

Knowledge Broker Support Program

Volume 1 - Foundation - Reflective practices and knowledge brokers as change agents module

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Cover photo: Knowledge broker in action. Photo by Tom Greenwood, 2017. Photo below by Tom Greenwood.



Reflective practices and knowledge brokers as change agents

In this module, you will learn about the characteristics and competencies of change agents in adaptation interventions. The focus is on reflecting on ourselves and learning to be better knowledge brokers who can cultivate change in your projects and communities.

What you learn in this module will be used in other modules and will also be useful for engaging with others and influencing them to change.

At the end of this module, you will be able to:

- 1 Reflect on how change happens and your role in it.**
- 2 Identify and reflect upon the competencies and characteristics that knowledge brokers need.**
- 3 Understand the different competencies needed to facilitate adaptation decision-making.**
- 4 Reflect on your role as a change agent by being a knowledge broker.**

Why are we doing this?

Self-reflection is the key to self-awareness.

Self-reflection is an important and sometimes difficult aspect of learning and growth, whether change is planned, or unplanned and unexpected.

In its simplest form self-reflection allows a person to examine what is working and what is not, and how they could improve in the future.

**“Between stimulus and response there is a space.
In that space is our power to choose our response.
In our response lies our growth and our freedom.”**

— Quote attributed to Viktor Frankl by Stephen R. Covey.

The ‘space’ in the above quote is an opportunity to critically self-reflect and make a choice in how to respond, rather than to react.

Pausing is hard and requires constant practice especially when you are under pressure or are emotionally triggered.

What sets stronger change agents apart are their self-reflection practices, re-thinking their goals and approaches, as well as their interest in further developing their competencies including interpersonal skills, strategic planning, and their systems perspectives. This closely aligns to the multiple types of learning needed for adaptation.

What does a knowledge broker look like?



Figure 11 Vision of a knowledge broker. Design by Zelda Hilly, Michaela Cosijn and Samara Cosijn. Artwork by Samara Cosijn

Characteristics and competencies

Characteristics are the qualities or attributes of a person, such as their values and purpose, relationships and networks, and interest in learning or mastery and creativity.

Competencies are how a person combines their skills and resources into their 'know how' or expertise.

Together, characteristics and competencies are like two wheels of a bicycle that help propel you further and faster on your journey.

Characteristics and competencies are changeable and can be strengthened, and like bicycle riding the more you practice the more proficient you get.

How to grow your competencies and influence your characteristics?

If an individual or group wants to do something, they need the skills to do it. Like baking a cake, they need to know the mechanics of how to mix butter and sugar.

A person making a cake also needs to have the capacity to cook, which might involve the ability to read a recipe and be able to understand and implement the steps.

In addition to the skills and capacity, a person needs the capability to bake a cake. This capability includes having access to ingredients, appropriate tools, such as an oven, and the time to make the cake.

If a person wants to get good at baking, they will need to value learning the skills and develop the appropriate behaviours and attitudes in order to practice. This practice is also true for everything else we do.

The combination of a person's capability and values, behaviour and attitude all contribute to the level of a person's competence — in this case, the quality and consistency of their cakes!

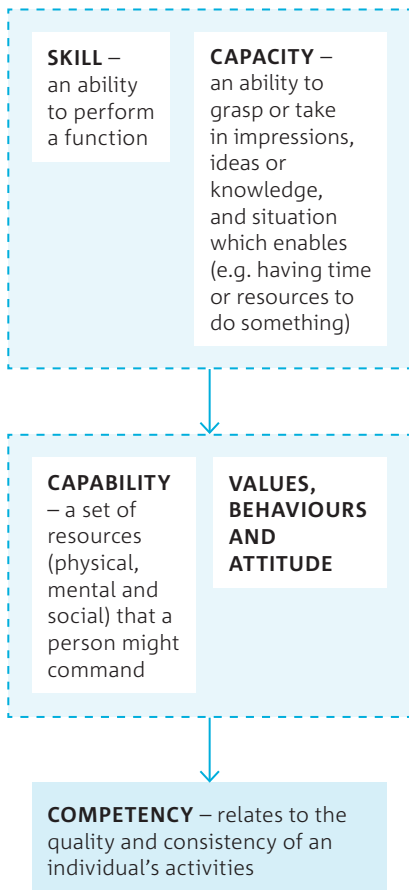


Figure 12 Capacities, capabilities and competencies

Capacities are one's ability to perform a task, learn and develop, and generate an outcome, while **capabilities** are a set of resources that are physical, mental, and social that a person might command, which give rise to various 'functionings' – the things a person values doing or being.

If **skills** are tools for change, then **competencies** can be thought of as combining skills with abilities and behaviours to create a certain 'know-how' or practice.

It is important to note that an individual's capacity and associated capability is tied to:

- their individual and social context,
- their history and culture,
- often their gender, age and socio-economic status.

