Bushfire & Natural Hazards CRC

An introduction for research project end user representatives

July 2015

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1 Introduction

This document has been prepared for people nominated as end-users of the Bushfire and Natural Hazards Cooperative Research Centre (BNHCRC).

BNHCRC research is, first and foremost, driven by the needs of end users. Your role is to work with researchers as part of integrated project teams to ensure their work is meeting the needs of your organisation as well as those facing similar issues across Australia. With other end users, you can ensure that CRC efforts are used to address the problems facing management of natural hazards in Australia today.

CRC research is long term, developing from research into adoption over the 8 years of funding the CRC has secured, and potentially beyond. The projects will be shaped by your knowledge, experience and understanding of the environment in which you operate. The research projects themselves may not deliver tangible outcomes for 3 years or more, but the process of identifying how that research can and should be used starts now. We ask that you keep this in mind as an end user, and think more broadly than the issues of this season or this year, instead looking 3, 5 or 10 years into the future.

As an end user of the CRC, you will come into contact with some of the best researchers from Australia and overseas working in their fields, as well as other practitioners trying to address similar problems to you. This is a unique opportunity to develop your networks, and I hope you make the most of it.

The remainder of this document describes the purpose, structure and arrangements for researchers and end users, as background for your role. The CRC is still establishing itself, so arrangements may be altered to better suit the research and end-user processes needs to deliver the best outcomes.

Each research Cluster has a Lead User Representative, who are detailed in Section 8 of this document. Please feel free to contact them if you have any queries about your role.

Welcome to the Bushfire & Natural Hazards CRC. We hope you enjoy the experience, actively engage with the researchers and help shape a valuable and productive research program.

Michael Rumsewicz
Research Manager
Bushfire and Natural Hazards Cooperative CRC

2 Background

The Bushfire and Natural Hazards CRC purpose is to conduct high quality applied research inspired by end-users, to:

- reduce the risks from natural hazards;
- contribute to the national disaster reliance agenda;
- build Australian research capacity; and
- enable Australian small-to-medium enterprise to be innovative in natural hazard products.

End user engagement is central to the CRC's operation. To place this engagement in context, a model of a "Research to Capability" process is depicted below, together with examples of how the process is being enacted within the Bushfire and Natural Hazards CRC. The Bushfire and Natural Hazards CRC's core business is focussed on the top four boxes, but at the same time the CRC must be aware of the end user environment towards which its research is directed (bottom two boxes).

Successfully delivering on the purpose of the CRC requires teams of high quality researchers and end users working together to:

- frame the research questions;
- understand the context of the industry;
- review findings as research progresses;
- engage stakeholders; and
- identify paths to utilisation.

3 Setting the research directions

A two-day workshop was held in Melbourne on 25-26 March 2013 with key participants from the states and territories, the Commonwealth, a number of NGOs and selected hazard experts to scope out the problems needing particular attention.

A set of high-level problem statements were developed covering strategic issues aligned with the Council of Australian Governments (COAG) National Strategy for Disaster Resilience (NSDR) and the National Bushfire Policy Statement.

