



# Implementation Plan for Climate Change Adaptation Research: Social Economic and Institutional Dimensions of Climate Change

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1.	Purpose of Implementation Plan .....	1
2.	Preparation of the National Climate Change Adaptation Research Plan for the Social, Economic and Institutional Dimensions .....	2
3.	Developing the Implementation Plan .....	3
4.	Potential Sources of Research Funding.....	3
5.	Potential Sources of Research Delivery.....	8
6.	Strategy for National Coordination .....	12
6.1	Immediate investment .....	12
6.2	Building the Program .....	13
7.	Impediments and Risks .....	14
8.	Monitoring.....	14
10.	Communication and Engagement.....	14
Appendix 1    Priority Research Questions in the SEID NARP.....		16

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## 1. Purpose of Implementation Plan

Social, economic and institutional considerations are central to adaptation to climate change in Australia for every sector, location and social group. Adaptation responses need to be informed by knowledge of possible impacts of climate change on things that are valued by individuals and social groups, such as employment, good health, and the natural environment. Information is also required about the potential effectiveness and cost of adaptation initiatives, possible unplanned effects of the initiatives on other people, places, industries, sectors and future generations, and implementation barriers and enablers.

At present there is little knowledge about these and other human dimensions of climate change adaptation.

The Australian Government has identified the need for research that can develop a theoretical and empirical basis to inform decision-making about adaptation by households, businesses, community groups, and governments.

The National Climate Change Adaptation Research Facility (NCCARF) has developed the *National Climate Change Adaptation Research Plan: Social, Economic and Institutional Dimensions* (the SEID NARP). This Plan identifies high priority research topics that will guide research investment and activity for the coming five to seven year period and support effective adaptation by all parts of the Australian community to climate change impacts.

The purpose of this Implementation Plan is to define the most effective way to build (and in some case initiate) national investments to address the research priorities in the SEID NARP. The focus is on:

- Delivering research to address the objectives of the SEID NARP;
- Facilitating collaborative arrangements;
- Maximising resources for priority research; and
- Optimising the timing of research investments.

The Implementation Plan outlines opportunities to implement research at the current point in time. NCCARF will update the Implementation Plan periodically to ensure that new opportunities are continually developed and harnessed.

## **2. Preparation of the National Climate Change Adaptation Research Plan for the Social, Economic and Institutional Dimensions**

The SEID NARP was developed by a writing team expert in climate change and social, economic and institutional research. The writing team built on existing research and used stakeholder comments gained during a workshop held in Canberra in December 2008 to understand key information requirements and identify gaps in the information available to key end users.

A draft version of the SEID NARP was subject to widespread national consultation between 26<sup>th</sup> November 2009 and 20<sup>th</sup> January 2010. This consultation was announced on the NCCARF and the Department of Climate Change and Energy Efficiency (DCCEE) websites and in a national newspaper, and over 600 emails and letters were sent out informing interested parties of the consultation and inviting responses. A public information session was held in Canberra in December 2009. The draft SEID NARP also underwent independent international review to ensure its alignment with latest advances and thinking world-wide.

Fifty-six formal responses were received from the full range of interest groups – government departments, research organisations, peak industry groups, the business sector, community groups and individuals. All responses from the public consultation were considered by the writing team in preparing the final version of the SEID NARP. The high priority research questions which resulted from this process are provided in Appendix 1.

### **3. Developing the Implementation Plan**

This Implementation Plan has been developed using information gained during consultation on the draft SEID NARP (see section 2), a survey of potential research investors and providers and further discussions with key stakeholders including prospective partners in research investment and provision regarding:

- How their research objectives and priorities align with those of the SEID NARP;
- The nature of their current or future research funding and activity programs;
- Opportunities for collaborating in funding or undertaking research; and
- Possible mechanisms for co-funding and / or research collaboration.

### **4. Potential Sources of Research Funding**

This section outlines potential sources of research funding to address the social, economic and institutional dimensions of climate change adaptation, including current investment activities and opportunities for collaboration.

While there is extensive social, economic and institutional research in Australia, little has been focussed on climate change adaptation. New research and funding initiatives will be required to develop national-scale research and research capacity in this area.

In time, climate change adaptation research priorities will be integrated with social, economic and institutional research. Social, economic and institutional factors will become mainstreamed into all aspects of thematic and issue-focussed climate change adaptation research. The goal and role of this Implementation Plan is to initiate research addressing the key national priorities identified in the SEID NARP, and to build the research capacity needed for future research requirements in this area.

