



Collaborative climate science research approaches – a summary

The opportunity

CSIRO is a world leader in climate research, partnering with industry, community and other researchers to produce innovative climate system science information.

There is a huge opportunity for this research to have a significant impact to inspire climate solutions and actions and build resilience to climate change.

“Co-production can lead to more ownership. A better [set of] options for the future, and something that actually will be owned and taken forward by the people who are going to use it.”

– interviewee

The challenge

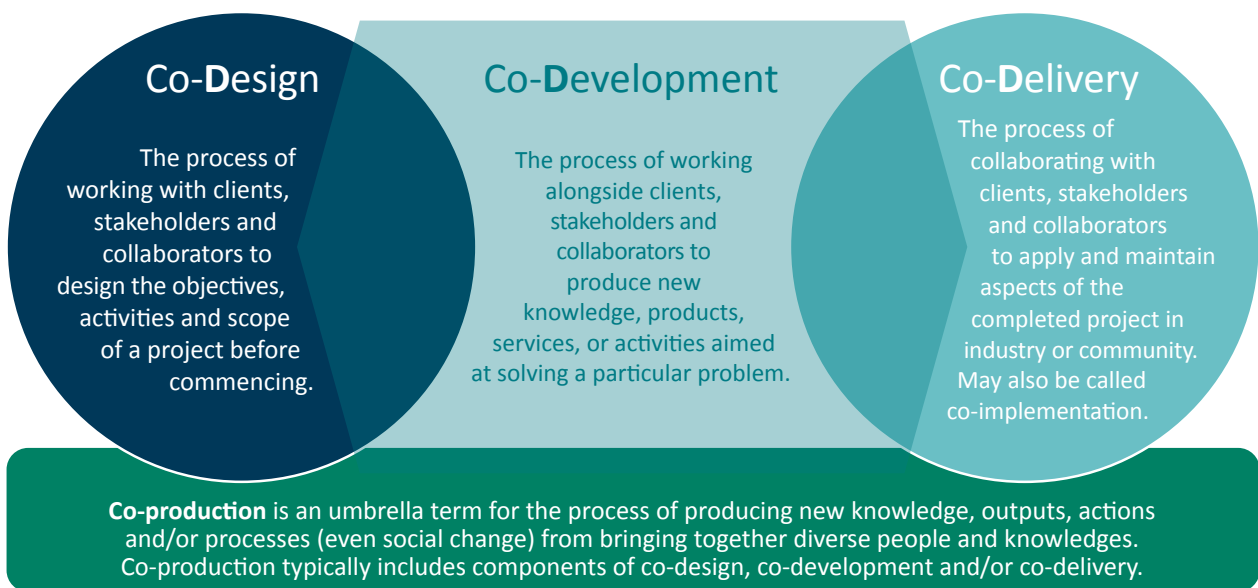
Close engagement with clients, industry, community, and other key partners and stakeholder groups is key for our research to make a difference.

Collaboration is easy to talk about but identifying where to start and how to engage with others is difficult. One way to address this challenge in research projects is to classify ‘collaboration’ into different modes: co-design, co-development and co-delivery. Project teams can then better understand what activities are needed to generate meaningful impacts.

Purpose

This document is a concise reference for collaborative research approaches. It aims to raise awareness of different modes of collaboration that can be integrated in research projects (co-design, co-development, co-delivery, or Co-3D for short) for the CSIRO and others. It provides clarity on what these approaches are and when/how to use them.

Co-3D



COLLABORATION

Working closely with others to create or achieve a shared objective, project, activity or output.

The term ‘collaboration’ is frequently abbreviated as ‘co-’ as in the terms above: co(laborative) design | development | delivery