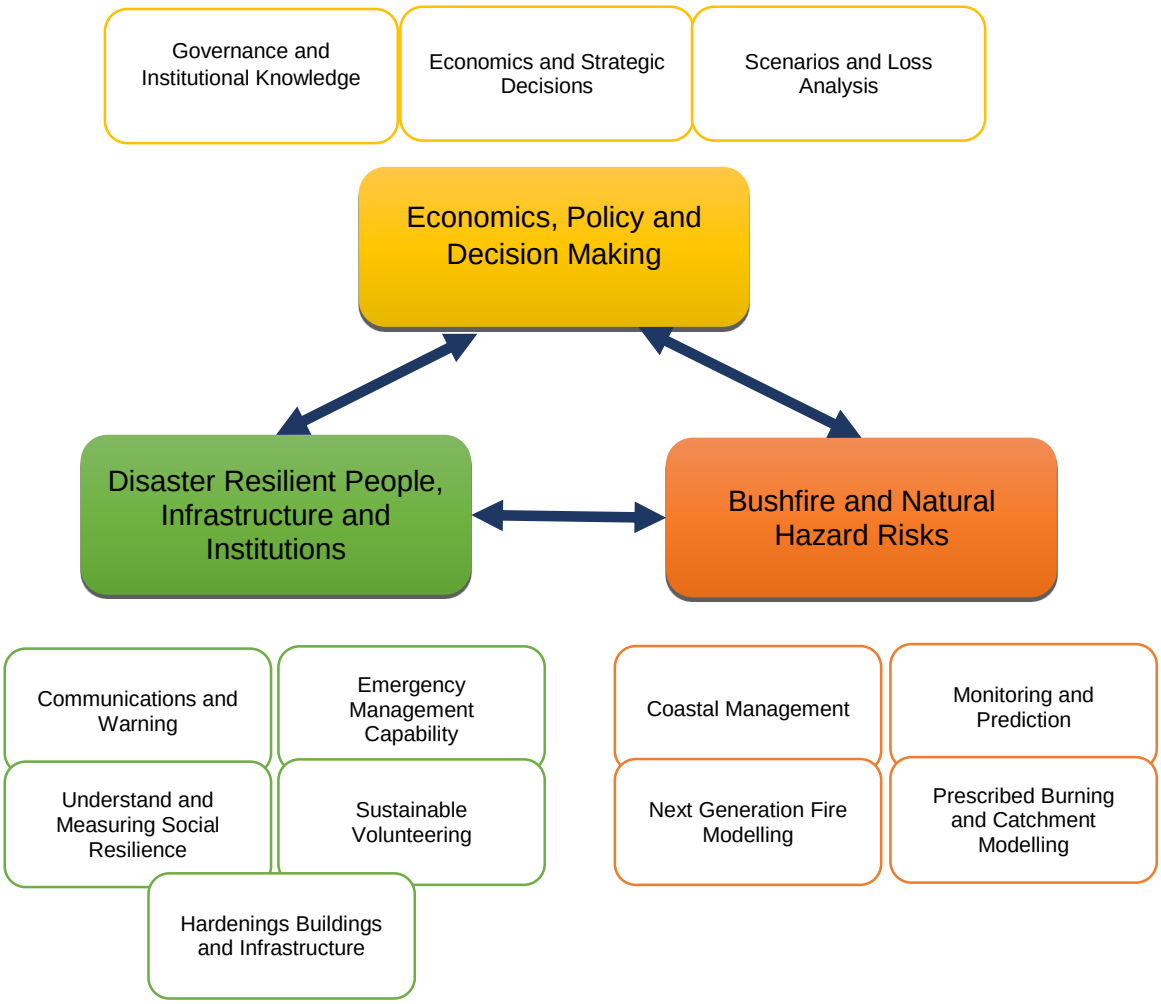
The problem statements were considered in the context of natural hazards organised around five main research themes:

- Data and Knowledge;
- Disaster Resilience;
- Decision Support and Resource Investment;
- Risk Mitigation Policy and Planning, and
- Emergency Management Practice.

The workshop led to development of a call for research proposals to address key knowledge gaps in the Bushfire and Natural Hazards space, with initial proposals submitted in April 2013. A further call for proposals went out in April 2014.

The research proposals were reviewed for alignment to identified needs and technical excellence. This process has led to 39 projects being established.

From this process three overarching themes of research, based on twelve clusters of interrelated projects, have been formed as the basis for the Bushfire and Natural Hazards CRC user driven research program. The overall research program is shown below.