#### **4.1 Australian Government**

##### **4.1.1 Department of Climate Change and Energy Efficiency – Adaptation Research Grants Program (ARGP)**

The Department of Climate Change and Energy Efficiency (DCCEE) is able to allocate up to \$5 million as seed-funding for research to address the social, economic and institutional of climate change adaptation through the ARGP. A requirement of the ARGP is that this funding is used to:

- Fund high-quality end-use focussed research into climate change adaptation;
- Support collaborative, cross disciplinary, cross institutional research where appropriate;
- Build and harness the capacity of the research and end user communities;
- Promote investment in climate change adaptation research including through leveraging funds from other research funding vehicles; and

- Develop information and knowledge products which specifically meet the needs of policy and decision makers and other end users.

DCCEE seeks to initiate and leverage additional funds to support a nationally coordinated effort through targeted application of the funds available in the ARGP. This would aim to bring together resources available from the Australian Government, state, territory and local governments, research organisations, community organisations, and industry to develop information and knowledge products that meet the needs of policy and decision makers and other end users.

The ARGP funding is available from 2010/11, and all projects funded through this program will need to be completed by June 2012<sup>1</sup>.

There are a number of options for maximising the effectiveness of DCCEE funding. The DCCEE, in association with NCCARF, may initiate one or more open research calls, may commission research projects, or may form strategic alliances with one or more funding partners.

From the nine high priority research topics identified by the SEID NARP, the DCCEE has identified three that are especially important to the developing climate change adaptation agenda of the Australian Government. These priorities for immediate investment are:

1. Understanding the equity dimensions of current and future vulnerability and adaptation (NARP Priority Topic 5).
2. Understanding how to assess and value adaptations to climate change, including value of opportunity costs, avoided damages, residual impacts and benefits gained (NARP Priority Topic 9). *Research on this topic should take account of the Australian Government's policy on climate change adaptation: Australian Government 2010, Adapting to Climate Change in Australia. An Australian Government Position Paper. Department of Climate Change and Energy Efficiency, Canberra.*
3. Understanding how laws and legal institutions, including regulatory instruments, support or impede adaptation planning and practice, and identifying key reforms that would be required to improve national capacity to adapt (NARP Priority Topic 12, but with modified wording). ~~*Research on this topic should take account of other research activities in this area.*~~

The DCCEE is particularly keen to see the development of strong national research consortia to address these priorities.

The ARGP funding is available from 2010/11. All projects funded through the ARGP will need to be completed by June 2012, but this may be affected by the outcomes of the NCCARF Operational Review (see Footnote 1).

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<sup>1</sup> The end date for projects may be extended to June 2013 under revised arrangements that are currently being negotiated. The completion date for projects will be clarified by the time contracts are put in place for successful research proposals.

#### **4.1.2 Other Australian Government Departments**

Several other Australian Government Departments or Divisions within Departments have a direct or indirect interest in the social, economic and / or institutional (SEI) dimensions of climate change adaptation. No opportunities for collaborative arrangements to fund research addressing the priorities in the SEID NARP have been established at present but future funding is possible. The Departments with currently stated interests in the SEI dimensions of climate change are:

- The Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS), within the context of its own research program;
- Attorney-General's Department (AGD), as part of its responsibility for critical infrastructure assessment and planning;
- Department of Agriculture, Food and Fisheries (DAFF), as a complement to its own climate change adaptation research program and the Primary Industries NARP research program;
- Department of Education, Employment and Workplace Relations (DEEWR), as part of its responsibility for employment and workforce planning;
- Department of Sustainability, Environment, Water, Population and Communities (SEWPaC), as part of its responsibilities for implementing environmental conservation programs;
- Department of Innovation, Industry, Science, and Research (DIISR), as part of its responsibilities for innovation within Australian industrial development, and providing research direction and advice to the Commonwealth Government through the Chief Scientist's office; and
- Department of Resources, Energy and Tourism (DRET), as part of its responsibility for energy planning and tourism industry development.

Further areas of interest in these and other departments are likely to become apparent as discussions about climate change adaptation progress within the Commonwealth Government and between NCCARF and Commonwealth agencies.

While no immediate investment opportunities were identified to support SEID NARP research priorities, most of these agencies have budgets that can be directed to research critical to their responsibilities. It will therefore be useful for NCCARF to continue investigating funding and co-funding opportunities with Commonwealth agencies.

