

REVIEW ARTICLE

REGIONAL ENVIRONMENTAL MANAGEMENT: LESSONS FROM THE HUNTER VALLEY *

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- * A review article of A.J. Jakeman and R.W. Simpson, **Air Quality and Resource Development — A Risk Assessment in the Hunter Region in Australia**, (Centre for Resource and Environmental Studies, Canberra, 1987), pp. xxiii + 315. ISBN 0 86740 150 8; Frances Perkins, **Manpower and Resource Development: The Case of the Hunter Region, NSW**, (Centre for Resource and Environmental Studies, Canberra, 1985), pp. xvi + 1987. ISBN 0 86740 139 7; A.K. Dragun, V. Gleeson and W.F. Musgrave, **The Economics of Water Use in the Hunter Region**, (Centre for Resource and Environmental Studies, Canberra, 1986), pp. xvi + 148. ISBN 0 86740 140 0; Diana G. Day, **Water and Coal: Industry, Environment and Institutions in the Hunter Valley NSW**, (Centre for Resource and Environmental Studies, Canberra, 1986), pp. xx + 324. ISBN 0 86740 141 9; and A.J. Jakeman, P.K. Parker, J. Formby and D. Day (eds.), **Resource Development and Environmental Issues: Opportunities and Constraints in the Hunter Region, NSW**, (Centre for Resource and Environmental Studies, Canberra, 1987), pp. xvii + 369. ISBN 0 86740 211 3.

These five information-rich, tightly-argued monographs provide an effective report on the most comprehensive, sophisticated and successful regional appraisal of environmental problems and policies yet undertaken in Australia. When compared with its equally ambitious predecessor, the Botany Bay Project, the Hunter Regional Study demonstrates a clear leap in capabilities for regional assessment and policy analysis in the ensuing decade. The study is particularly strong in its authoritative assessments of environmental and social consequences of resource developments and its incisive critiques of the performance of public institutions in policy and management decision-making.

The research problem and general approach are aptly outlined in the final monograph, quoted here at length: "The public choice dilemma facing the Hunter region is that on one hand it contains substantial energy resources and that the strategy of the New South Wales government for almost a decade has been to develop those resources not just for export, but to attract energy-intensive industries to the region. This strategy has been an attempt, at least in part, to ease the high unemployment level and to offset the decline of traditional manufacturing activity within the state and region. On the other hand, there has been no comprehensive assessment of potential cumulative social and environmental effects of continued resource development within the region."

“Clearly, a valuable study would be one which assessed the overall impact of current development and future development options, balancing benefits of development against direct costs such as capital investment, infrastructure, labour, water requirements used in alternative situations, and indirect costs from environmental degradation and social disruption . . . In responding to this challenge of providing a useful regional assessment, the CRES approach was first to identify major points of conflict and public choice where coal production interacted with the environment, social values, political priorities, international economic forces and institutional constraints. The associated public policy issues are then considered within the context of public choices between options and an estimation of the limits to growth of resource development”. (Jakeman et. al. p.12)

The CRES team has been unusually successful in its pursuit of these goals. This success is a product of a high level of individual competencies, effectively directed towards the pursuit of shared, well-defined goals. Each monograph is an impressive individual contribution; together they form an imposing assemblage, lifting the standard of environmental and social assessment to a level well above that previously attained in Australia.

Air Quality and Resource Development, by A.J. Jakeman, and R.W. Simpson, is an authoritative study, effectively traversing a diverse array of methodological, conceptual and policy-related issues, well revealing the expertise and versatility of its writers. The Hunter Study clearly presented them with the appropriate challenge, to engage in a series of distinct yet interrelated tasks in risk assessment, in identifying, measuring and modelling pollution sources and ambient air quality, in surveys of environmental attitudes and perceptions, in simulation scenarios, in assessing costs and benefits and in appraising policy options. In meeting these challenges, the authors have transformed their comprehensive case study into an authoritative text, well suited for use by advanced students in resource management.

For readers of *Prometheus* two areas deserve attention. The first of these is the authors' effective adaptation and extension of risk assessment methods as a superior alternative to impact assessment. Modelling strategies are related to assessment objectives and to data limitations, with hybrid stochastic models employed to account for uncertainty. Risk evaluation involves the modelling of a complex series of systems, comprising a usually well-defined pollution system, a poorly defined physico-chemical transport system and an ill-defined impact system. Much of the book is devoted to data-analysis and modelling of these systems, in a mixed array of research contexts within the study area.