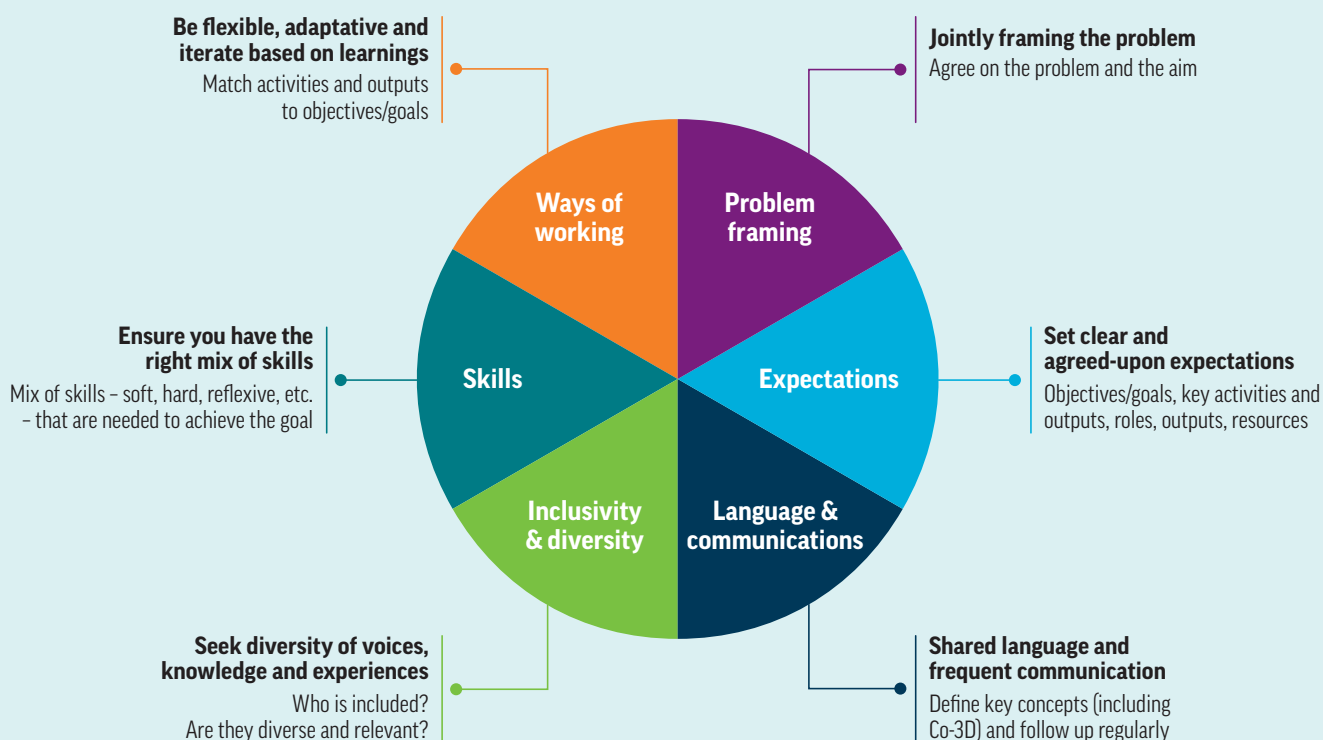
Enhancing the impact of co-design, co-development and co-delivery (Co-3D)

What makes for good co-design, co-development and co-delivery? Underpinning principles

To be effective and meaningful, collaborative approaches in research projects should be guided by some key underpinning principles.

Principles refer to core mindsets, values, skills and practices. Figure 1 highlights some principles that have been found to be important for the success of co-design, co-development, and/or co-delivery processes. These are not exhaustive and project teams and partners are encouraged, at the start of a project, to identify what they consider are critical for underpinning and guiding their collaboration.

Figure 1. Examples of principles for supporting collaborative approaches to research



PROBLEM FRAMING

– for example, convene a workshop or discussion at beginning of the project to collectively identify and agree upon the problem (and solutions) that the project will contribute to.

EXPECTATIONS

– decide up-front how engagement activities will be run, what results will look like and how they will be used, who is included when, and how much time and resource is required.

LANGUAGE AND COMMUNICATIONS

– clarify key concepts, including collaboration concepts, and be mindful of shifting expectations. Use frequent communication to keep everyone up to date.

INCLUSIVITY AND DIVERSITY

– consider early if everyone who should be involved is included and whether diverse voices are enabled and captured, especially from the end-user perspective and from multiple disciplines.

SKILLS

– value and reward soft skills like listening, empathy, humility and patience. They are essential for building and retaining relationships and trust and having effective, open communication.

WAYS OF WORKING

– be flexible, adaptive and reflective iterating based on learnings.

How to decide if a project would benefit from integrating co-design, co-development and/or co-delivery?