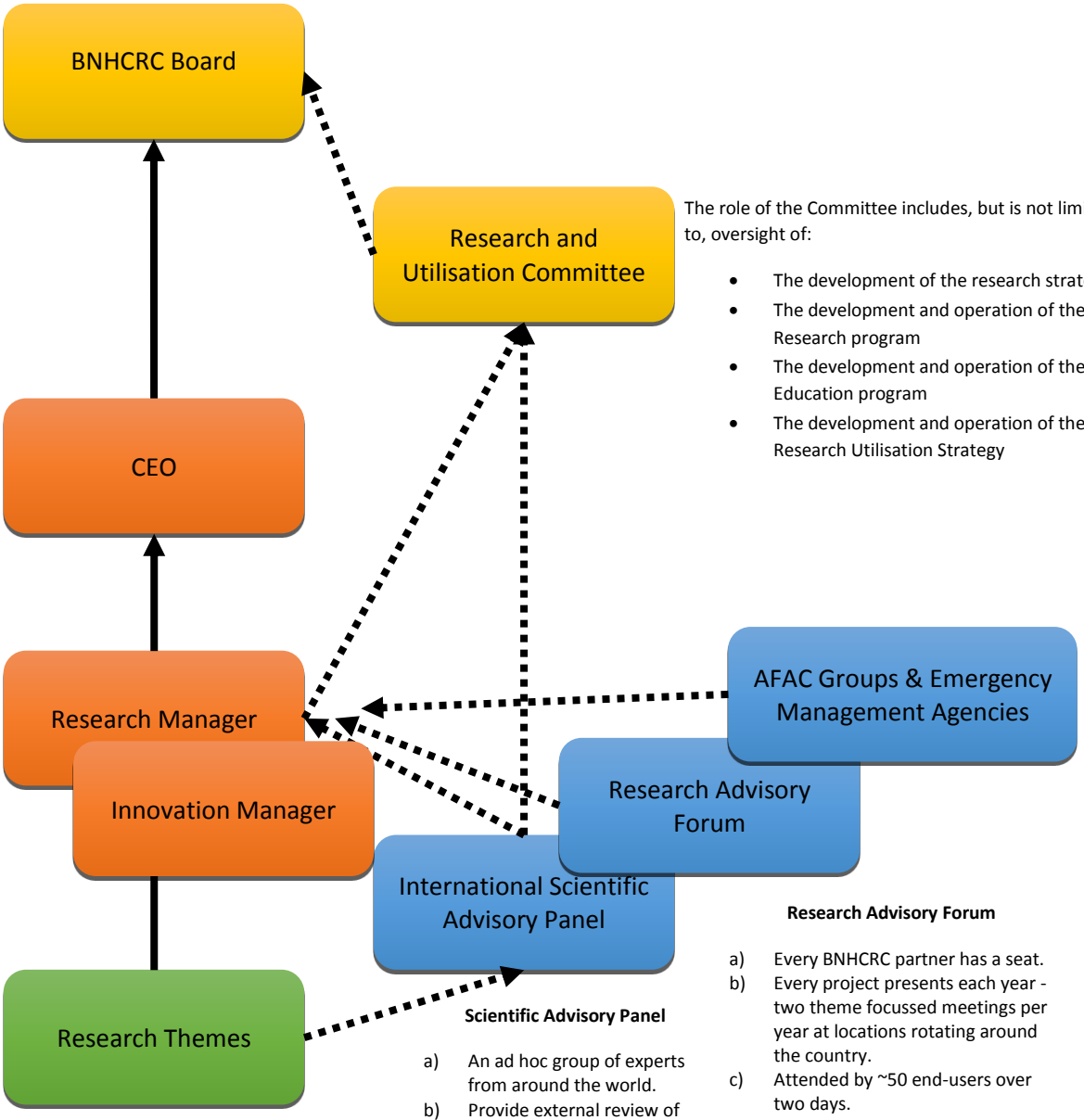
Economics, Policy and Decision Making deals with economics and the interface between risk-based priorities and the practice of decisions to allocate resources where the potential for some of the greatest tangible benefits can be made.

Resilient People, Infrastructure and Institutions aims to improve the conceptualisation of resilience and the factors that both promote and inhibit its development. Improved understanding of these factors is intended to contribute to and optimise the development of a capability to identify vulnerability, manage the risk and enable resilience.

Bushfire and Natural Hazards Risks seeks better forecasts of likely events and precursor conditions; greater accuracy of forecast tools and more timely forecasts. This leads to increased preparedness for the impacts of natural hazards, improved communications and warnings and enhanced ability to predict and mitigate the risk.

4 Overall Governance of the Research Program

The key roles in the overall governance of the research program is shown in the figure below.



