Submission to the State Sustainability Strategy

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Perspective: Research and Development Organisation

The Ord-Bonaparte Program (OBP) is a major natural resource management R&D program seeking to underpin ecologically sustainable development in the East Kimberley region, and provide learnings transferable to other regions in northern Australia and elsewhere. The key features of the program are its integrated nature – encompassing ecological, economic, social and cultural issues across a range of land uses – and its ambitious scope, extending from the top of the Ord catchment out to sea.

The Program is committed to effective community participation and capacity building, and research projects have been developed through a collaborative process with the regional community.

WHAT RESEARCH AND DEVELOPMENT IS NEEDED TO PROGRESS TO SUSTAINABILITY?

In the *Sustainable Development of Tropical Northern Australia: R&D for Management of Land, Water and Marine Resources*, Johnson *et al* (1999) identified a number of challenges to the sustainable planning and management of natural resources in northern Australia from existing literature and discussions with a broad range of stakeholders. These were:

Planning Systems

- *The constraints imposed on planning and management by the paucity of social, economic, ecological, ethnobotannical and ethnographic data.*
- *The need for natural resource management (NRM) activities to be effectively underpinned by high quality technical support.*
- *Increasing development pressure occurring within a context of poor data availability (especially in the marine environment), particularly a lack of data at a relevant scale.*
- *Limited process understanding in terrestrial, aquatic and marine systems (most process understanding exists at plot, point or plant community scale).*
- *The need for institutional arrangements to facilitate broad stakeholder representation/participation in regional decision-making.*
- *Limits on available human and financial resources are a significant constraint.*
- *In order to establish the necessary preconditions for R&D to support effective planning and management, there is an urgent need for capacity development in many stakeholder groups.*

Integrated Resource Management

- *The need for NRM R&D to focus at multiple spatial and temporal scales.*
- *The importance of addressing human and cultural context and diversity in values.*
- *The need for improved coordination of NRM R&D functions within and between agencies.*
- *The need to enhance transfer of information between researchers, managers and key stakeholders across catchment, estuary and marine systems.*
- *The need for integrated decision-making across terrestrial and marine environments.*
- *The need for active and effective community involvement in planning and management.*
- *The critical importance of negotiation and conflict resolution strategies.*

Indigenous Resource Management

- *There is a lack of effective recognition of indigenous aspirations and rights in NRM, particularly the lack of incorporation of native title into broad land use objectives.*
- *Indigenous communities/agencies are poorly resourced for participation in NRM processes.*
- *Integration of indigenous knowledge with agency-based NRM practice.*

- *Parity between indigenous tenure systems and agency management boundaries, or recognition of the distinction between them at a management and jurisdictional level.*
- *The need to address social/community issues within a NRM context.*
- *Development of multiple use strategies on indigenous controlled land so as to achieve viability in landowners' terms.*
- *Capacity building to assist in planning and management by traditional owners.* (Johnson *et al* 1999 after CSIRO 1999, p 4).

Priorities for R&D in the Ord-Bonaparte region

CSIRO (1999) note that…*the (Ord-Bonaparte) region provides a range of ecosystems and land use-marine interactions that are at present poorly understood in Australia" and "is therefore an excellent region to model for evaluation of impacts of future similar developments elsewhere in northern Australia, as well as gaining biophysical, socioeconomic and cultural knowledge and process understanding which will be widely applicable elsewhere. The region is under considerable development pressure from an expansion of irrigated agriculture, increasing tourism, changes in rangeland management due to economic and cultural factors, potential to further use marine resources, and the demography of a young and growing indigenous population. There is an opportunity, through carefully targeted R&D, to assist the community to plan and achieve sustainable futures and to avoid many of the errors made in developing southern Australia* (CSIRO 1999, p 1).

Priorities for R&D to support sustainable development in the Ord-Bonaparte region were identified by Johnson *et al* (1999) as:

- *Improved baseline data for hydrology, aquatic biology/ecology, landscape ecology, fisheries biology, ethnobotany and ethnography at relevant scales;*
- *Process understanding at a relevant scale within and between terrestrial, aquatic and marine ecosystems;*
- *Data/understanding about the key social, cultural and political processes driving natural resource use in the region;*
- *Data/understanding about the key economic processes driving natural resource use in the region;*
- *Mechanisms and tools to integrate and make accessible data, knowledge and understanding to support planning and management activities.*
- *Best practice for participatory planning in rural regions to ensure more effective planning and management in the future, including innovative methods and approaches for developing stakeholder capacity.*
- *Reviewing and evaluating alternative institutional mechanisms.*
- *Capacity – lack of human and financial capacity is a fundamental constraint to R&D delivery* (Johnson *et al* 1999 after CSIRO 1999, p 11).

