THE AUSTRALIAN NATIONAL UNIVERSITY

SCHOOL OF RESOURCE MANAGEMENT AND ENVIRONMENTAL SCIENCES

INTEGRATED CATCHMENT ASSESSMENT AND MANAGEMENT (ICAM) CENTRE

This paper has been prepared in response to the House of Parliament's invitation to the Integrated Catchment Assessment and Management (ICAM) Centre, ANU, to make a submission in relation to the Committee's inquiry into catchment management. In preparing its submission ICAM has consulted widely within the University.

ICAM's submission is made from the perspective of a university-based natural resource R&D and education group whose mandate is to undertake project-based work and deliver output to land and water management agencies and other stakeholders.

This submission is intended to be brief and we accept that in order to be concise, there is a trade-off between generalities and documentation. We would be happy to comment in greater detail on specific references.

Summary:

- **catchment-scale understanding is a vitally important for preservation and management of Australia's water and land resources;**
- **despite spending 1.6% of GDP on the environment, large-scale problems are not being solved;**
- **greater emphasis must be placed on *integrated* catchment assessment and management.**
- **further development of structural mechanisms for linking coordination and cooperation between those involved in monitoring programs between Government levels.**

"The management of water resources is an integral part of environmental management and an essential requirement for supporting the economic, social and environmental objectives of our society" (ANZECC, 1992)

1. The development of catchment management

Government agencies as well as community groups have begun to recognise the complex interaction of physical environments and more importantly the impact of human activities upon diverse yet delicate physical systems.

Total Catchment Management is a philosophical approach that seeks to understand environments and manage the impacts of human activities within them. Consequently, within the last 15 years relevant State Government agencies have developed their own policies and legislation to focus the management of resources at the catchment scale. During this time, it has become clear that the involvement of stakeholders, including community groups is essential to the process.

Catchment management has evolved by fostering links between community, government and technical advisory groups. The main vehicle for this today is the

2. The value of the catchment approach to management

While there are several analytic frameworks for natural resources, catchment analysis is arguably the most appropriate approach to grouping the interplay between humanity, water and land surface resources.

This is because:
a) most ecological processes and environmental problems occur within catchments.
b) The two most prominent drivers of change, climate and human-induced land-use change have their clearest expression within catchments.
c) Water, a most valuable but critically limited renewable natural resource in Australia, obviously demands catchment-based understanding.
d) Hydrological connectivity (and on-site / off-site aspects of land degradation) is also most clearly understood within the context of the catchment.
e) Trade-offs between alternative water resource use must be considered within catchments

Catchment boundaries however do not commonly match government or administrative boundaries and there are often decisions and activities that are not restricted by catchment boundaries. However, management strategies and remedial works can be more effective if planned and implemented with 'whole-catchment' sensitivity.

Strategies should consider all the relationships between human involvement, land, water, vegetation and fauna. This interrelationship is critically important. Natural resource management (NRM) policies, infrastructure decisions and land management actions often ignore this linkage. Integrated natural resource planning and management is, we argue, necessary for efficient maintenance of our economic and bio-physical well-being. Planning which does not acknowledge the interdependency within complex systems will produce sub-optimal outcomes. Integrated NRM requires the input from bio-physical, economic and socio-cultural perspectives.

As well as input from these three perspectives, integrated NRM has two other pre-requisites:
- wide stakeholder involvement; and
- an appreciation of the time scales over which land management practices have an impact -and that these are often far longer than political demands.

Examples of trade-offs within catchments

Trade-offs involving water resources are best illustrated and management within the catchment context. COAG water reform and water trading is an excellent example, where the competing needs of environmental flows and irrigated agricultural development must be considered within the catchment context.

Equally, corporatisation of the Snowy Hydro, which generated the Snowy Water Inquiry (SWI) last year, was an excellent case study of trade-offs. ICAM was engaged by the Snowy water Inquiry and made contributions in a number of areas. The SWI had to consider the ecological impacts of the Snowy Scheme on the diverted rivers, and the impacts of various flows back into those rivers as a prelude to the allocation of guaranteed water resources to the new corporatised body. The SWI had to give fully costed options and had to consider the social, economic and ecological impacts of various options. The social demands of residents in the Snowy River corridor and the ecological remediation of the Snowy below Jindabine were offset against the demands of irrigated agriculture in the west, which had grown up on the allocation of diverted water, and the resources' use for hydro power generation in the Snowy Hydro.

3. Best management practices (BMPs)

BMPs are more commonly written about than implemented. The scale at which BMPs are discussed deserves attention and highlights the differences of approach between agencies. For example, BMPs for agricultural systems will often model on-farm activity, irrespective of off-site impacts. Dryland salinity control, by comparison, may offer alternatives between remedial action at either the recharge or discharge sites – which may be well separated and involve actions which do not conform to best-practice on selected farms

Delivery of information on BMPs is often fragmented and dependent on centrally programmed activities rather than local needs within catchments.

There is still much research needed to understand the processes that determine catchment health, particularly the relationships between river condition and land use. Without them, the robustness of BMPs will be questioned.

4. Role of different levels of government

4.1 The recent variation to the National Environment Laws places increased emphasis on the role of the States and less, with the exception of 'trigger' events, on the Commonwealth. However, many natural resource management problems (eg. dryland salinity) are national in scope and require coordinated attention. The role of the R&D Corporations is thus very important in maintaining a national perspective.

