *et al.* 1992).

CONCLUSION

We acknowledge that restoration of degraded rangelands is generally problematic, from an economic and ecological sense. The ideal remains to avoid degradation in the first instance through widespread adherence to sustainable land management practices. However, much rangeland is now degraded and we are concerned that blanket generalisations may too readily be made concerning the specific merit of individual technologies which might otherwise be brought to bear on restoration. The processes and context underlying individual cases should not be ignored.

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