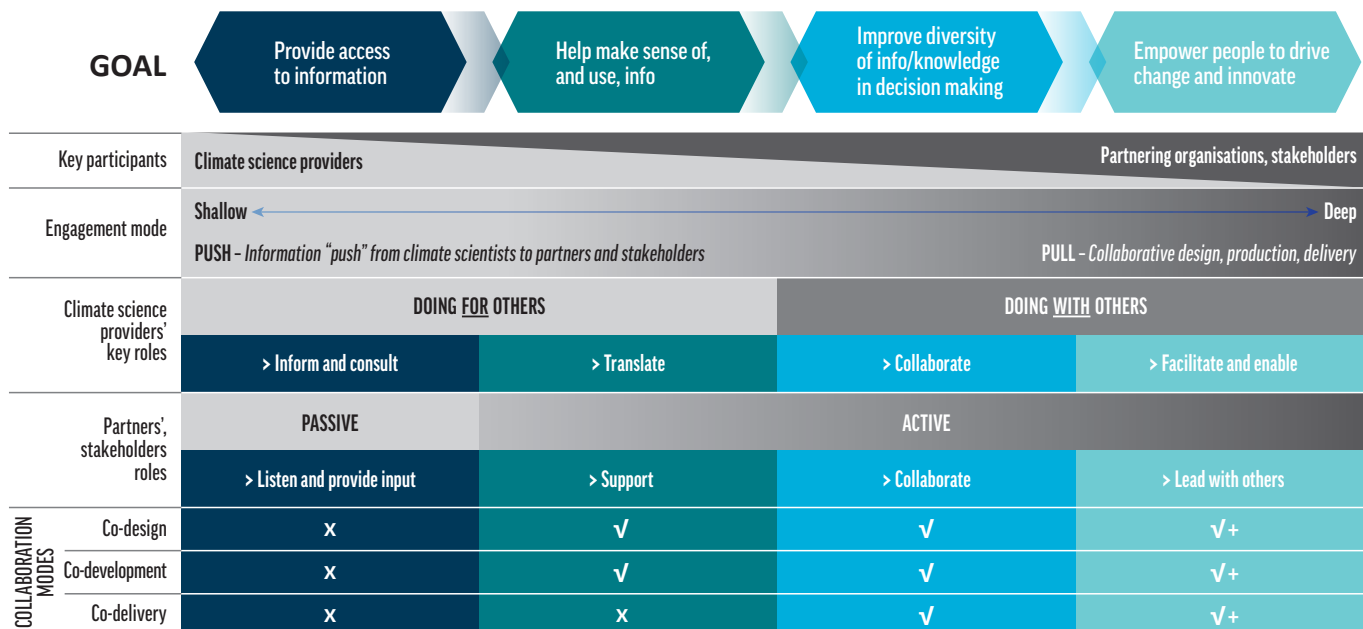
The decisions around integrating (or not) different collaborative modes of research (co-design, co-development, and/or co-delivery) depend on a range of considerations (Figure 2).

Key insights from the frameworks:

- Modes of co-design, co-development and co-delivery engagement can be mixed.
- There is not necessarily a single 'right' way of doing engagement, rather each mode achieves different aims and thus the outcomes should be intentionally matched to the objectives.
- It is important to plan for and use skilled capability and recognise these skills – relationship building, trust, communication – as well as the time and effort they take.



Figure 2. Spectrum of engagement goals and co-design, co-development, and co-delivery approaches (adapted from: IAP2 Spectrum of Public Engagement, UK Climate Resilience Programme knowledge brokering spectrum; Hammill et al. 2013)



Asking the following set of questions is a useful way to help identify what mode(s) of collaboration (if any) is appropriate.

1. What is the goal of the project?

There is not necessarily a single 'right' way of incorporating collaboration; rather the decision to take a co-design, co-development, and/or co-delivery approach depends on the intended engagement and outcome goal of the project

2. Who is being engaged?

Who is the intended beneficiary or end user, who is the client and the key partners? Tailoring engagement activities to those that have a stake is important and considering diversity and inclusion will help make sure all considerations are captured.

3. What engagement mode is most appropriate?

Depending on the intended outcome of the work, a shallow or a deep engagement mode might be most effective. Deep engagement is not always required and takes more time and resource, so it should only be used if appropriate.

4. What are the key roles of scientists and partners, stakeholders?

Is new knowledge being developed? Is the problem still needing to be scoped and understood? Who is driving the project? How will the outcomes be used?