The role of Environment Australia in overseeing national environmental reporting is also important.

The effective exclusion of research from locally-focussed NHT grants has been a disaster. Many opportunities for building university-to-local authority projects, with integration of enhanced understanding of the cause of land degradation problems, has been sacrificed on the altar of short-term political expediency.

4.2 At the State level, where integrated catchment management should be practiced, the picture is not positive. There are over 30 different natural resource and environmental management plans currently being used in NSW alone. Agencies in NSW often have quite different approaches to natural resource management.

There is also functional dislocation, resulting from implementation of policies by state governments. For example, the Total Catchment Management (TCM) policy adopted by NSW in 1989 gave a sound basis for ".. the coordinated and sustainable use of land, water, vegetation and other natural resources on a catchment basis so as to balance resource utilisation and conservation …" However, River Management Committees, which have responsibility for advising on allocation of water (environmental flow and river flow objectives), are not yet completely integrated into the TCM program.

This pattern is probably repeated in other states.

The capacity of state agencies to perform their coordination and implementation roles has been hampered by:

- resource reductions – DLWC is taking a reported 5% cut in funding this year (and a 30% cut to its research budget);
- de-skilling of departments by staff attrition and position juniorisation;
- the limited opportunity for staff to increase their skill-base and contribute to leading edge R&D.

4.3 Despite this somewhat bleak picture, there are practical mechanisms which can be encouraged to help address on-ground problems.

ICAM has formed a long-term relationship with the Murrumbidgee Catchment Management Committee, based on the objectives identified in the CMC's Catchment Management Plan.

The approach here has been to treat the CMC as a client with identified needs, rather than as the administrator of a patch of land researchers would like to work on. ICAM will provide research services, help develop a Regional Information System (RIS) and undertake research on three priority issues identified by them – dryland salinity, water management and sustainable land management.

We believe that development of catchment-focussed Regional Information Systems will offer a practical method of delivering information cost-effectively to a wide range of stakeholders.

5 & 6. Planning, Resourcing and Mechanisms for Monitoring

State of the Environment (SOE) reporting is the most recent and widely used mechanism for monitoring the physical environment. The mechanism has the aim of ensuring a consistent approach to environmental monitoring across all levels of Government and agency groups. The aim of SOE reporting has been to;
1). Create a comprehensive and systematic approach to monitoring, and to;
2). Overcome the 'piecemeal' approach that has also resulted in monitoring programs addressing symptoms rather then underlying causes of environmental degradation.

To date, SOE reporting has attempted to overcome these two main problems by the following mechanisms;

1. Consistency of reporting requirements by the integration of OECD Guidelines, National Reporting Guidelines, State reporting Guidelines and finally Local Government Guidelines.

2. The development within these guidelines of 'Core' and 'Supplementary' indicators that are required to be monitored as a means of ensuring symptoms rather than causes are addressed.

The desired outcome therefore, is a system of monitoring that is able to aggregate data at various scales that are consistent and relevant to addressing priority issues.

However, problems at both State and Local level are placing considerable strain on achieving these outcomes. Essentially, the aims of monitoring programs such as SOE reporting have not been addressed due to the following problems;

1) *Coordination/ Cooperation*: Links between those working on the report and catchment monitoring programs are often poor. The result is that information that has been collected by those in the field and other groups is not assured of inclusion in indicator information in the report. The problem of loss of available information results in significant data gaps within SOE reports at the regional level.

Consequently, consistency between regional reporting areas is not assured in the monitoring process or reports. As a result, regional comparisons are not able to be made, ensuring that SOE reporting is fragmented at this scale.

For example, the Murrumbidgee CMC has identified the difficulty associated with accessing quality data (and distributing it to stakeholders, see point 4). A Regional Information System would be one mechanism of organising and accessing data to overcome this problem.

2).*Evaluation of Impacts/ Progress Monitoring*: Given that various catchment reports and programs are incorporated into the SOE, management programs are left to the "Response" section of the report under the Pressure-State-Response model of reporting. There is no evaluation loop between the problem and programs being carried out to address them. SOE provides no clear guidelines as to how programs identified in the report can be monitored, improved or if they are making an impact upon the problem.

3). *Planning and Resourcing*: At the Local Government scale in particular, problem 2 is enforced by a lack of structural accountability within the organisation carrying out the

monitoring and reporting program(s). Programs that are developed for inclusion in future SOE's have no mechanism of being linked to the organisations strategic goals. The result is that new environmental programs are not allocated funds or at most implementation is *ad hoc* or politically motivated (enforcing a piecemeal approach to program development and implementation).

4).*Cooperation between stakeholders*: Finally, SOE's are a mechanism for reporting on programs for the benefit of groups such as CMC's who require information on what is currently occurring in the catchment, both process- and program-wise. Presently, there is no formal mechanism for distributing program information for evaluation by these groups. A formal mechanism of cooperation between CMC's, RMC's and other TCM programs would strengthen the monitoring and reporting process.

5) Coordination between Monitoring Programs: A more recent monitoring mechanism has been the introduction of State of the Catchment programs (SOC's). Although quite different in nature to the SOE's, it would be advantageous to mesh the SOC monitoring and reporting cycle with that of Local Government, SOE's and monitoring programs of groups such as CMC's. This would consist of a 6 year cycle rather than the proposed 5 year cycle.