The second noteworthy contribution is in their informed, sensible scrutiny of policy options, with an examination of various alternatives under the broad groupings of moral suasion, direct controls, price incentives and government investment, as specified by Baumol and Oates. In their related discussion of costs and benefits, the authors adopt an anthropocentric view, with attention to amenity.

The authors present a formidable series of detailed recommendations, well-directed towards prodding political and administrative systems into a series of very specific monitoring, modelling, remedial and control measures, directed towards local and regional sources and impacts.

In **Manpower and Resource Development**, Frances Perkins demonstrates the value of using a regional case study as a launching pad for a wide-ranging critical review of Australian manpower policies. Section 1 of her monograph focusses on the Hunter Valley, providing a well-informed, conventional labour market analysis, scrutinising evidence on geographical and/or skill mismatching, particularly of skilled tradesmen, as the regional economy wavered in its superimposition of new resource/energy industries on a declining traditional manufacturing base. Perkins presents a cumulated series of employment scenarios to year 2000, together with regional multipliers, in order to identify potential imbalances by occupation and skill. Given its authoritative stance and reliance on detailed data displays, it is disconcerting to note clear errors in several figures, e.g. the incorrect plotting of rate of increase in Fig.3 and the mathematically impossible declining ogive curve in Fig.5, while the vast series of figures showing projections to year 2000 give an entirely false impression of trends by the amateurish double-switch in the horizontal time-scale. Even more annoying was the complete absence of the microfiche containing 30 tables, regularly referred to in the text — my copy does not even have a pocket to hold the fiche!

These blemishes notwithstanding, Perkins does provide an authoritative appraisal, at least to a reviewer only poorly versed in this matter. In Section II, she engages in a critical exploration of such wide-ranging national issues as labour market imbalances, supposed shortages of skilled labour, existing manpower policies, statistics, forecasting, planning, wage determination, immigration, barriers to occupational and locational mobility, manpower programmes, apprenticeships, innovations in trade-training and non-trade training. Of the several initial appraisals offered, the one which caught this reviewer's attention was the misallocation of resources in training and migration programmes to overcome "shortages" of skilled labour when "shortages" arise from high wastage because of poor wage relativities compared to many semi-skilled, clerical, sales and civil service occupations. Perkins emphasises the importance of effective manpower policies as a means of achieving economic recovery while dampening inflationary pressures with particular attention to "encouraging appropriate relative wage rate movements, the removal of institutional barriers like licensing, promoting a rapid training response (if there is a shortfall in the skill manpower stock), and implementing supporting government policies in other areas such as welfare housing provision and land release, and reduced tariff protection".

The Economics of Water Use in the Hunter Region is a short, well-documented, tightly-argued monograph, in which Dragun, Gleeson and Musgrave show an excellent command of both theoretical issues and

of the current political and administrative barriers to an effective regime of water management. The authors disagree with the accepted view that the chief management problem is one of too little water, but provide a well-argued case that too much water is allocated to irrigation, involving not only heavy subsidisation with little economic benefit, but also widespread degradation of both land and water, through salt, silt, pesticide and fertiliser effluents, reduced return flows and inadequate stream flushing.

The first three chapters provide a comprehensive documentation of existing circumstances, including data on current demand, on potential shortages, on augmentation proposals, on the economic importance of water to agriculture, coal mines, power stations and urban uses. Chapters 4 and 5 present well-argued discussion on efficient water pricing and markets in the Hunter Valley context, while Chapters 6 and 7 examine the questions of property rights, legislation and some operational difficulties in achieving economically "optimal" water transferability. Chapter 8 discusses externalities with particular attention to environmental quality, while the concluding chapters discuss alternative allocation policies.

The authors reject current proposals for capacity augmentation as "head in sand" solutions which will only encourage further inefficient agricultural use with increased economic, social and environmental costs. Recognising that the "existing legislative/administrative approach to water supply in New South Wales is a profound barrier to flexible and efficient water use", they examine various alternative arrangements. Full attention is given to the efficiency gains in replacing traditional water management institutions with market institutions in which water would be used where the value of the marginal product is highest, with some discussion on an appropriate provision for fully transferable water rights.

However, while noting the efficiency disparities of judicial and administrative approaches to water reallocation, the authors foresee political difficulties in the free market proposal. Instead, they propose to increase flexibility, based on private water districts related to particular water sources, with purchased transfer of water rights between all user classes within and, possibly, between districts. Associated with this would be buy back of irrigation water rights as a desirable alternative to increased investment in water augmentation.