#### **4.2 State and Territory Government Organisations**

State and territory governments deliver many of the services necessary for social and economic well-being. Most of these services are vulnerable to climate change impacts, including health, waste management, transport, urban and regional planning, water and energy. Conversely, social and economic factors can affect the adaptive capacity, vulnerability and adaptation success of most sectors and stakeholders.

Climate change adaptation is progressively being integrated into state and territory strategic plans for these and other services. In addition, all Australian states have published strategic plans for climate change that refer to the social, economic and institutional dimensions of climate change adaptation responses. Institutional settings within state and territory governments, and linkages between these governments and the Commonwealth and local governments, can support or hinder effective climate change adaptation based on these strategic plans. State and territory governments thus have an interest in gaining the best possible information about the social, economic and institutional dimensions of climate change.

All state and territory governments have departmental administrative arrangements and research capacity in social, economic and institutional issues. A strength of state and territory research arrangements is that state government departments are able to respond to external research initiatives that align with existing research objectives by contributing state-based resources and support on a project-by-project basis.

In addition, most state governments have chief scientists and science research investment strategies having specific or general reference to climate change adaptation as a key investment area.

There are no opportunities identified at present for program-level partnerships with states or territories to address the priority research questions in the SEID NARP. However, state-based resources may be made available to research initiatives on a project-by-project basis.

### **4.3 Social Services Sector**

The Australian Council of Social Services (ACOSS) develops and promotes socially, economically and environmentally responsible public policy and action by government, community and business. ACOSS' state and territory member organisations assist ACOSS to develop and promote its policies. ACOSS also contributes to the development and promotion of policies by all levels of government, other community organisations and business, and helps non-governmental organisations provide private assistance to vulnerable communities, groups and individuals. ACOSS is aware of the potential for climate change impacts to affect those who are already vulnerable, and is an advocate for research that will help support effective adaptation responses. However, ACOSS has little funding of its own to allocate to research.

### **4.4 Australian Research Council**

The Australian Research Council (ARC) is often the first port of call for many researchers and research institutions seeking additional support for research. Grants offered by the ARC under its *National Competitive Grants Program* (NCGP) include *Discovery Project* and *Linkage Project* grants. Through the NCGP, the ARC aims to support research and research training of national benefit. Responding to climate change and variability is identified as a priority goal under the national research priority of *An Environmentally Sustainable Australia*.

Another recent ARC scheme, *ARC Future Fellowships*, promotes research in areas of critical national importance by giving outstanding researchers incentives to conduct their research in Australia. The aim of ARC Future Fellowships is to attract and retain the best and brightest

mid-career researchers and significantly boost Australia's research and innovation capacity in areas of national importance. Preference is given to those researchers who can demonstrate a capacity to build collaborations across industry, research institutions, and other disciplines.

Over a five-year period (2009-2013), *ARC Future Fellowships* will offer four-year fellowships to 1,000 outstanding Australian and international researchers in the middle of their career. In addition, each researcher's Administering Organisation will receive funding of up to \$50,000 per year to support related infrastructure, equipment, travel and relocation costs. The first 200 Future Fellowships were announced in September 2009.

Opportunities for funding research into the social, economic and institutional dimensions of climate change also exist within the ARC Centres of Excellence scheme. No existing Centre has a specific focus on climate change adaptation but several will or could co-invest in research that would support adaptation-related research and improved adaptation outcomes, including:

- ARC Centre of Excellence for Climate System Science;
- ARC Centre of Excellence for Coral Reef Studies; and
- ARC Centre of Excellence for Environmental Decisions.

#### **4.5 Private Sector**

A wide range of peak bodies for industry sectors, non-government organisations and advisory bodies are aware of the need to adapt to climate change. They may either have access to funds or could lobby for leverage across a range of program areas. Many corporate sector parties are already including climate change adaptation research in their environmental and social research, management and monitoring programs.

While there are currently no collaborative research or research funding opportunities between the private sector and the research community able to focus on the SEID NARP, this sector is likely to be a growing contributor to Australia's knowledge base about these aspects of climate change adaptation. NCCARF will continue to explore future funding opportunities in this area.