The objectives identified for R&D in the region were:

Capacity

- Develop improved stakeholder analysis methodologies.
- Evaluate appropriate capacity development models.
- Develop an improved understanding of how information technology in enhancing the capacity of clients and stakeholders to adopt R&D products.
- Provide an improved basis for facilitating stakeholder access to data, information and knowledge.
- Integrate systems methodologies into participatory approaches for natural resource planning and management.
- Develop methods and tools for improving the effectiveness of education and extension for natural resource planning and management.
- Evaluate integrated approaches to natural resource planning and management as a basis for inter-stakeholder negotiations in the Ord-Bonaparte region.
- Ethical aspects of participative approaches, particularly within a community participation context.

Institutions

- Develop an improved understanding of the institutional and associated arrangements that directly affect natural resource management in the region.
- Develop an improved understanding of institutional processes and their influence/importance on decision-making within a regional context.
- Assess the effectiveness of current institutional arrangements and processes from a social, political and technical perspective.
- Develop and evaluate alternative institutional arrangements and processes that will benefit a broad range of stakeholders.
- Develop an improved understanding of the organisational context of planning in the Kimberley and WA in general.

Technical

- Characterise catchments in the Joseph Bonaparte Gulf (NW WA/SW NT), in terms of their biophysical, social, cultural and economic resources
- Characterise the estuaries, coasts and shallow continental shelf in the Joseph Bonaparte Gulf in terms of biophysical, social and economic resources
- Develop a fundamental knowledge of processes and interactions
- between patterns and process of resource use activities at paddock,
- catchment and landscape scales in the Ord River catchment regional scale
- Quantify the impacts of land management practices on the ground and surface water resources of the Ord River catchment
- Investigate the ecological impacts of land management practices in the Ord River catchment on aquatic resources
- Investigate the impacts of land management practices on coastal and marine resources from the spatial and temporal distribution of water, sediment and nutrient export from the Ord River catchment
- Quantify the impact of climate variability on the spatial and temporal distribution of water, sediment and nutrient from the Ord catchment and on future resource use
- Develop models of climate variability in the Kimberley in order to assess the potential economic, ecological, social and cultural impacts of change on the Ord catchment and associated coastal environments of the Joseph Bonaparte Gulf
- Develop an improved understanding of social, cultural and economic processes operating in the Kimberley
- Develop methods for improved integration of cultural heritage considerations in regional planning and management
- Develop methods for improved integration of social considerations within natural resource planning and management in the Kimberley
- Evaluate the aquaculture potential of the Kimberley region
- Quantify impacts of tourism development in the north Kimberley and Ord River catchment

- Develop indicators of regional and catchment sustainability in the OrdÐBonaparte region
- Methods and strategies for integrating economic, ecological, cultural and social values into agricultural and pastoral production systems in the Kimberley Identify options for satisfying future transport and infrastructure requirements for the Kimberley
- Define and develop appropriate system synthesis and integration tools for planning and management of resource use in the Ord-Bonaparte region
- Assess trade-offs between multiple objectives and multiple stakeholders for resource use in the Ord- Bonaparte region
- Develop improved methods for natural resource planning and management in the Kimberley

Several options for integrated R&D approaches were considered:

1. *Improved natural resource planning and management capacity in the Kimberley region* - assisting stakeholders in the Kimberley region to improve their capacity to participate in natural resource planning and management.
2. *Improved institutional arrangements for natural resource management and planning in the Kimberley region* -assessing the current institutional arrangements influencing natural resource planning and management in the Kimberley, identifying their strengths and weaknesses, and developing and evaluating alternatives where necessary.
3. *Assessment of impacts of natural resource use on ground and surface waters of the Ord River catchment* - the impacts of resource use on sediment generation, nutrient movement, water flow and other contaminant flux of ground and surface waters at scales ranging from farm to catchment.
4. *Assessment of impacts of natural resource use in the Ord River catchment on the marine resources of the Joseph Bonaparte Gulf* - the impacts of resource use on the adjacent marine environment in terms of sediment, nutrient, water and other contaminant fluxes from ground and surface waters at catchment.
5. *Sustainable development of the Kimberley: R&D for integrated planning and management of land, water and marine resources in the Ord-Bonaparte region* - a major R&D effort aimed at integrating current and new knowledge to support the development and implementation of negotiated approaches to natural resource planning and management (Johnston *et al*, 1999)

