New Directions in Environmental Policy

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Abstract: That environmental policy to date has failed to deliver sufficient returns to the community is a widely held belief. This paper seeks to shed some light on the possible causes for incumbent policy failures and also to posit the addition of a new set of tools that can facilitate a more targeted and coherent approach to policy in the entire environmental landscape. The role of markets as institutions that facilitate the gathering of agents to create value is explored in the context of the environment. In particular, the potential benefits of designing market institutions that address the inherent informational constraints in environmental problems is explored.

Why is there an environmental problem?

In order to adequately assess the state of environmental policy, and to posit changes in that policy, we must start with an understanding of the genesis of environmental problems themselves. At a macro level, economic growth and population growth lead to an increase in demand for most resources. Furthermore, if resources are in fixed or limited supply, as is the case with most environmental goods, then this tends to lead to scarcity. Environmental goods are mostly normal goods – the value that people place on them rises with income (and with education). As such, it is likely that the social value of environmental resources will continue to increase rapidly.

Many goods are effectively priced and marketed in the economy, but many are not. The economic (or social) value of marketed goods is generally reflected in their market value, and (with some exceptions that are well understood by economists) market mechanisms lead to an efficient use of resources that maps scarcity and changing valuations. Of course this does not apply to non-marketed resources. In the realm of the environmental landscape there are many resources that are not adequately valued through the market system. Environmental resources often yield multiple outputs, some valued by the market while others are not. A forest can produce timber or habitat for small mammals. Similarly, farmland can produce crops or migration refuge for birds. Rising demand for the marketed products is evident in increasing prices, and in ever increasing pressures for exploitation. The social value of the non-marketed outputs may be rising (or falling, in the case of bads like greenhouse emissions) even more rapidly, but these values do not have a voice in the marketed part of the economy. The result is a squeeze on environmental resources.

There are two broad policy approaches to dealing with this problem. One is to put a fence around the marketed part of the economy, in order to protect the environment. This is a natural reaction, and it is the basis for a great deal of existing policy. The other is to try and change the boundary between the marketed and non-marketed part of the economy, curing the problem at its root. A combination of both approaches will probably always be optimal. The thesis of this paper is that new developments in science, technology and in economic theory allow us to shift the boundary in ways that were not possible before, and that we can see this change in a number of exciting new environmental policy initiatives.

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Existing policy approaches and their limitations

Policy makers have long recognised the economic and political constraints in executing "good" environmental policy. In short, the critical components being the definition of "good" and the efficient implementation of the policy. Moreover, the changing consumer preferences over environmental goods has rendered the accurate determination of the normative issues associated with formulating "good" policy itself difficult, let alone the enormity of the task of implementing it.

Economics, as a discipline that enables structures to be placed around the process of decision making in various contexts, has been part of the toolkit of policymakers in environmental and other domains. But where policy formulation and implementation has failed is when these structures have been poorly applied. In the past, environmental policy methodology has typically fallen under either command and control (CAC) procedures (ie, putting a fence around the marketed part of the economy) or market based incentive mechanisms (MBIM). The informational and transactions cost burden of the regulatory approach to achieving environmental objectives has led to advances in the application of alternative market based methods. That effective environmental policy will require a portfolio of CAC and MBIM is the conventional wisdom from the experience of the past decade.

Governments around the world are wrestling with the changing issues associated with the use and degradation of natural resources. The broad gambit of concerns include, current and future viability of natural resources (sustainability), appropriate valuation methodologies for environmental assets, and transboundary degradation. An important common thread across these is that of opportunity cost. Farming land today has an associated opportunity cost in terms of viability of that land in the future. There is much debate on the monetisation of these costs as they require some weighting of current versus future use (in economics parlance there is no agreement on the appropriate "discount rate"). Similarly, farming land may entail some loss of biodiversity, and this too requires some method for evaluating the implicit costs. Finally, the transboundary concerns highlight the fact that the opportunity cost of degradation need not be internalised by nations, let alone firms.