#### **4.6 International**

Many international organisations have research interests and priorities that are similar or identical to some of the research priorities identified in the SEID NARP. Even where these research areas appear to be culturally specific, they may benefit from collaborative or parallel research in other cultures. Although no immediate opportunities for program-to-program collaboration have been identified with international organisations, there will be increasing opportunities for international links as the emphasis on climate change adaptation increases globally.

#### **4.7 Summary**

Resources to undertake projects focussed on the priority research questions in the SEID NARP will be available immediately from DCCEE. There are potential funding opportunities during the life of the SEID NARP from other organisations, as set out above, where research projects align with the goals, objectives and responsibilities of these bodies. However, none

are realisable at present. NCCARF will continue to explore investment opportunities for research priorities in the SEID NARP in the medium to longer term.

## **5. Potential Sources of Research Delivery**

This section describes the main research organisations that could help implement research into the SEID NARP priorities. In some cases, these research organisations may have access to resources that could be used to assist with funding the research.

### **5.1 Universities**

Universities employ researchers with wide ranging capabilities for research across disciplines relevant to the SEID NARP, from highly theoretical approaches which challenge the ways we frame problems through to practical problem solving. Most university-based researchers collaborate closely with research clients such as government departments, industry or community organisations; many partner with research groups in CSIRO, government or industry.

University-based researchers provide a highly flexible and responsive national research capacity. Large groups of researchers from several universities can be assembled to tackle complex multi-faceted problems. Universities generally welcome partnership arrangements with Cooperative Research Centres (CRCs), other research groups (including overseas) and government agencies, but consider costs and benefits on a case-by-case basis.

### **5.2 Commonwealth Scientific and Industrial Research Organisation**

The Commonwealth Scientific and Industrial Research Organisation (CSIRO) Climate Adaptation Flagship provides the primary CSIRO focus for climate change adaptation research, including research related to the SEID NARP. The Flagship focuses on two areas particularly relevant to the SEID NARP:

- Future adaptations – understanding how different stakeholders make decisions about adaptation, developing adaptation options suited to different regions and communities, and analysing the benefits of adaptation and key policy actions through modelling; and
- Future drivers - understanding how climate change will affect Australia’s international comparative advantages, and how changes elsewhere in the globe (particularly in the Asia-Pacific) will affect Australia.

CSIRO considers partnerships in research investment on a project-by-project basis depending on the mutual alignment of interests. Examples include long-term partnerships in CRCs and other research ventures where the prospects of end-user engagement and research effectiveness are likely to be increased by partnering. CSIRO is not a funding agency *per se* but does co-invest from time to time when there are distinct opportunities to align its research interests with those of partner organisations. This includes co-investments in three climate adaptation clusters: Southeast Queensland, Health and Coasts.

Through these and other activities the Climate Adaptation Flagship is currently working with:

- State and federal government agencies;
- Rural industry research and development corporations;
- Private industry;
- Industry and farmer groups;
- CRCs;
- Universities; and
- International science collaborators.

### **5.3 State Departments and Agencies**

All state and territory governments have departmental research capacity relating to social, economic and institutional factors. A strength of state and territory research arrangements is that these departments can both initiate research projects and respond to external research initiatives that align with existing research objectives. In addition to research capacity, state and territory agencies can often contribute state-based resources and support on a project-by-project basis that ensures that research outputs are well-targeted to impending tactical or strategic decisions or to long-term planning of programs.

State departments and research agencies are likely to support partnership arrangements on a project-by-project basis to address the priority research questions in the SEID NARP where the priorities align with their own strategic and operational plans and where the project meets the competitive funding arrangements in the department or agency.

### **5.4 Adaptation Research Network for the Social, Economic and Institutional Dimensions of Climate Change**

The NCCARF Adaptation Research Network for the Social, Economic and Institutional Dimensions of Climate Change (SEIDARN), hosted by the University of Melbourne, has a membership of over 300 individuals from universities, government research institutions, and industry. Collectively, the members have a wide range of research capacity and have knowledge of the pathways to public and private sector research investment funds. Direct cash investment is unlikely to be secured through these sources but in-kind research time is possible.

The capacity of SEIDARN to develop appropriate high quality research groups to address the research priorities in the SEID NARP is based on the following qualities:

- The SEIDARN convener, co-conveners and theme leaders collectively are leading Australian climate change researchers in the SEID sector;
- The member institutions of SEIDARN have access to a very wide researcher base;
- SEIDARN has collaborative relationships with other NCCARF research networks that can provide considerable expertise to this research area as appropriate; and
- SEIDARN partners and members have considerable expertise in developing integrated cross-disciplinary research projects.