An individual will have more or less capacity depending on their ability to access formal and informal knowledge, education and training. Through your activities and projects as a **knowledge broker you can help people grow their capacity, capabilities and competencies.**

No one is born fully-formed: it is through self-experience in the world that we become what we are.

— Paulo Freire

What characteristics and competencies are useful for a knowledge broker?

Rapidly changing global and local contexts will require thinking differently about designing and implementing adaptation activities and projects. Different situations and problems will require different skills and competencies in knowledge brokers seeking to be change agents.

While skills are important for activities and projects, they can be highly specific to the task at hand. By focusing on developing your competencies for adaptation and sustainability interventions, you and your stakeholders will be better able to deal with different contexts and situations, and develop the specific skills you need.

Over time you and your stakeholders will grow stronger knowledge broker characteristics, which in turn will help further strengthen your competencies.

Four characteristics and three competency themes are important for knowledge brokers seeking to enable change (Meharg, 2020).

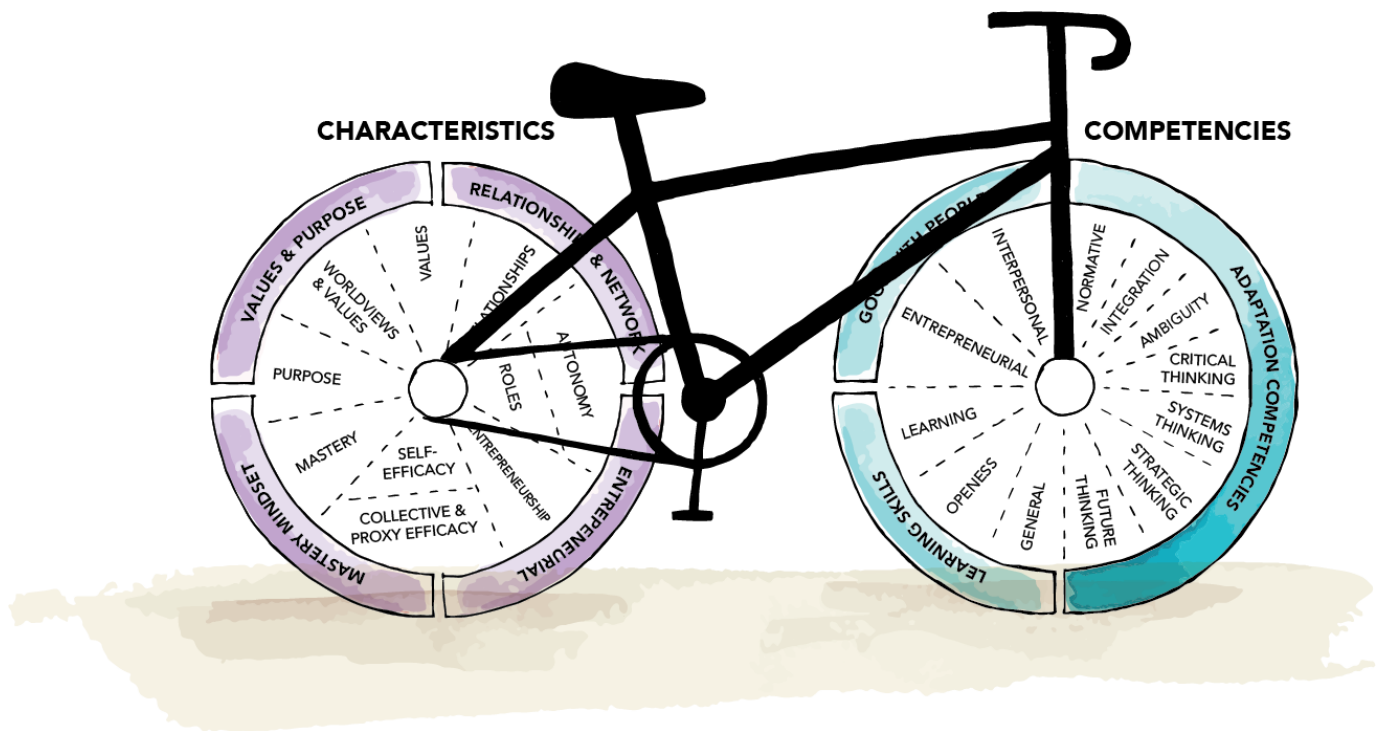


Figure 13 The connection between characteristics and competencies. Source: Meharg, S. 2020. Artwork by Dr Manuela Taboada, Queensland University of Technology

REFLECTION OPPORTUNITY
- what are your core values?

**“Those who have a
‘why’ to live can bear
with almost any ‘how’.”**
— Victor Franklin
Man’s Search for Meaning (1946)

Capabilities and competencies are intertwined

These characteristics and competencies are useful in all contexts. The adaptation competencies become more important when undertaking climate change and climate adaptation activities and projects.