The role of the Committee includes, but is not limited to, oversight of:

- The development of the research strategy
- The development and operation of the Research program
- The development and operation of the Education program
- The development and operation of the Research Utilisation Strategy

Scientific Advisory Panel

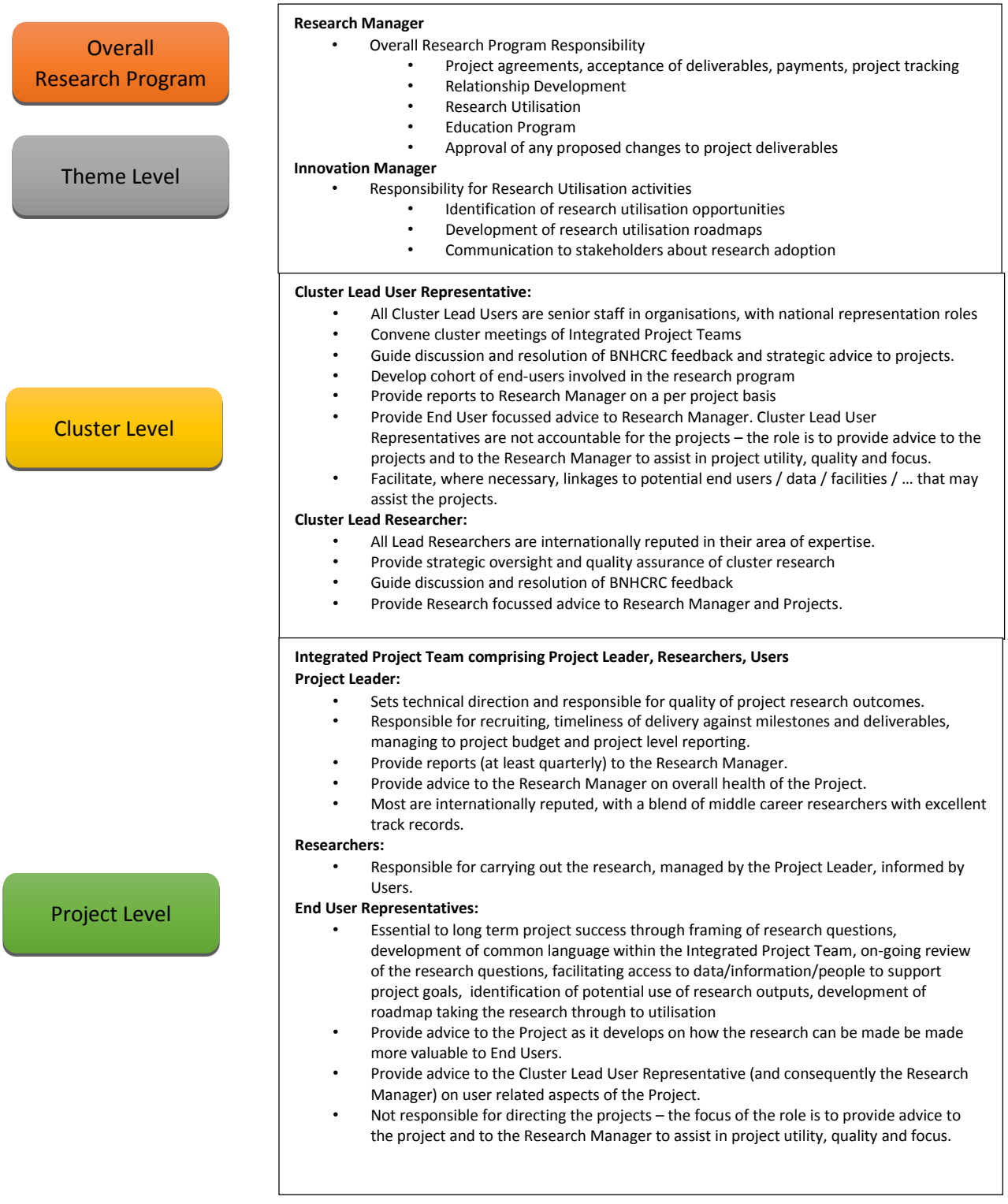
a) An ad hoc group of experts from around the world.
b) Provide external review of BNHCRC Research Quality
c) Provide advice on future research directions

Research Advisory Forum

a) Every BNHCRC partner has a seat.
b) Every project presents each year - two theme focussed meetings per year at locations rotating around the country.
c) Attended by ~50 end-users over two days.
d) Provides feedback on direction, progress, quality and user needs.
e) Provides an opportunity for cluster and project level workshops between researchers and end-user representatives.