Figure 3. Capability and resourcing requirements for different engagement goals and linked co-design, co-development, and co-delivery approaches

GOAL		Provide access to information	Help make sense of, and use, info	Improve diversity of info/knowledge in decision making	Empower people to drive change and innovate
COLLABORATION MODES	Co-design	x	✓	✓	✓+
	Co-development	x	✓	✓	✓+
	Co-delivery	x	x	✓	✓+
CAPABILITY	Science	• Deep discipline-based expertise (e.g. climate data modelling)	• Translational expertise	• Discipline-based (e.g. social science, climate sciences) and inter-disciplinary expertise	• Transdisciplinary expertise and skills
	Comms	• Development of accessible information outputs	• Development of accessible, practical outputs	• Co-development with others of accessible outputs, use and boundary objects	• Tailoring support to meet aspirations and needs of key partners • Ensure communications outputs are fit-for-purpose for targeted audiences and purposes
	Facilitation & brokering	• Less necessary	• May be required to support problem framing	• Critical (facilitation and brokering skills to enable knowledge integration; collaboration)	• Critical (facilitation and brokering skills to empower others)
	Resourcing	• Internally managed • Set funds • Finite time frame	• Internally managed • Set funds • Time frame can extend (often unfunded)	• Mixed internal and external management • Often staged funding • Extended time frame (funded)	• Externally managed • Multiple sources of funding • Extended time frame, with foresight to identify funds to extend further if needed

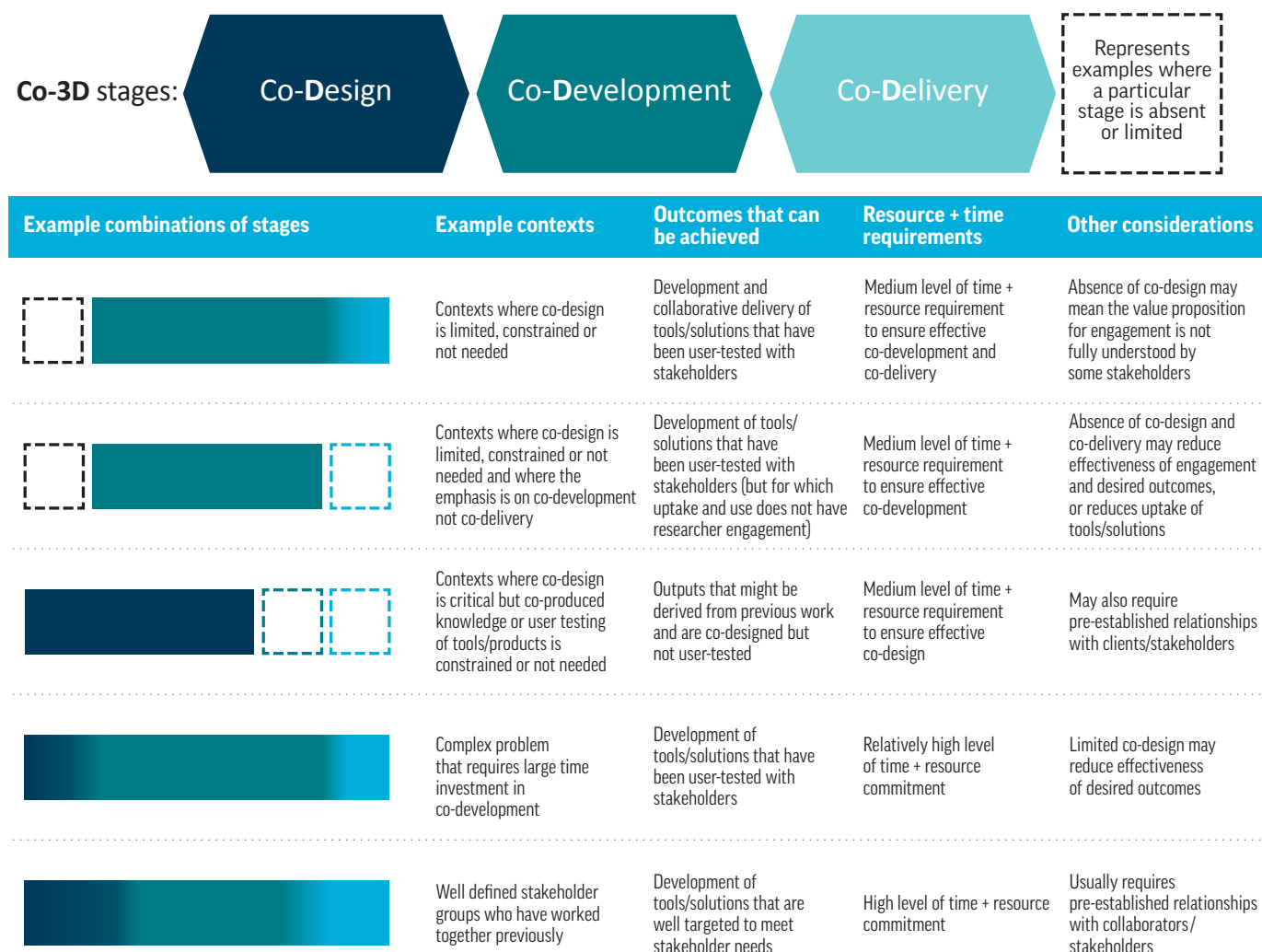
Insights from past and on-going projects in the Climate Science Centre (CSC)

Collaborative research is not new to CSC and CSIRO, more broadly, and past and ongoing projects that have incorporated elements of co-design, co-development and/or co-delivery are useful sources of insights and lessons learned for informing future projects.