The complexity of environmental policy reform need not render the task unassailable. What is required is a systematic approach to addressing the concerns around use of natural resources, not merely a politically expedient one. Environmental policy around the world, to date, has suffered from some common pitfalls. Firstly, there has tended to be an incoherent, partial and piecemeal approach to the environmental landscape. Biodiversity, water quality, dryland salinity, forestry, genetically modified organisms, pollution, farming etc. cannot be viewed as individual concerns that warrant policy directives that address the political and economic considerations in isolation. It is tempting to suggest that in order to rectify the dryland salinity problems of the Murray Darling Basin, x million trees should be planted. Or that, without regulating farming practices radically, biodiversity loss will be enormous. Deforestation of our state forests will make certain species extinct, or that restriction on access to timber resources will cost the state x thousand jobs. Each case tends to be judged on its peculiar merits, and the application of policy is contextual. In short, it is often piecemeal rather than guided by general rules. What is often missing in the current environmental policy discussions is a well developed schematic for understanding the multiple attributes of environmental assets. From a societal perspective what is required from our policy makers is a methodology for assessing the tradeoffs associated in using natural resources and their impact on the environmental landscape.

Secondly, policy directives have often failed to take into account the incentives of individual agents, and the way that policy changes, or does not change, behaviour. Thirdly, dichotomising policy formulation from implementation has often resulted in a failure to adequately think through the informational requirements of implementation, let alone the design issues that would result in optimal implementation from the perspective of learning. Finally, an important aspect of environmental policy implementation, related to ex-ante cost benefit analysis, is an ex-post measurement and accountability of the proposed environmental reform. Successive governments at both State and Federal levels have allocated enormous amounts to environmental concerns. Sadly, there has been little accountability on the public purse, both in terms of proposed change and on the effectiveness of policies that are implemented. A systematic method of ranking environmental policy directives in a cost-benefit analysis would yield not merely more efficient outcomes, but also provide some discipline to the environmental reform agenda. This is particularly important when we recognise that one of the necessary limitations to policy reform is the institutional framework within which it is administered. The scope for rent seeking behaviour distorting decision making in the political arena is well understood, but a similar arena of rent-seeking exits at the institutional level.

A new policy framework

Managing the environmental landscape, and its implications for policy, are in some respects similar to management of any capital asset. Where traditional markets are insufficient institutions is in their failure to adequately reflect externalities and social costs. The necessary components of a coherent policy framework must begin with a diagnosis of the environmental landscape and the potential problems in its management. Further, a clear delineation of the feasible policy objectives that are gleaned from scientific research and market information, needs to be coupled with the design requirements of potential implementation methods. A critical component, missing in the current policy domain, is the need for a transparent, open policy design process that is subject to criticism and peer review. Moreover, the ex-post monitoring and evaluation of outcomes is an important plank of environmental reform. The move towards a coherent, transparent and integrated policy framework for management of the environmental landscape would entail input from scientists, engineers , economists and other specialists.

The Role of Markets

Economists have long recognised that the market process has implications for human behaviour. In redesigning the environmental policy framework we are suggesting recourse to scientific and economic theory to push out the boundary between the marketed and non-marketed parts of the economy. If well designed, and operating efficiently, markets provide a harmonisation of values, decisions and actions. This is the oft-cited discipline of the market process. On the supply side, when dealing with environmental goods, the direct effect of the market is the ability to procure at least cost. An important indirect effect of the market process is behaviour changes that occur from involvement in the market itself. That is, price signals in a market for biodiversity conservation yields not just conservation at least cost, but an awareness of previously unpriced environmental assets that may impact on behaviour in other parts of the environmental landscape. Similarly, on the demand side, the market process forces a reallocation of conservation efforts to where the value is the greatest. A further benefit of market in environmental goods is the possibility of cooperation and teamwork between different programs and the recognition of the opportunity costs of pursuing one

program over another. Finally, from the information revelation perspective, the full social value of environmental resources becomes evident through the market process, as well as the costs of enhancing them. This is a valuable input into policy design.

It is unlikely that the simple introduction of markets, no matter how well designed, will completely correct the problem, thus some government management and fine-tuning will be required. This is because of the existence of market failures such as the existence of monopoly power. These market failures are well understood by economists, and there are standard techniques to correct for them. Moreover, the government involvement in the domain of relative valuations across generations and across national boundaries will be ongoing.

Coase (1937) identified "transaction cost" as the main obstacle to the existence of markets. Today this vague concept is better understood, and it is known that information problems lie at the root of most missing markets. Once this is understood, there is the possibility of addressing the problem directly through the use of modern technology and clever institutional design. The basic reason that asymmetric information destroys markets is that it is hazardous to do business with someone who has relevant but hidden information. The uninformed party is liable to be exploited, and may be unwilling to participate. Because of this, the potential benefits of doing business (which may be very large) may not be realised. For example, sellers of organically grown produce may not find a market because the uninformed public is liable to be cheated by fraudulent products. The answer in this example has been to create a certifying body that corrects the information imbalance, and this is typical of the intervention that is required. Something must be done to improve the information structure in order for the market to work effectively.