5 Maintaining and Refining Research Focus

The key roles in the day-to-day operations of the research projects are shown in the figure below and are aimed at ensuring the delivery of a high quality, relevant research program that seeks to develop knowledge that can be developed into high impact, usable outputs for CRC stakeholders.



6 Identifying mechanisms for knowledge application

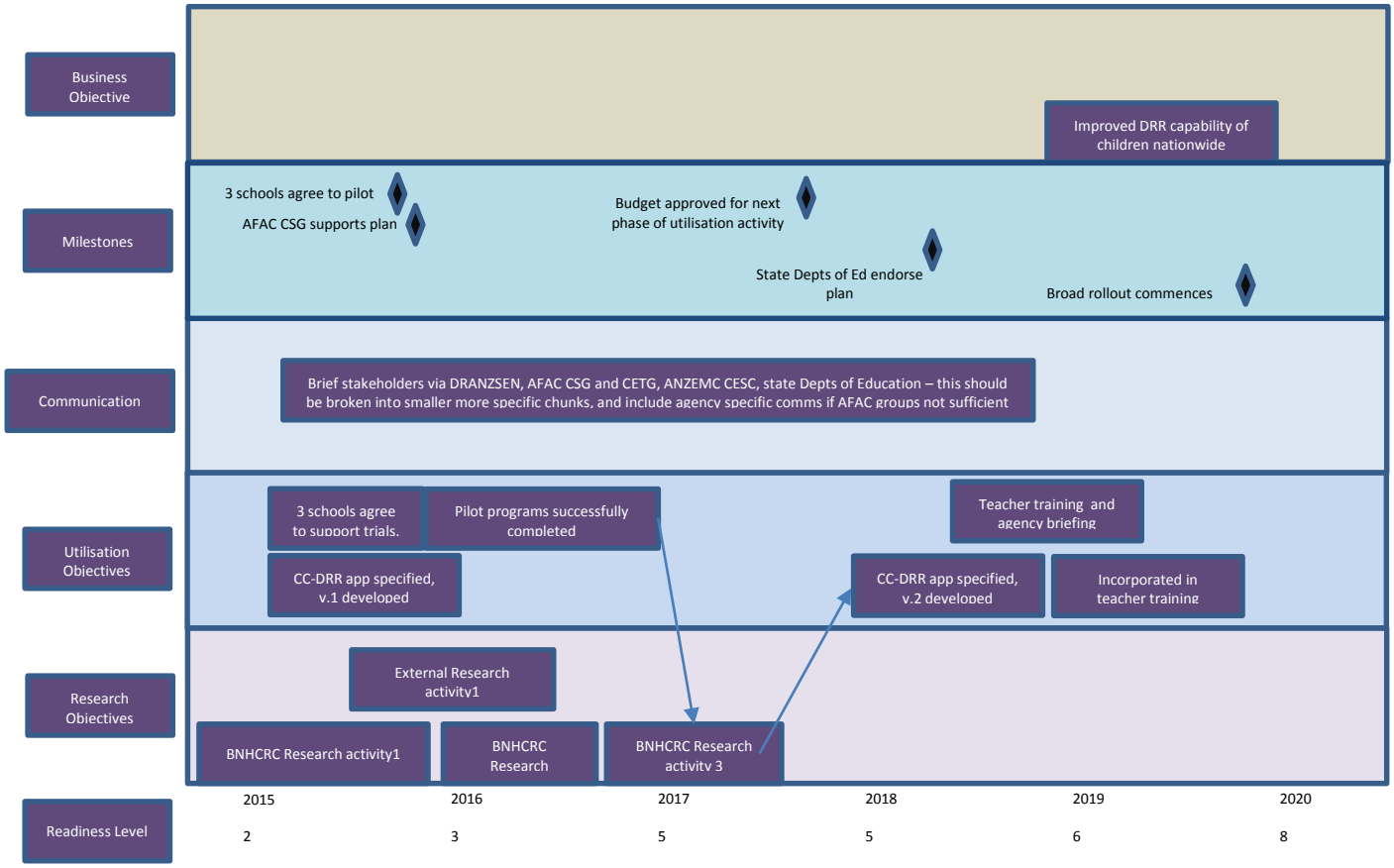
Each Integrated Project Team will inevitably develop its own local culture, language and way of working. For the initial tranche of BNHCRC funded projects, the aim is to develop knowledge through high quality research that has potential use by the BNHCRC stakeholders. The process of recognizing the form that such use may take, and the path to get it there, starts at the beginning of the projects, not at the end. The end user members of the integrated project teams are essential to successful utilisation of research project knowledge.