The key recommendations of Johnston *et al* (1999) were that:

- *The focus of future R&D should aim to address integrated natural resource planning and management issues at the regional scale (ie. whole of catchment, marine bioregion).*
- *That significant new R&D investment relating to natural resource management in northern Australia be focused on the Kimberley region, with special emphasis on the Ord-Bonaparte area.*
- *A participatory planning systems approach based on sustainability, equity, accountability and integration represents the most appropriate and viable conceptual approach for R&D in the Kimberley region.*
- *Future R&D relating to natural resource management in the Kimberley should focus on the development and implementation of an integrated package of research as specifie d in research proposal 5 (above).*

A five-year R&D Plan for the OBP to address these priorities was prepared in late 1999 with the participation of a wide range of agencies and stakeholders. The R&D Plan set out strategies to address the issues identified in the Scoping Study and outlined the activities and associated resources required within five subprograms: *Regional Resource Futures*; *Rangeland Systems*; *Water Resource Planning and Management*; *Coastal, Estuarine and Marine Resources* and *Aboriginal Management and Planning for Country*.

A Collaborative Research Agreement developed in 2000 formally established the OBP, and outlines the structure and objectives of the Program and the resources committed by funding parties over the five years to 2005 (OBP 2000). Land & Water Australia, as Program Agent, administers the program on behalf of the agreement parties.

Scoping projects to refine research proposals were conducted in 2001. Research in 2001/2003 focuses on the collection of fundamental data and information for sustainable NRM and addressing critical strategic issues in the region within the levels of funding currently available. Current Projects are:

Characterisation of Rangeland Resources

- Biodiversity mapping
- Land unit mapping
- Remotely sensed rangeland assessment and monitoring.

Best Utilisation of Water Resources for the Ord River Irrigation Area (ORIA)

- Groundwater and surface water monitoring for the ORIA.
- Groundwater and surface water interaction models
- Scenario analysis for the ORIA and downstream impacts.
- Managing surface water quality at the farm level.

The response of the Lower Ord River and Estuary to Management of Catchment Flows and Sediment and Nutrient Loads

- A field program, based around monthly monitoring, with limited additional process measurements, to provide a picture of nutrient cycling and water quality in the river channel, estuary, and underlying sediments.
- Integrated simulation models of hydrodynamics, water quality, nutrient cycling and primary production, and ecological response, which will be implemented and calibrated to provide a predictive capability for management scenarios.

Plants and Animals of Kija, Jaru country: Aboriginal knowledge conservation and ethnobiological research in the upper Ord catchment

- Aboriginal people recording their ethnoecological and ethnoeconomic knowledge, to assist in its conservation and transmission to future generations, and to contribute to better natural resource management in the region (and northern Australia).

Data access and information, GIS and cultural mapping with Kija and Jaru people in the upper Ord catchment

- Developing the capacity of Aboriginal people to access information, to record, store, analyse and distribute information from Subprogram 5 research, and to utilise GIS as a management tool for Aboriginal lands.

Capacity Building and Two Way Learning for Miriuwung-Gajerrong and Balangarra people in the lower Ord catchment

- Working with Aboriginal people in the region to build capacity for community based planning, to participate in resource management processes, and to direct, participate in and use OBP research.

Development of an integration framework for the OBP (Phase 1)

- Development of an integrated database of key environmental, economic and administrative data
- Transfer of skills in data loading techniques and running planning tools.
- Design of Pilot integration projects that address key regional NRM issues identified through stakeholder workshops, and that are suitable for progressing through Phase II of the project.

Extending the scope of OBP research to fully encompass the comprehensive, integrated regional approach anticipated in the R&D Plan will require the commitment of significant additional resources to the Program by government and industry.

KEY QUESTIONS

Is sustainability a worthwhile pursuit?

Sustainability is not only a worthwhile pursuit, but is essential to:

- enhance individual and community welfare by following a path of economic development that safeguards the welfare of future generations;
- provide equity within and between generations; and
- protect biological diversity and maintain essential ecological processes and life support systems.

Our economic and social development and well-being are dependent on the health of the earth's ecosystems and ecological processes.