This module focuses on values and purpose, being good with people, learning and mastery, entrepreneurial spirit, and adaptability, which are core for knowledge brokers mainstreaming climate change to develop.

Values and Purpose

VALUES

Values, beliefs and attitudes go part way to explaining an individual’s behaviour and guiding their actions.

You are influenced by your context and in turn, you help shape this context often through social comparison and norms.

Schwartz (2012) suggests that there are ten basic personal values that are clustered into four higher-order values:

1. Openness to change (self-direction and stimulation)
2. Self-enhancement (power and achievement)
3. Conservation (security, conformity and tradition)
4. Self-transcendence (overcoming of individual limits to have concern for the welfare of others)

Importantly, some values are better predictors of success for adaptation and development interventions, such as openness to change and self-transcendence.

Research has shown that a high degree of threat or risk does not change behaviour (Thaker et al. 2016). Therefore, cultivating desired values and traits in others is an important aspect for adaptation intervention teams to consider.

PURPOSE

Purpose is the reason why something is done, an intention or objective.

Purpose is someone’s “why”.

While there is no right or single pathway, historical case studies demonstrate that when systemic change happens, it is often because of an individual, or group of people, have a shared purpose and worked through multiple pathways to achieve their goal.

Purpose provides motivation to act and to keep going when someone faces difficulties or barriers.

Values and purpose connect closely to the ‘normative’ adaptation competency (values, principles and goals of individuals and groups).

Relationships and networks

Developing strong relationships and networks is important as a knowledge broker to understand others, learn from them, influence them and support change.

Building strong relationships where people trust you is crucial to developing a network of people who can enact change. It is also important to develop a diversity of relationships with a wide variety of people as a knowledge broker, so that you can action multiple pathways towards your goals and bring your community with you.

Being good with people

Knowledge brokers need to be good with people. The Pacific way also honours people and places, and embodies relationships and values.

Knowledge brokers require social skills that enable connection to others, team work, trust building, network creation and maintenance, two-way communication, emotional intelligence, empathy, social learning, motivation, etc.

It encapsulates the African concept of

“Ubuntu”: I am only because you are.

Ubuntu is similar to the Pacific Way, which is about how we all live together, listen deeply and treat ourselves and other people and the environment and how we work together for the common good in a chaotic, rapidly changing world.

Be empathetic and put yourself in the shoes of others, and acknowledge the reality of the situation no matter how painful.

Communicate effectively, as poor communication often damages or destroys relationships. Be open and communicate clearly at the level of the people you are engaging with and in a way that is relevant to them. Try to be clear about your own assumptions and biases, and clarify what people say. Knowledge brokers can often communicate in multiple languages to bridge the communication gap between people.

Be open about how you feel and show you care about people.

Be inclusive in who you engage with and how you talk to people (everyone should have a valid voice). Consider including those who often struggle to have a voice, such as women, people with a disability and youth.



Good relationships and networks require care and connection, much like weaving

“What if we assumed that learning is as much a part of our human nature as is eating and sleeping, that it is both life-sustaining and inevitable? And what if, in addition, we assumed that learning is a fundamentally social phenomenon, reflecting our own deeply social nature as human beings capable of knowing?”

— ETIENNE WENGER

Mastery mindset, efficacy and learning skills

Learning and having a learning mindset is critical for adaptation as it is an entry point for change and innovation, creating a sense of possibility, motivation and resilience. Everyone needs to learn actively.

Educational theorist and practitioner Etienne Wenger strongly believes that learning is not only essential for humans, but it is also more effective when done socially and in a situated, contextualised manner.

Reflection and Reflexivity

Reflective practice is the capacity to actively reflect on what you have done/ what others are doing and to develop insights and lessons. Reflective practice is part of continuous learning and draws heavily on the **first two learning loops**.

Reflexivity draws on the **third learning loop**, developing strategies to query our values, assumptions, thought processes and attitudes to question what is right and what is possible, noting that we are all shaped by our culture, environment and situations.



There are three loops of learning or questions you need to ask yourself and your team when designing projects and undertaking activities.

FIRST LOOP

Are we doing things right? Learning is normally easy to do, requires redoing what has been done before and has low risk of failure. Only incremental change is required. This type of learning is appropriate for clear problems —such as baking a cake or learning to recycle your waste.

SECOND LOOP

Are we doing the right things? It is about understanding causality and improving what is already working. There are potentially many risks that need to be managed. Change requires reframing, reorganizing, adding or detracting. Second loop questions are important for complicated problems, such as launching a boat in rough weather or choosing who could participate in a workshop.