SEIDARN will play a key role in building national consortia to address the research priorities. It supports the NCCARF knowledge adoption team's efforts to communicate the outputs of research to end users.

## **5.5 Cooperative Research Centres**

Cooperative Research Centres (CRCs) bring together researchers from universities, CSIRO, other Australian and state government research organisations, private industry, and/or public sector agencies in long-term collaborative research arrangements. CRCs are funded to support research, development and education activities to achieve real outcomes of national economic and social importance.

Several CRCs could deliver research addressing the priorities in the SEID NARP, including:

- Cotton Catchment Communities CRC (socio-economics listed as an area of research expertise);
- CRC for Aboriginal Health (social science-based research listed as an area of expertise);
- CRC for Remote Economic Participation (the CRC's research programs are concerned with the development of regional economies enterprises and individuals);
- eWater CRC (socio-economic uncertainty listed as an area of research expertise);
- Future Farm Industries (economics and social science listed as areas of research expertise); and
- Smart Services CRC (social networks listed as an area of research expertise).

Opportunities for collaboration with these CRCs to deliver and potentially fund national level research into social, economic and institutional dimensions of climate change are still to be fully explored. Opportunities are likely to exist on a project-by-project basis. NCCARF will continue to explore future opportunities for collaboration with these CRCs and others that may be established during the life of this NARP.

## **5.6 Geoscience Australia**

Geoscience Australia (GA) is a prescribed agency within the Department of Resources, Energy and Tourism (DRET). It conducts geoscience research to inform government policy, including development of fundamental data and information products needed for climate change adaptation. Other economic and demographic information is being developed to support scenario modelling for assessing social and economic aspects of climate change impacts and vulnerability

GA provides a national dynamic mapping system that places current circumstances into a historical context at national, regional and local scales. This mapping system is designed to support and facilitate decision-making, and to act as a national standard.

GA's research and policy advice is supported in large part through the agency's appropriated budget, and through collaborative or co-funded projects with the Australian, state and local governments, CRCs, universities, and industry partnerships. GA seeks partnerships to

develop, maintain, and value-add to geoscience information to inform government policy and the public with an emphasis on resilience. GA is not a funding agency, but does co-invest in areas of interest to DRET's portfolio.

## **5.7 Non-Government Organisations**

Many non-government organisations (NGOs) have a national or state focus on conserving and improving Australia's socio-economic well-being. They are often supported by private funds and volunteer commitment and are guided by leading scientists. They have been instrumental in providing information to support policy development, planning and initiatives relevant to the research priorities of the SEID NARP.

There is thus strong capacity across Australia to undertake and contribute to research efforts that address the priorities in the SEID NARP. Commitments of financial or other research inputs from these organisations could become apparent once a research call is issued. NGOs active in the SEID area include:

- Centre for Climate Change Impact Management (C2IM) – <http://www.c2im.org.au/> ;
- Planning Institute Australia (PIA) – <http://www.planning.org.au/> ;
- Social Ventures Australia (SVA) – <http://www.socialventures.com.au/> ; and
- The Foundation for Rural and Regional Renewal (FRRR) – <http://www.frrr.org.au/>

## **5.8 Regional and Local Partnerships for research**

There are an increasing number of regional and local partnerships across Australia between universities, other research organisations, and state, regional, and local agencies that have research interests in adaptation to climate change. These partnerships generally seek to deliver research to support development of integrated climate change vulnerability and adaptation strategies, of which social, economic and institutional settings, influences, impacts and responses are critical elements. Community groups, local government and extensive regional and local networks of experienced and knowledgeable citizens, add to the richness of regional and local research capacity and to end user commitment.

A major example is the South East Queensland Climate Adaptation Research Initiative (SEQCARI), which was established to assess South East Queensland's vulnerability to climate change and identify and develop practical, cost-effective strategies to help the region adapt. This research initiative is supported by funding from CSIRO Climate Adaptation Flagship, Griffith University, the University of the Sunshine Coast and the University of Queensland, the Queensland Smart State Innovation Fund, and the Commonwealth Department of Climate Change and Energy Efficiency. State and local governments, industries and community groups are key participants in the research program, which involves more than 30 scientists. It is guided by an advisory committee representing major stakeholders in the region.