What benefits could flow if sustainability was taken more seriously?

If sustainability was taken more seriously by government and policy makers, a future where positive social and economic benefits are achieved and ecological systems and processes are maintained (or restored) becomes more possible.

From an R&D perspective, taking sustainability seriously means that adequate levels of resourcing would be directed to research to support ecologically sustainable development, including obtaining fundamental baseline data, improving institutional arrangement to better promote and support sustainability, and the implementation of long-term environmental monitoring programs.

A sound information base deriving from well directed and adequately funded research would assist government, industry and the community in developing legislation, policy and practice to implement the changes necessary for a sustainable future.

Taking sustainability seriously means: taking a long term approach to development issues; appropriately valuing natural resources, including biodiversity and ecosystem services; taking a precautionary approach in matters of environmental impact when a lack of information generates uncertainty; reviewing institutional arrangements to ensure that they support sustainability; and ensuring participation in informed debate by all stakeholders with equitable access to sound information.

In your experience, what opportunities exist to pursue sustainability?

Particularly significant opportunities to pursue sustainability exist in those regions of Australia, such as the tropical north, which are rich in natural resources, but still provide the opportunity to take a proactive approach to sustainable development, rather than the reactive and remedial approach required in many other parts of Australia.

The challenge is to retain the landscape, cultural and environmental values by building the triple bottom line into all aspects of planning and decision making.

Truly collaborative partnerships between governments, industry, researchers and the community provide the best opportunities to pursue sustainability objectives in such regions.

What is the role of government, business and the community in facilitating change to be more sustainable?

The roe of government is to lead the community in ensuring that ecological sustainability is the principle underpinning development. Government can facilitate change to a society founded on principles of sustainability through the development and implementation of necessary law, policy and institutional change.

From and R&D perspective, the role of government is to support the research necessary to make informed decisions about development and consider alternative futures, and to ensure equity and transparency in decision-making processes. Government also has a role in providing incentives to community and industry for becoming more sustainable and disincentives to initiating and/or continuing unsustainable activities.

Industry has a critical role in facilitating change to be more sustainable through taking responsibility for ensuring that new development is sustainable, and phasing out unsustainable practices. Implementation of self-regulation through sound environmental management systems is an example of a significant contribution that industry can make to sustainability goals.

The community can facilitate change by being local advocates for sustainability, actively involved in decision-making processes. If the community has a commitment to sustainability, achieved through being well informed, then making societal changes to become more sustainable will be more readily implemented. "Thinking globally and acting locally" is a valuable approach for communities in dealing with sustainability issues.

What best-practice examples exist, if any, to demonstrate how sustainability is being progressed?

The Ord-Bonaparte Program is attempting to put into place a best-practice approach to progressing sustainability in the Ord-Bonaparte (East Kimberley) region. The aims of the OBP are underpinned by the environmental, economic, social and cultural principles of Ecologically Sustainable Development (as defined by the National Strategy for ESD, 1992). The OBP aims to acquire data, knowledge and information and to develop tools, methods, processes and strategies to guide the ecologically sustainable development of natural resources in the East Kimberley region.

The OBP research approach involves:

- Collaborative partnerships among government agencies, research organisations, industry, non-government organisations, indigenous groups and community groups.
- Participatory research approaches to: stimulate the sharing of knowledge; provide a learning experience; provide a sense of ownership for users/clients; improve the usefulness of research products; foster improved client/stakeholder relations; and foster the development of change skills for both R&D providers and clients/stakeholders.
- Capacity building to enable stakeholders to effectively participate in, and achieve, desired outcomes from NRM processes. R&D has a role in capacity building through the development of tools, methods, the collection and collation of data, as well as improving the general understanding of NRM issues and approaches by stakeholders.
- Facilitating equitable access to information through concerted communication and adoption efforts, including the anticipated development of a Regional Information System.

In addition to the best-practice approach being taken to the implementation of the R&D program, as outlined above, OBP research outcomes will contribute directly to best practice NRM in the region and elsewhere. Short to medium term outcomes of OBP research in Water Resources Planning and Management, for example, include progress towards the implementation of best practice management for water resources in the Ord Irrigation Area, particularly improved and profitable irrigation management practices that reduce environmental impacts. Progress toward best practice in other areas of NRM will be similarly supported by research in other OBP subprograms.

References

CSIRO. 1999. Ord Bonaparte Program R&D Plan. CSIRO, Townsville.

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