To assist in developing a common understanding between researchers, users and management, the BNHCRC will be assisting projects to develop Utilisation Roadmaps. These Roadmaps are a device for establishing a common understanding of where projects are at any given time, significant milestones that need to be achieved, identification and communication with key stakeholders and the effort required to convert the knowledge produced into a usable output.

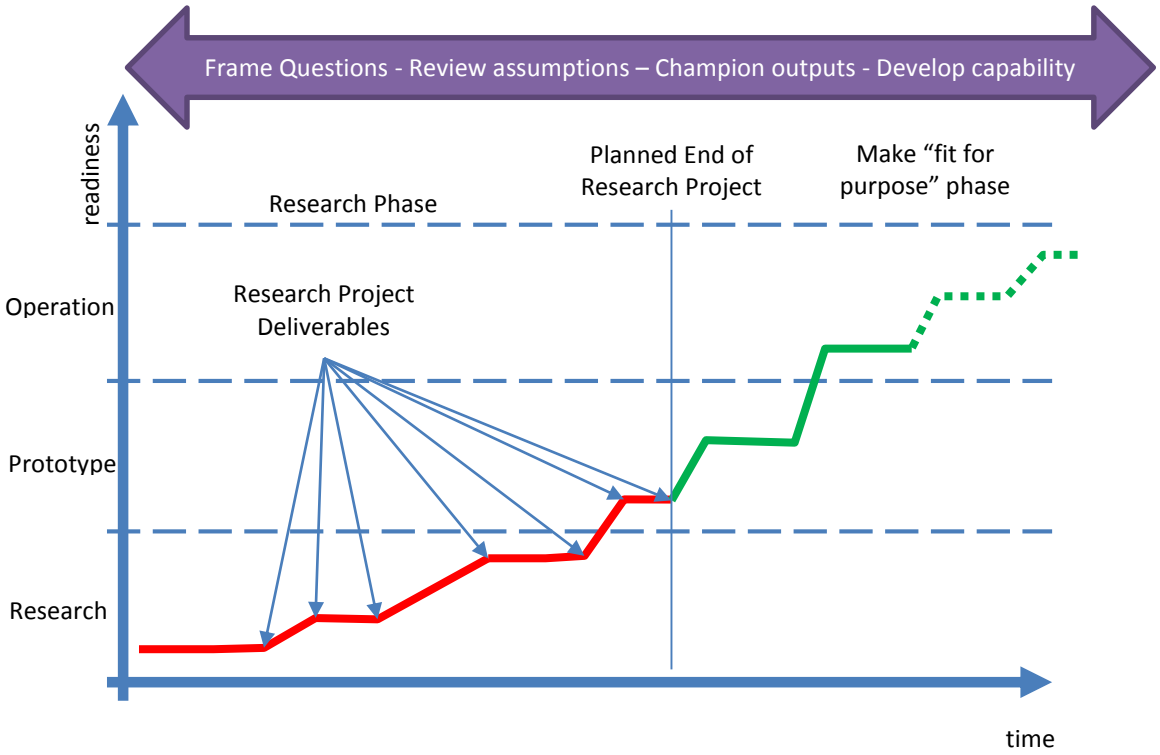
An example, for purely illustrative purposes, is shown below – the details will vary from project to project as required. The aim in undertaking this process is ensure that the entire integrated project team is on the same page regarding the relative position of research project deliverables compared to take up by end users. This process should be on-going, commence in the project definition phase, and assist in managing expectations and identifying potential barriers to utilisation before projects progress too far. The active participation of users is essential to the success of the projects, as the users have the domain knowledge to frame the important questions, recognise how the research might be used, and identify the path to utilisation.