In **Water and Coal**, Day gives ample attention to the host of water management issues posed by the continued expansion of coal mining, but her study is much wider than that. Indeed, she provides a near-encyclopaedic array of detail on every conceivable aspect of water management with chapters on: water in the valley; current and potential change in the availability and use of water; regional hydrogeomorphology; water storage and distribution; the hydrologic cycle and land use; water quality concerns; water policy and administration in New South Wales and in the valley; water planning, the resource and society; summary and recommendations.

Day shows a thorough grasp of all aspects of the subject and provides an authoritative summary of a wealth of reports and other publications. The reader is in danger of becoming submerged under a flood of information and will have difficulty in discerning the fundamental contrasts within the basin, particularly between the main catchment of the Hunter and its tributaries above Morpeth, and the Williams and Paterson River catchments. The deficiencies of the main catchment are described in considerable detail, yet the reader may fail to recognise just how severe they are, being more akin in terms of water yield, variability and quality, to adjacent inland drainage systems, notwithstanding Day's failure to emphasise this, nor her rather surprising statement that . . . "The Hunter Valley basin displays hydrological characteristics similar to those of many coastal valleys . . ." (p.4). This is certainly not true if the comparison is limited to New South Wales coastal catchments. Although water yield is described and tabulated at length, the sharp contrast between the two catchment components, mentioned above, is not highlighted, nor is the high degree of spatial variation revealed, as well could be done by the inclusion of a map of annual surface run-off.

In similar vein, the striking division of the overall catchment into two distinctive supply/management systems is mentioned only fleetingly, when it could well provide a useful structure for much of the analysis. This divorce is almost complete, with the metropolitan supply authority, the Hunter District Water Board, relying wholly on the Williams Catchment and coastal sandbeds and failing to accept possible entitlements to Hunter River flows because of water-quality problems.

The analysis of the main "inland" catchment does capture the full range of water supply deficiencies, conflicts in land and water use, institutional inadequacies, existing allocation policies and probable future directions. Thus this volume effectively complements the companion monograph on the economics of water use.

The series is concluded in the very substantial monograph, **Resource Development and Environmental Issues**. This volume stands separately as a self-contained review and synthesis of the others. Indeed, there are four chapters directly summarising these, with only a modicum of new material covering: coal (Parker), water (Day), air quality (Jakeman and Simpson) and manpower (Perkins).

This monograph also serves two other important purposes. Firstly, it introduces two entirely new components, with very effective appraisals of institutional performance (by J. Formby) and of infrastructure provision (by P. Parker). Secondly, the introductory chapter provides an effective overview of the context of the CRES project, as well as its major findings and recommendations.

Formby has the challenging task of appraising institutional performance in response to rapidly changing circumstances, with the spotlight focussing strongly on the state government and its instrumentalities. Formby discusses two relevant performance criteria. The first is jurisdictional correspondence, part of a more general

objective of public accountability, with emphasis upon the question of regional decision-making, involving those most affected by the outcomes. The second criterion relates to rational comprehensive forward planning *versus* an interventionist strategy in response to rapidly changing circumstances, generating unforeseen opportunities and problems.

Processes of public participation quickly break down under accelerated decision-making, and interventionist strategies give greater latitude to special interests to influence the outcome. The role of the state government, in seizing upon selected "windows" of opportunity to attract major new resource-based ventures in order to counter economic decline in the region's traditional industries, is perhaps the grandest example of the ever-increasing instances of state interventionism to pursue narrow developmental goals. As elsewhere, the environmental and social problems created by rapid, unplanned development then require a second phase of intervention to alleviate the deficiencies in financing and planning, particularly for infrastructure. These issues are well appraised by Formby, who presents a series of sensible proposals for rectification.

This chapter is neatly complemented by Parker's contribution on major policy issues related to infrastructure financing and control, given the complicating factor of risk associated with the life span and cyclical nature of resource projects. Parker effectively reviews the inadequacies of state infrastructure planning and the tardiness and ineffectiveness of programmes to alleviate heavy burdens on local government in areas of rapid resource development. The inadequacies of state support are contrasted with programmes adopted in Utah and British Columbia, where a large proportion of state royalties are diverted to a community impact fund to assist the most affected communities. New South Wales has been moving towards such a position, but only belatedly and imperfectly.

The introductory chapter to this volume provides a condensed review of major policy constraints and related policy points, including a summary of recommendations. These include ten recommendations on institutional performance and regional planning; thirteen on the coal industry; eight on infrastructure provision; eleven on water resource management; eighteen on air quality management; and eight on manpower requirements. These recommendations are logically related to the substantive analyses and assessment, and provide a very valuable agenda for regional planning and management for the Hunter Region. They are also indicative of the planning needs for other development regions in Australia.