Figure 4 captures key findings and insights from interviews and analyses of 5 research projects that involved the CSC (case studies): Climate Services for Agriculture (CSA); Climate Vulnerability and Adaptation Tools for Protected Areas; Climate Projections for the Victorian Department of Environment, Land, Water and Planning (VCP19); Electricity Sector Climate Information (ESCI); and Adaptation of Fisheries Management to Climate Change (for a copy of the report contact us).



Figure 4. Examples of past and on-going CSC projects and combinations of stages for co-design (dark blue), co-development (teal) and co-delivery (light blue) [a = CSA; b = Protected Areas; c = VCP19; d = ESCI; and e = Adaptation of Fisheries Management]



Key insights from these CSC projects were (Figure 4):

- **Co-design, co-development and co-delivery (Co-3D) are typically not distinct but overlapping stages of collaboration.** In any project or body of work, these stages may receive more, or less emphasis, in terms of time, resources and the number of people engaged. For the five projects reviewed, five different combinations of stages were observed. This does not suggest a single 'right' way of combining these stages.
- **Consideration of project goals/outcomes and requirements in advance enables project teams to more intentionally match the design of Co-3D.** Different collaboration approaches have different strengths and weaknesses. Being explicit (and inclusive) about what you are trying to achieve will help decide which approach is best.
- **The longer the time frame involved in Co-3D, the higher levels of resourcing required.** Time and resources are critical for establishing understanding and relationships, and often entails the need to respond to user needs after project timelines have finished, planning and managing longer term expectations are needed.
- **Integrating some form of Co-3D is important.** Embedding some form of collaboration in projects is generally regarded as being important, as without it the project risked being irrelevant. Pursuing 'good' Co-3D processes is critical to achieving longer term outcomes with clients and researchers, where project outputs continue to be used and trusted relationships persist.
- **There are some key skills and mindsets that are fundamental to Co-3D.** These include strong leadership, interpersonal skills, the importance of early and inclusive work to frame the problem, as well as being empathetic, humble and realistic about how climate science fits in with real world decision contexts.

Key points

1. Collaboration is key to impact! But awareness is low

Many research teams may be aiming to work in a co-design-development-delivery method, but they may not have the experience or time. Examples will help guide them in their research approach. There is a lot of confusion about the different terms and how each is best used. This guide can help.

2. No single 'right' way to collaborate

The goal that the project aims to achieve should drive the decision on which modes of collaboration should or need to be integrated into a research project. There is no 'right' way, except what works for stakeholders and the project scope. Being explicit, intentional and inclusive about these decisions is important.

3. Clear expectations

Establish collaboration expectations early and check that they match intended project goals, timeframes and resourcing. Keep checking in as things change over the project duration.

4. Building capacity to integrate collaborative approaches in research is key

Build capacity among climate scientists, and build project teams with diverse and complimentary skill sets.

5. Value and reward critical skills

interpersonal skills will be required to work in a Co-3D manner as there is significant listening, knowledge sharing, and facilitated thinking that will occur across the teams. Negotiation of client needs and realistic outputs will also have to be frequently discussed. Reflexivity, patience and humility are all valuable skills for Co-3D.

6. Take a longer term view

Collaboration takes time and requires relationship building, mutual learning and listening. Time requirements should be factored into projects and expectations about how outcomes will be maintained after projects end need to be explicitly addressed.



Further reading

There are many resources to support co-design, co-development and co-delivery. Here are some to explore:

1. IAP2 spectrum <https://iap2.org.au/resources/spectrum/>
2. The Ladder-of-coproduction. www.thinklocalactpersonal.org.uk/_assets/COPRODUCTION/Ladder-of-coproduction.pdf
3. Chambers et al. 2021, *Six modes of co-production for sustainability* | Nature Sustainability
4. Ten principles for good co-production
A manual for co-production in African weather and climate services: Home <https://futureclimateafrica.org/coproduction-manual/>
5. Knowledge broker spectrum <https://research.csiro.au/integration/knowledge-brokering/>

Acknowledgement/contact:

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Click the link to find out more
<https://go.csiro.au/FwLink/co3D>



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