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Preparation of a research plan for Natural Resource Management in northern Australia

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Abstract

Revision of the Australian government's environmental research strategy provided an opportunity to define research priorities for Natural Resource Management (NRM) in northern Australia. To this end, 11 NRM groups and seven Regional Development Australia (RDA) boards collaborated on a plan identifying research priorities and preferred delivery model. They participated at all stages of plan drafting, revision and finalisation through conversations guided by a semi-structured response framework; a workshop; and circulation of plan drafts.

Five research themes were identified addressing 39 priority research needs through 48 potential thematic projects:

(1) Governance, policy and influence
(2) Sustainable livelihood and agricultural options
(3) Water resource planning and water quality improvement
(4) Landscape planning for land use and management

(5) Biodiversity and wetlands management

NRM groups and RDAs are core partners in regional environmental research programs from strategic thinking through to bid development and project delivery. As key stakeholders they can also enhance research performance through:

(1) Direct investment in research and brokering partnerships with other investors;
(2) Insight about knowledge needs and program operation;
(3) Extensive networks to ensure two-way communication between researchers and stakeholders and maximise research uptake; and
(4) Access to research locations, partners and case studies.

Strategically-managed processes and partnership arrangements are required to formalise these roles, responsibilities and expectations. In particular, adequate time and resources should be allocated to enable active engagement and participation and involvement in monitoring/evaluation.

Introduction

NRM groups facilitate sustainable environmental management. They work with managers, industry bodies, community groups, government agencies and researchers to broker relationships concerning natural resource matters and facilitate information exchange. As custodians of NRM plans, they provide regional frameworks for sustainable management of biodiversity, land, sea, water and atmospheric resources. RDAs drive and support sustainable development of regional economies across agriculture, tourism, mining and fisheries, underpinned by robust education and health services sectors and fit-for-purpose infrastructure.

NRM groups and RDAs need to draw on the best available information about environmental, economic, cultural and social values and vulnerabilities and management options to target effort and investment and provide NRM advice. They are in a good position to identify where research will have greatest impact. Some northern NRM groups commission their own research, considering current research programs are not meeting these needs.

Australian Government's revision of national environment research priorities provided an opportunity to identify research needed to improve environmental conditions and livelihoods across northern Australia. NRM groups and RDAs were therefore approached to collaborate on the development of a research plan identifying research priorities and associated delivery mechanisms.

Methodology

Eleven northern NRM groups and seven RDAs were approached to collaborate on the plan. Initial input was through phone, email and/or face-to-face meetings guided by a structured response framework covering:

(1) Environmental research priorities for northern Australia
    a. Organisational research priorities
    b. Priority investment areas
    c. Priority research topics
    d. Factors to be considered in research prioritisation
(2) Governance framework
    a. Engagement and communication principles and practices
    b. Role of responding organisation
    c. Integration of research findings into your business
    d. Identification of stakeholders

An interim report was circulated to contributors for feedback and a workshop held where the plan structure was determined. The plan was finalised after further feedback from contributors.

Results and Discussion

Priorities

Five research themes were identified covering 39 priority research needs and 48 projects (Crowley at el. 2014).

Theme 1: Governance, policy & influence

Monitoring and reporting is pivotal to continuous improvement and policy development. Research required:

(1) Develop governance benchmarks and social and environmental indicators to track program progress and ensure national environmental policies and programs reflect northern conditions and needs.
(2) Identify governance models effective at engendering community ownership of sustainable practices; which extension activities provide greatest practice improvement; and how to combine these to enhance quadruple-bottom-line outcomes.

Theme 2: Sustainable livelihood and agriculture options

New approaches to economic development are needed to provide ongoing employment while protecting ecological values. Research is required to determine:

(1) Regionally appropriate agricultural and alternative livelihood options, including offset schemes.
(2) Feasibility and long-term employment and economic benefits of options through pilot programs.
(3) Best combinations of options across the landscape; including the role of low-footprint, cost-effective infrastructure.

Synthesis and improved access to information on sustainable livelihood options are also required.

Theme 3: Water resource planning and water quality improvement

Expansion of agriculture and mining is placing increasing pressure on water resources and associated ecosystems. Efforts to improve water quality in terrestrial and marine environments need to be targeted to where they will have most impact. Research is required to determine:

(1) Water availability; rates of groundwater recharge; and impact of storage and extraction on cultural and environmental values and dependent industries and communities.
(2) Water storage, delivery and allocation to suit tropical conditions.
(3) Current and future saltwater intrusion; and implications for coastal development.
(4) How and where the most damaging pollutants are generated and regionally appropriate options for improving water quality.

Theme 4: Landscape-scale planning for land use and management

Informed decision-making with an understanding of local and regional impacts of development, including trade-offs and lost opportunities, is required to maintain Northern Australia's ecological and cultural assets and enhance its long-term economic viability and community resilience. Research requirements:

(1) Develop and populate planning decision-support tools with improved understanding of:
    a. Environmental, cultural and economic assets;
    b. Landscape function and processes, including ecosystem services and connectivity;
    c. Pressures, drivers and long-term economic outlooks and their interaction; and
    d. Benefits, impacts and trade-offs of current and potential land uses and associated infrastructure

Theme 5: Biodiversity and wetlands management

Protection of northern biodiversity requires maintaining the condition of extensive landscapes and targeted management of high-value assets, particularly wetlands. Research is required to identify:

(1) Location of high-value species and habitats; their values and threats; and appropriate management regimes.
(2) How to plan for land use while retaining representative native vegetation and essential habitat; and to achieve integrated pest, fire and grazing management.
(3) Ecosystem services provided by wetlands, and appropriate fee-for-service arrangement for their management.

Governance and Involvement

NRM groups and RDAs are core partners in environmental research programs from bid development to project delivery. They can often provide direct investment or broker partnerships with other investors. They have expertise regarding research impact and adoption; environmental management and planning; governance arrangements and research adoption. They can provide two-way communication between researchers and stakeholders; facilitate access to research locations, partners and case studies; and ensure research uptake.

Robust governance arrangements are required to ensure research programs meet NRM needs. Involvement of NRM and RDAs should be formalised through strategically-managed processes and partnership agreements recognising roles, responsibilities and expectations. This may include involvement in decision-making and research assessment; input into contractual arrangements; and active participation in research projects. A co-research approach requires additional time and resources. However, researchers adopting this approach will benefit from strong relationships and networks and make significant contributions to northern environmental management.

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