## **5.9 Role of the Adaptation Research Network for the Social, Economic and Institutional Dimensions of Climate Change**

The Adaptation Research Network for the Social, Economic and Institutional Dimensions of Climate Change (SEIDARN), hosted by the University of Melbourne and with over 300 members, will play a key role in implementing the SEID NARP. Activities undertaken by the Network will include:

- Promoting the research priorities identified in the SEID NARP;
- Facilitating the exchange of information and sharing of resources within the Network;
- Promoting and supporting research collaboration;
- Identifying research funding sources, and assisting in calls for funding applications under the Adaptation Research Grants Program; and
- Developing the capacity of young researchers.

## **5.10 Summary**

Research capacity to undertake projects focussed on the priority questions in the SEID NARP is available from a wide range of providers, including universities, CSIRO, state agencies, private organisations and CRCs. Since most research providers are members of SEIDARN, this body is well-placed to facilitate the formation of the type of integrated research consortia that will be necessary to meet the challenges of climate change adaptation research in this area. However, as some research providers may not be members of SEIDARN, it will also be necessary to ensure that any call for research proposals is widely publicised in the relevant media and webpages.

## **6. Strategy for National Coordination**

While there are currently few funding sources available to support research into priority questions identified by the SEID NARP, the climate change adaptation research agenda within the SEID research area is evolving rapidly. A long history of high-quality social, economic and institutional research and analysis provides a good platform for developing further capacity in climate change adaptation research related to SEID.

### **6.1 Immediate investment**

DCCEE is able to allocate up to \$6 million from the Department's \$27 million Climate Change Adaptation Research Grants Program (ARGP). This appears to be the only program-level funding immediately available to initiate new research addressing the nine priority topics identified by the SEID NARP and shown in Appendix 1. Of these nine, three have been identified by DCCEE as being a priority for immediate investment for the climate change adaptation agenda of the Australian Government.

The grants funding is available from 2010/11, and all projects funded through this program will need to be completed by June 2012<sup>2</sup>.

A wide range of research providers (e.g. state/territory organisations, CSIRO, universities) appear to be prepared to partner with new research initiatives on a project-by-project basis. The NCCARF SEIDARN is well placed to assist with building research consortia and securing additional resources for specific project proposals.

DCCEE and NCCARF will develop a program of investments to be placed through open research calls, targeted commissioned research, or direct collaboration with other funding agencies to address the highest priority research questions in the SEID NARP.

NCCARF will:

- Provide information about the research opportunities on the NCCARF website;
- Engage with the SEIDARN to promote the program to researchers and to broker the development of research consortia; and
- Coordinate evaluation processes associated with the identification of research projects.

This research investment program will target, for immediate investment, the nine priority research topics identified in Appendix 1. These nine research priorities are considered to be a logical first choice to ensure a coherent body of information is built and meet the priority information needs of policy and decision makers at the present time. Following this process NCCARF, in consultation with policy and decision makers and other end users, will identify the next set of SEID NARP priority research topics for investment at a later time.

NCCARF will also play a lead role in embedding the information and knowledge outputs from the research into Australian communities, and in the communication of research outputs to policy and decision makers at all levels.

## **6.2 Building the Program**

NCCARF and SEIDARN will continue to build the research program nationally by promoting the research priorities in the SEID NARP and providing opportunities for members to share information and resources related to this research. They will also enhance international links to Australia's research program through NCCARF's visiting scientist program and by other means.

A research program started immediately may encourage other funding organisations to identify and allocate funds towards the priority research questions in the SEID NARP. NCCARF and the DCCEE will explore options to build the national research base, such as by ensuring that the funding opportunities that are developing across a range of Australian Government departments are coordinated and take into account the priorities in the SEID

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<sup>2</sup> The end date for projects may be extended to June 2013 under revised arrangements that are currently being negotiated. The completion date for projects will be clarified by the time contracts are put in place for successful research proposals.

NARP and the initial ARGP investments and that other potential funding bodies are aware of opportunities to collaborate in, co-fund or expand proposed research projects.

## **7. Impediments and Risks**

Australia has a small research community relative to the challenges of building and delivering a national research program to address the priorities in the SEID NARP. While existing research capacity in the social sciences will provide a good platform, building further research capacity will be necessary.

## **8. Monitoring**

NCCARF will monitor the progress of research commissioned through the proposed research call to identify emerging gaps and further research needs. It will also maintain continuing dialogue with key stakeholders and the research community. The Implementation Plan will be updated periodically.