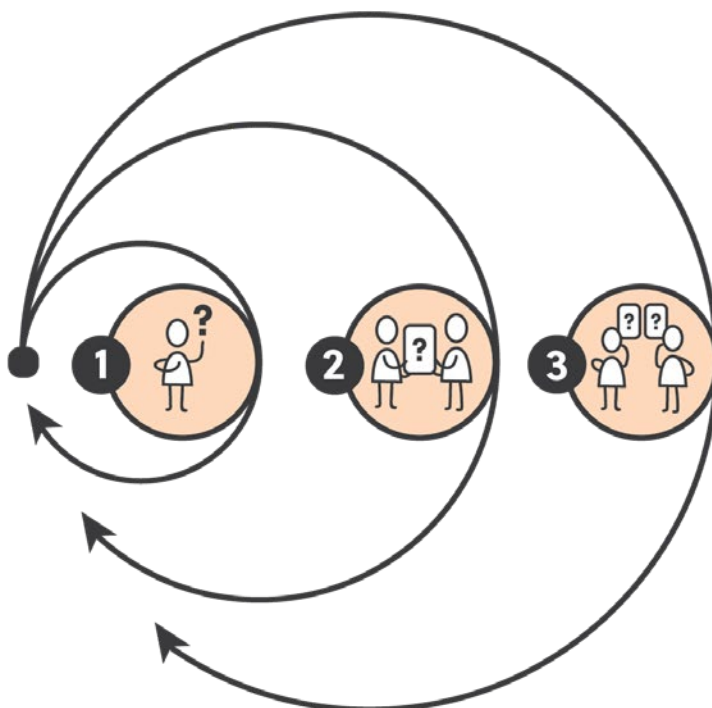
THIRD LOOP

How do we decide what is right? It is about understanding how the system works and how decisions get made based on values and norms. It then requires reflection on how to create transformational change through re-invention, innovation and creating something new.

The third learning loop is needed for complex issues where it is unclear what the correct pathway of action is and what success looks like. Building relationships with all stakeholders is crucial.

An example is bringing up a child, “it takes a whole village” to do it well.

In most projects all three learning loops are required.



MULTI-LOOP LEARNING

- 1 Are we doing things right?
- 2 Are we doing the right things?
- 3 How do we decide what is right?

Figure 14 Triple Loop Diagram source and more information on multiple- or triple- loop learning and how it can be integrated with adaptation thinking can be found in: Australian Government, Department of Home Affairs. 2019. Climate and Disaster Risk: What they are, why they matter and how to consider them in decision making. 3 Guidance on Vulnerability. CC-BY-4.0

**Efficacy is defined as
“the ability to produce a
desired or intended result.”**
(Oxford English Dictionary)

Mastery

Mastery is about the focus on self-development through lifelong learning and practice.

Mastery is an iterative process that requires persistence and determination. Mastery is goal-directed and a purposeful practice, building on existing knowledge. It requires failure, problem solving, making use of patterns, and adjusting to changing contexts (Lawley and Tompkins, 2008).

Mastery can be applied to many aspects of people’s lives; however, mastery associated with sustainability or public good centres on ‘taking responsibility’ and ‘enabling’ others and changes in the system. Serman (2002) suggests that mastery requires humility about the limitations of knowledge, personal views and decisions, while having the courage and openness to learn ‘though all our maps are wrong’.

Efficacy

Efficacy beliefs influence what action people choose to pursue, the goals they set and their commitment to them in spite of obstacles in their way (Bandura, 2006).

Having a stronger sense of **self-efficacy** will lead to greater perseverance and an increased likelihood of success.

A strong sense of collective efficacy in a community will encourage participation in activities. **Collective efficacy** is significantly and positively associated with community adaptation responses, with prosocial orientation characterised by cooperativeness, helpfulness and sharing.

Proxy efficacy is the ability to influence through others, such as engaging with your local church or politician.

An example of **self-efficacy** is learning how to fish sustainably. **Collective efficacy** would be needed for a community to manage a shared reef sustainably. Community members could use **proxy efficacy** to influence their local government to protect the reef with new rules or resources.



If you would like to know how your to-do list can help in developing your own self efficacy and learning watch this Ted Talk video:

How your to-do list shapes your personality — and how to use it to remake who you are, by Brian R. Little <https://ideas.ted.com/how-our-projects-shape-our-personalities-and-how-we-can-use-them-to-remake-who-we-are/>



GROWING YOUR EFFICIENCY THROUGH MASTERY

An example of cultivating efficacy is how Roger Bannister managed to break the 4 minute mile in 1954.

Prior to Roger breaking the four-minute mile people thought it was physically impossible for a human to run that fast.

Roger and his coaches solved the “brain barrier” by having other runners do short sections of the mile tack with him at faster speed (pacing him) so he thought that he was ‘keeping up’ with them. This allowed him to fool his brain into keeping his body moving at the necessary speed to break the time barrier.

Within 46 days, Bannister’s rival, John Landy, ran a four-minute mile and broke the record with a time of 3 minutes 57.9 seconds. A year later, three runners ran four-minute miles in a single race. By the end of 1978, over 200 runners had broken the once impossible barrier of the four-minute mile.

“Do not go where
the path may lead,
go instead where
there is no path
and leave a trail.”