In the case of environmental policy, the uninformed party has overwhelmingly been the general public. If the contributing public does not know how the money has been spent, how much has been dissipated in administrative inefficiency, what has actually been done on the ground, and whether there is any link between the actions and environmental outcomes, then there can be no confidence. This lack of confidence may be one reason why volunteerism has been important in the provision of environmental goods (eg, Landcare, anti-litter clean ups). Although voluntary action may not be very efficient, the volunteer can at least monitor it. It is our thesis that public willingness to pay for environmental assets is greatly diminished by the informational asymmetries that are inherent in many environmental issues. It is for this reason that transparent and objective program evaluation is a key step in improving the management of the environmental landscape.

The types of informational failure, and the ways in which they might be addressed, are numerous. To illustrate the broad issues around information in an environmental context consider the case of Bushtender. The environmental good in question is biodiversity. The cost of providing the good may be hidden. This can be addressed through the market design (the auction). The initial environmental state may be unknown. This can be addressed through scientific innovations or by remote sensing and/or on site monitoring. It may be unknown whether the contracted actions have been undertaken. This can be addressed through monitoring, and also through an output based component to compensation. The balance between rewarding on the basis of inputs and outcomes would depend on the relative difficulties of monitoring these, and the risk burden on the supplier. Since the causal links between actions and outcomes are probably not well understood, scientific research and monitoring may be used. The environmental value of

the good (value to the buyer) may not be known. This can be addressed through a tendering market on the demand side, or through Coasian bargaining between different demand interests. Finally, the effectiveness of the implementation package (ie, the incentive/market measures and the link between actions and outcomes) may be unclear. This can be addressed by ex-post evaluation.

Conclusions

Managing the environmental landscape is a complicated endeavour that requires a coherent integrated policy design process. A major lesson learnt from past failures is that policy design needs to be system wide not ad hoc, and that it requires the input of scientists, economists and other specialists. Planned or regulatory approaches to management of the environmental landscape do not incorporate the informational asymmetries inherent in the system. By using inventive market based mechanisms to reveal hidden information coupled with scientific research on use and degradation of environmental assets, a more effective approach to environmental policy can be undertaken. In ascertaining the appropriate ranking of different possible uses of natural resources in the context of their impacts on the environmental landscape, appropriate measures for opportunity cost need to be revealed. In some dimensions this lies in the domain of scientific endeavour, while in others, information of this sort lies in the hands of individual agents in society. Moreover, recourse to economic theory to help develop methods for constructing market institutions that efficiently reveal and aggregate information, will push out the policy frontier (ie, the fence between the marketed and non-marketed parts of the economy can be pushed further out). Finally, there are some significant obstacles to new environmental policy design and implementation. The most obvious is that incumbent decision makers within the current institutional setting may be reluctant to adopt methods that potentially whittle away the opportunity to appropriate political or institutional rents. As important as well designed policy is the institutional support for efficient implementation.

About the Authors

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Background

Peter Bardsley is Professor of Economics and Director of the Economic Theory Centre at the University of Melbourne. He has previously held positions at La Trobe University, at the (then) Victorian Department of Agriculture and Rural Affairs and, in the 1980's, and also at ABARE.

Associate Professor **Vivek Chaudhri** joined the Melbourne Business School after completing his Ph.D. in economics from Yale University. He has taught the core managerial economics courses, and electives in the field of economics and strategy at the Business School. He has an active research agenda spanning the domains of game theory, industrial organisation, finance and business strategy and publishes in international journals in these fields. He has previously worked on consulting assignments to the public and private sector including: Economic Planning Advisory Council of Australia, Ernst & Young's Economic Consulting Group (Washington D.C.), AMP Investments, Chase Manhattan Bank, Salomon Smith Barney (Singapore), TXU Trading , Department of Natural Resources and Environment and CBS Entertainment (New York).

Gary Stoneham holds the position of Chief Economist in the Department of Natural Resources and Environment in Victoria. In NRE, Gary defines his role as the development and implementation of contemporary approaches to environmental, natural resource and commodity policy in Victoria. Gary has formal training in agricultural economics and natural resource economics. He has previously worked for ABARE as a research economist and very briefly as an economist in the Queensland Department of Primary Industries.