Child Centred Disaster Risk Reduction Utilisation Roadmap

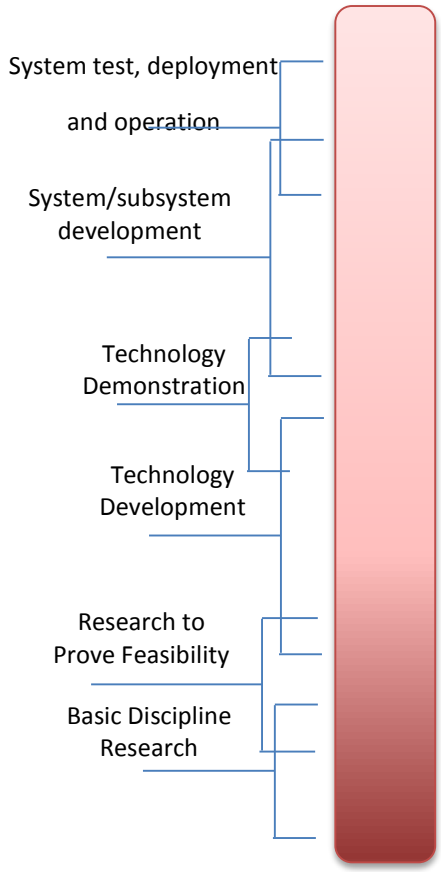
SAMPLE ONLY: specific outputs, timelines, stakeholders, ….are for illustration purposes only



The roadmap also includes an assessment of “readiness level” of potential products at different points in time. The readiness level for a usable product may vary significantly across projects.



The readiness levels use a simplified version of Technology Readiness Levels developed by NASA (see below), a 9 point scale where 1 represents “blue sky research” and 9 describes a fully operational mission critical system.



TRL 9: Actual system "proven" through successful system and/or mission operations

TRL 8: Actual System completed and "qualified" through test and demonstration (in the operational environment)

TRL 7: System prototype demonstration in the planned operational environment

TRL 6: System/subsystem model or prototype demonstration in a relevant environment

TRL 5: Component validation in a relevant environment

TRL 4: Component validation in a laboratory environment

TRL 3: Analytical and experimental critical function and / or characteristic proof of concept

TRL 2: Technology concept and / or application formulated

TRL 1: Basic principles observed and reported

Adapted from: Technology readiness assessments: A retrospective
John C. Mankins, Acta Astronautica, Volume 65, Issues 9–10, November–December 2009, Pages 1216–1223
See also http://en.wikipedia.org/wiki/Technology_readiness_level for a general introduction to the topic.

While the NASA approach is technology focussed it can be readily adapted to the wide range of projects being carried out within the BNHCRC. The important point is to ensure that Integrated Project Teams understand and agree where the major research activities of the projects end and the migration to utilization focused activities begins. Note that this does not mean that utilization activities only commence when the research phase is completed - an understanding of the potential utilization of the research must be developed early in the *research* phase. Nor does it mean the research necessarily ends at this point. What is needed is an idea of what "fit for purpose" means for each project and when research outputs can begin to be drawn out into usable "products" – sometimes a mission critical system (TRL 9 on the NASA scale), a desktop program for long term scenario planning (maybe TRL 5), documented processes, training packages, services, or even simply reports. The final readiness level may vary significantly between projects.

The BNHCRC research projects are not necessarily expected to produce immediately usable products within the project – for technology based projects the outputs will most likely be at most at a readiness level of 4 or 5 at completion. However, the path to utilization will have been identified well before the end of the research project, and plans put in place for taking the research outputs through to utilization, including identification of resources required. The specifics will vary from project to project.

7 Research Program and Key Personnel – at a glance

Full, uptodate listings of key personnel can be found on the Bushfire and Natural Hazards CRC website, www.bnhcrc.com.au

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Cluster	Cluster Lead User Representative	Contact	Lead Researcher	Contact
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