— Ralph Waldo Emerson

Creativity and entrepreneurial skills

Knowledge brokers are entrepreneurial. They are proactive, looking for opportunities and not waiting for the change to happen. They create change within their networks and environments.

It is hard to walk that hasn't been cut, but you can provide a trail for others to follow. Creativity requires critical thinking, innovation, being adaptable, taking opportunities that arise, and continual learning and improving who they are and what they do. It also requires thinking outside the box.

Adaptation competencies

In addition to a wide range of skills, there are seven core competencies associated with knowledge brokering for climate adaptation:

1. **Future thinking:** Anticipatory skills which help people think about the future and make practical judgements.
2. **Integration:** Thinking differently, with the capacity to cope with nonlinearities, having a decent understanding of several disciplines and accommodating the belief and knowledge of others.
3. **Ambiguity:** Able to sit with the discomfort of not knowing and encourage others to do the same.
4. **Critical thinking:** reasoning skills, flexible thinking and the capacity to shift from one perspective to another.
5. **Systems thinking:** Understanding connections, feedback loops, drivers and scenarios of change.
6. **Strategic thinking:** Planning and self-regulation skills. It is identifying and then actioning steps to implement, including addressing any barriers.
7. **Normative:** The values, principles and goals of individuals and groups, such as having concern for others and thinking socially.

Like the other competencies, you don't have to have all of these seven competencies. Rather, you need to ensure that you can access them through your team members or consultants.

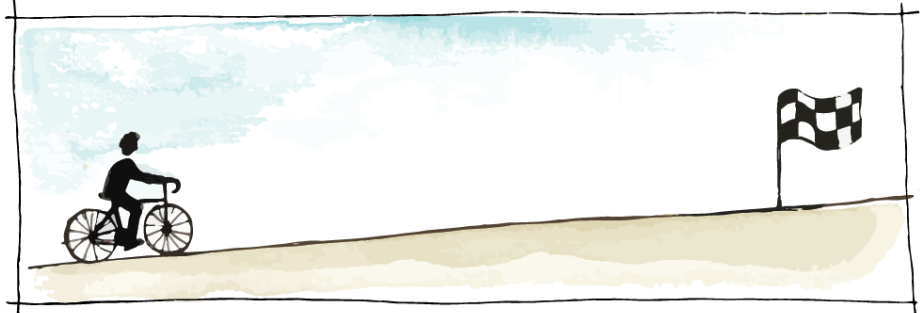
COMPETENCIES OF THE FUTURE

This list of competencies is not static and will continue to evolve as new competencies become essential for creating change.

For example, digital and technological competencies – e.g. the ability to engage with technology and understand and assess the credibility of information will become increasingly vital.

The art of adapting

YOUR PLAN



REALITY

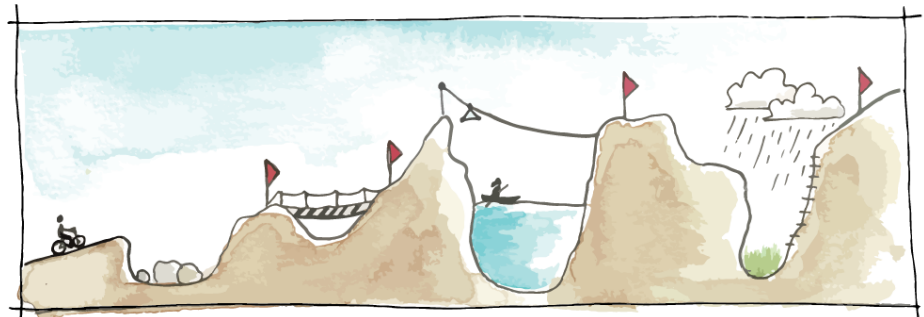


Figure 15 Your plan v reality.
Source: Doghousediaries comic
Redrawn by Dr Manuela Taboada,
Queensland University of Technology

You are a change agent with a vision or goal [future thinking competency] of the change you want to achieve. You developed this vision with the community you are working with and your funder [interpersonal competency].

Creating this shared vision requires you to actively listen and gain a good understanding of the values, principles and goals of your community and funder [openness competency]. You will also need to:

- understand the context you are operating in [systems competency]
- be able to use your communication and influence skills [entrepreneurial competencies]
- facilitate a discussion, co-creating the shared vision [normative competency]
- develop an initial plan that will take you towards the goal by combining everyone's knowledge of the situation [strategic and integration competencies].

So far, the path looks straight and clear, so you jump on your bicycle and set off. Before long you realise the path isn't as clear as you thought, it is complicated and there are obstacles that you have to address such as the rocks and bridges. However, you are able to learn from what is happening [learning competency] and are flexible in your journey so that you adjust your plan to an alternative pathway [critical thinking competency] to achieve your goal.