NCCARF will also synthesise research outcomes in the area of climate change and social, economic and institutional dimensions as they evolve through a dedicated research program.

Success in developing and implementing research directed towards priorities in the SEID NARP will be measured in terms of the extent to which:

- End users are engaged throughout the research cycle;
- The capacity of the Australian research community is expanded;
- Research products are adopted by end users, primarily policy and decision makers;
- Research collaboration and coordination occurs;
- The research budget is built nationally;
- Financial resources are leveraged to address the priority research questions; and,
- The SEID NARP promotes further adaptation research.

## **10. Communication and Engagement**

Effective uptake of research outcomes by end users results best where they have been involved throughout research activities, from the initial definition of the scope and focus of particular research projects to the determination of how new information and insights are to be communicated to specific groups or more broadly to interested communities. For a research area such as the social, economic and institutional dimensions, in which Australia's policy community and decision makers are directly interested and involved, end users should also be as directly engaged as possible in research activities and interpretation. This involvement may take the form of a steering or advisory committee, taking observations, helping to develop or complete surveys or other options.

NCCARF and the Adaptation Research Networks have established a number of mechanisms to involve end users in the research process. These mechanisms include

linking end users and researchers in the research planning and development process and identifying information needs through symposia and stakeholder workshops. End user engagement will be an important factor for research projects commissioned from the research call for the SEID NARP. The communication of research outputs will be tailored to suit the information needs of identified and targeted end users.

## Appendix 1      Priority Research Questions in the SEID NARP

In the area of ***Understanding vulnerabilities and adaptive capacity:***

- Topic 1      The development and application of methods for assessing vulnerability and adaptive capacity that engage and harness the knowledge and skills of individuals, households, communities, businesses, industries and governments.
- Topic 4      Identification of the capacity of individuals, households, communities, businesses, industries and governments to adapt to climate change, and of options to enhance this capacity.
- Topic 5      Understanding the equity dimensions of current and future vulnerability and adaptation including:
- a. the issues for specific population groups who have particular vulnerabilities and limited capacity to adapt by virtue of their socio-economic status, skills, livelihood, cultural or linguistic background, or other characteristics such as age; and,
  - b. understanding the interaction between existing stressors and climate change, and the implications of this interaction for vulnerability and adaptive capacity.

In the area of ***Understanding and overcoming the barriers and limits to adaptation***

- Topic 6      Understanding the cognitive and affective dimensions of adaptation, including:
- a. the knowledge, perceptions and emotional responses of people and groups regarding climate risks;
  - b. the time horizons of people and groups who make decisions about adaptation; and,
  - c. the degree to which people and groups feel empowered to adapt.
- Topic 7      Understanding enablers and barriers to collective action, including:
- a. how shared symbols, beliefs and practices enable or constrain adaptation;
  - b. how economic factors, including distribution of capital and investment, enable or constrain adaptation;
  - c. how social practices and opportunities enable or constrain adaptation;
  - d. how the distribution of power in decision making enables or constrains adaptation.
  - e. what differing types of decision makers consider to be the goals of adaptation (e.g. what defines 'successful' adaptation in their eyes); and,
  - f. what and how differing types of decision makers know about the vulnerability of others.
- Topic 9      Measures to value adaptation. Understanding how to assess and value adaptations to climate change, including the value of opportunity costs, avoided damages, residual impacts, and benefits gained. This may involve:
- a. reviewing and determining the suite of assessment and valuation methodologies that are most appropriate for use by Australian adaptation policy and decision-makers;
  - b. identifying the limits to the use of these methodologies; and,
  - c. testing the identified methodologies against relevant current policy in Australia.

In the area of ***Understanding governance, institutions and decision-making:***

- Topic 11 Analysis of existing responses from public and private institutions to climate change risks, and assessment of proposals to improve the effectiveness, efficiency and equity of future responses, including:
- a. analysis of responses in the public, private and third (civil society) sectors; and,
  - b. analysis of the distribution of roles, responsibilities and capacities of different levels of government and cross-jurisdictional bodies.
- Topic 12 Understanding how laws and legal institutions, including regulatory instruments, support or impede adaptation planning and practice, and identifying reforms needed to reduce obstacles.
- Topic 14 Assessing the potential for, and limits to, market-based adaptation measures, including insurance markets.