Before long you notice a lake that your bicycle can't cross, so you sit with the ambiguity of not knowing how to cross this new complexity until you reach the lake. When you reach the lake, through discussion with others and your openness to new ideas and creativity enables you all to rebuild an old boat with your bicycle acting as an engine [integration] to cross the lake.

While the journey is long and often tiring, you know that by maintaining and cultivating the characteristics and competencies you need in yourself and with others, jointly you will be able to achieve your goals.

Want more?

Further ideas can be found at:

WEADAPT

www.weadapt.org/knowledge-base/climate-knowledge-brokers

SPREP, including the March 2021 article on scaling up knowledge brokering

www.sprep.org

Pacific Climate Change Science

www.pacificclimatechange.science.org

Connecting competencies to adaptation decisions

Knowledge broker competencies are the know-how that enables adaptation decisions. The degree to which each competency is necessary differs along parts of the knowledge brokering spectrum.

General and interpersonal skills are vital across the knowledge-brokering spectrum. Once you get into knowledge brokering in complicated systems, all of the competencies become increasingly valuable and needed.

You personally don't need to have all these competencies, but you have to be willing to work with others who do.

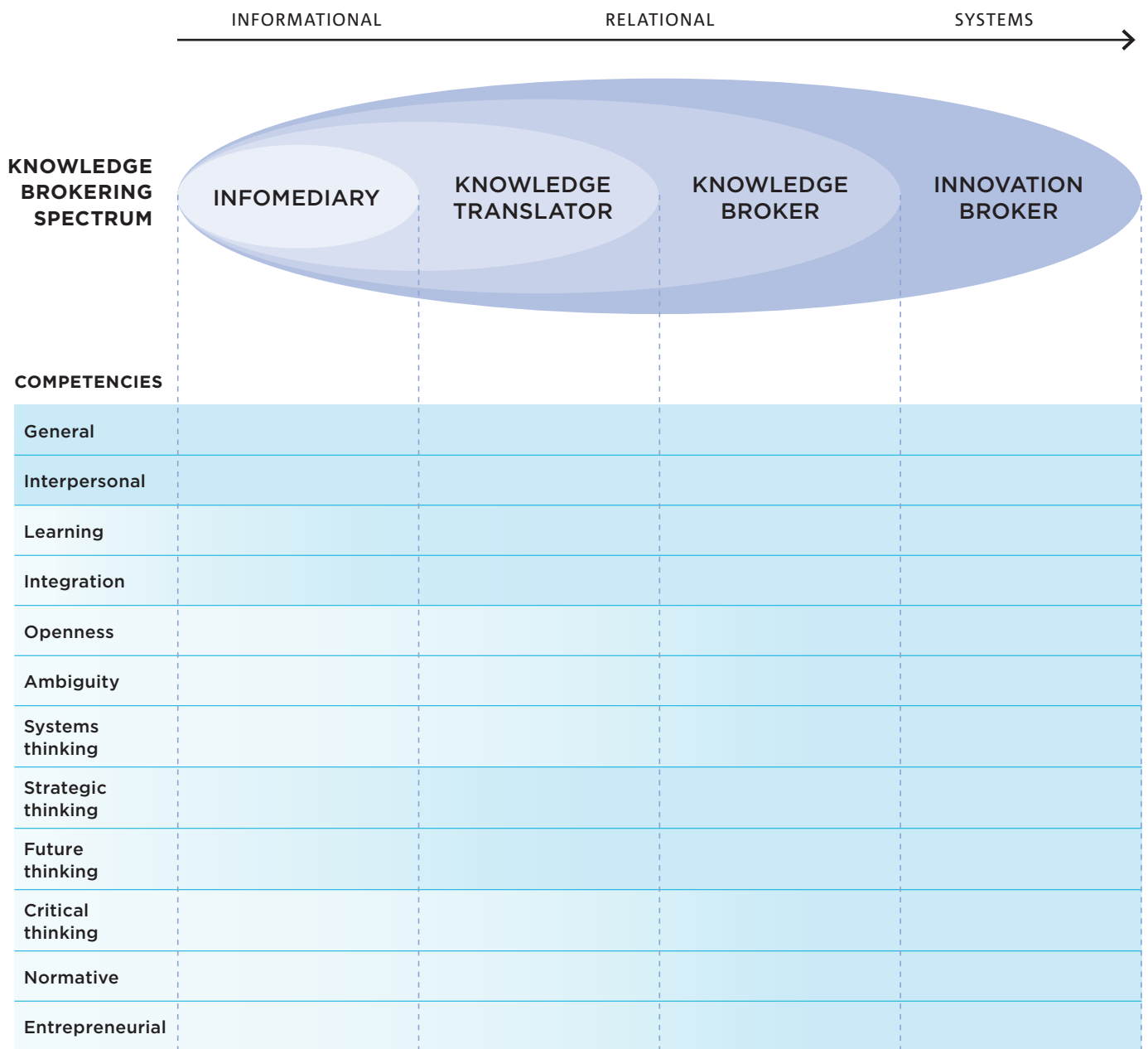


Figure 16 Competencies by knowledge broker type. Adapted from Harvey et al 2012 and Meharg, 2020.

General	General competencies include but are not limited to, being able to read, write and operate standard software, such as email, word and excel. English language skills to be able to access information and engage with international partners and donors. Project planning and management skills, risk management skills and business development skills
Interpersonal	The social skills that enable connection to others, build trust and social networks, to understand and work effectively with others.
Learning	Learning orientation and having the skills to do so, including social learning, critical reflection and reflexivity.
Integration	Thinking differently, with the capacity to cope with nonlinearities, have a decent understanding or several disciplines and accommodating the belief and knowledge of others.
Openness	Includes the cultivation of an open mind and being open to new or different world views, values, ideas, and processes, enabling brokers to see opportunities that others do not.
Ambiguity	Being able to sit with the discomfort of not knowing and being able to help others do the same.
Systems thinking	Understanding connections, feedback loops, drivers and scenarios of change enables agents to understand better the context they are operating in, see the connections between things, and identify intervention points.
Strategic thinking	Planning and self-regulation skills. Identifying and then actioning steps to implement, including addressing any barriers.
Future thinking	Anticipatory skills help people think about the future and make practical judgements.
Critical thinking	Critical thinking skills include reasoning skills, flexible thinking and the capacity to shift from one perspective to another.
Normative	The values, principles and goals of individuals and groups, such as having concern for others, thinkingsocially or environmentally. To enable social change, an agent first needs to be aware of their own norms and values.
Entrepreneurial	Thinking outside the box, communication and influencing skills, including the ability to engage with politics and understand the institutions that support innovation.

Competencies by knowledge broker type

As you move across the spectrum of brokers from Infomediary to Innovation brokers you need a greater number and depth to your skills and competencies, as well as access to a greater number of competencies through others to address challenges.

COMPETENCY & DEFINITION	INFOMEDIARY	KNOWLEDGE BROKER	INNOVATION BROKER
<p>General</p> <p>General competencies include but are not limited to being able to read, write and operate standard software, such as email, word and excel. English language skills to be able to access information and engage with international partners and donors. Project planning and management skills, risk management skills and business development skills.</p>	<p>General competencies are vital skills for all types of brokers, although some competencies, such as project planning and risk management skills, you can access through others if you do not have the time or skills yourself. These competencies will need to be more developed as you start to engage with complex and complex problems.</p>		
<p>Interpersonal</p> <p>The social skills that enable connection to others, build trust and social networks, to understand and work effectively with others.</p>	<p>Interpersonal competencies are perhaps the most important competency for all types of brokers.</p>		
	<p>For an infomediary, these competencies will be vital for building trust and working with others so that the information they are providing is considered and used by stakeholders. Critically this is not a competency that can be outsourced. It is a valuable competency to cultivate in your team and stakeholders.</p>	<p>Knowledge brokers will need to have well-developed interpersonal skills to connect to and create networks for sourcing information and enabling change.</p>	<p>Innovation brokers will have significant interpersonal expertise allowing them to work across multiple networks of different types and levels, building trusted collations for change.</p>
<p>Learning</p> <p>Learning orientation and having the skills to do so, including social learning, critical reflection and reflexivity</p>	<p>Solutions are discovered through individual and collective learning, and often the solution itself will involve ongoing adaptive learning (see Triple Loop Learning in Module on Monitoring Evaluation and Learning).</p>		<p>A key growth area for knowledge and innovation brokers is this awareness that there are no easy or obvious answers to complicated problems. As a knowledge broker in complicated systems, it can be helpful to operate within the second learning loop: “Are we asking the right questions”, with innovation brokers also exploring “How do we decide what the right questions are?”.</p>
<p>Integration</p> <p>Thinking differently, with the capacity to cope with nonlinearities, having a decent understanding of several disciplines and accommodating the belief and knowledge of others</p>	<p>For infomediaries, this will include searching for and combining or collating different types of knowledge and communicating it in an accessible and useful way for others, for example, integrating climate information and crop data for agriculture departments.</p>	<p>Knowledge brokering is all about learning from different knowledge systems, perspectives, and cultures and weaving them together in helpful ways.</p>	<p>Innovation brokers will require further developed integration competencies to incorporate the many different knowledge types and perspectives to understand and address challenges in a complex system.</p>

COMPETENCY & DEFINITION	INFOMEDIARY	KNOWLEDGE BROKER	INNOVATION BROKER
<p>Openness</p> <p>Includes the cultivation of an open mind and being open to new or different world views, values, ideas, and processes, enabling brokers to see opportunities that others do not.</p>	<p>Being open to new ways of doing is a precursor for deeper learning and is linked to creativity. Being willing to listen, observe and change, rather than sticking to what you know and what has worked in the past.</p>		<p>For innovation brokers who need to help stakeholders develop creative solutions to complex problems, developing their openness competencies will be strongly connected to the 2nd and 3rd learning loops.</p>
<p>Ambiguity</p> <p>Being able to sit with the discomfort of not knowing and being able to help others do the same.</p>	<p>Cultivating the ability to engage with ambiguity is an important competency for all of us as the world becomes more complex. For an infomediary, this may include helping stakeholders understand the uncertainty and limitations of climate projections.</p>	<p>Complicated systems involving multiple knowledge systems and values can feature deeper kinds of ambiguity. For example, values can be very private and not readily discussed in public settings, particularly for people who feel marginalised. Pathways towards solving a problem can also be ambiguous, especially if different knowledge and value systems imply different priorities for action. More generally, complicated systems have many interacting components that can be difficult to identify and understand.</p>	<p>Complex systems involving multiple knowledge systems and values feature deeper kinds of ambiguity. There are many interacting components that can be difficult to identify and understand. Data is often also ambiguous. You, your team and the people you work with need to be able to navigate ambiguity.</p>
<p>Systems Thinking</p> <p>Understanding connections, feedback loops, drivers and scenarios of change enables agents to understand better the context they are operating in, see the connections between things, and identify intervention points.</p>	<p>Infomediaries often work in contexts that have clear causes and effects. Systems thinking is still useful in this context to ensure the questions and answers fit within the broader socio-political context. Systems thinking competencies are useful to learn, but can also be outsourced with insights incorporated into your planning and implementation.</p>	<p>Systems thinking is needed in complicated systems because these systems often require understanding different kinds of system interactions. For example, there can be interactions between different sectors (e.g. impacts of land-use change on water quality, or the influence of economic policies and incentives on resource exploitation patterns), different geographic locations (e.g. downstream impacts of upstream water resource development), different temporal scales (e.g. decisions now that will lock in consequences for coming decades), and between different knowledge or value systems (e.g. individual interests in conflict with collective interests).</p>	<p>Systems thinking is needed in complex systems because different kinds of systems interact. You need to understand the context. For example, there can be interactions between different sectors (e.g. impacts of land use change on water quality, or the influence of economic policies and incentives on resource exploitation patterns), different geographic locations (e.g. downstream impacts of upstream water resource development), different temporal scales (e.g. decisions now that will lock in consequences for coming decades), and between different knowledge or value systems (e.g. individual interests in conflict with collective interests). These effects are even more pronounced in complex systems.</p>

COMPETENCY & DEFINITION	INFOMEDIARY	KNOWLEDGE BROKER	INNOVATION BROKER
<p>Strategic Thinking</p> <p>Planning and self-regulation skills. Identifying and then actioning steps to implement, including addressing any barriers</p>	<p>Planning and ensuring you have a clear understanding of what your goals are, who is doing what and when they are doing it is important. Working with different people in different roles and organisations involves a lot of communication, consulting, and awareness of and compliance with local rules and regulations. These will become more complicated as you move into complicated and complex systems. Strategic thinking is closely linked to learning to ensure you still meet your goals.</p>		<p>As you will aim to change how the system operates, you must have strategic thinking or access to well-developed strategic thinking. Thinking strategically may require thinking many steps ahead of where you are now and engaging with a diverse set of stakeholders in anticipation of being able to enact future decisions.</p>
<p>Future Thinking</p> <p>Anticipatory skills help people think about the future and make practical judgements</p>	<p>If you are asking people to imagine a fundamentally different future, how do you help people imagine possible impacts on the things they care about? Future change may be incremental (in a clear system), involve larger structural change (complicated system) or fundamental transformation (in complex systems).</p>		
<p>Critical Thinking</p> <p>Critical thinking skills include reasoning skills, flexible thinking and the capacity to shift from one perspective to another</p>	<p>Can you critique the information and knowledge you are hearing or seeing, make sense of it, and identify gaps or different ways of understanding the problem? Critiquing information becomes harder as you move into complicated and complex systems where multiple knowledges, information sources and values need to be integrated.</p>		
<p>Normative</p> <p>The values, principles and goals of individuals and groups, such as having concern for others and thinking socially or environmentally. To enable social change, an agent first needs to be aware of their own norms and values</p>	<p>Normative awareness (of yourself and others) becomes important when different values exist among all people involved. Normative competencies are difficult to outsource, although if your team has a high level of trust and good communication, it is possible to share your collective insights.</p>	<p>Part of knowledge brokering is about surfacing everyone's values and objectives (including your own). Different knowledge systems and values interpret the same events and information differently and have different beliefs about what should be done, even if shared goals exist. Negotiating these can be challenging as there is not always a clear right or wrong.</p>	
<p>Entrepreneurial (creative thinking)</p> <p>Thinking outside the box, communication and influencing skills, including engaging with politics and understanding the institutions that support innovation.</p>	<p>Entrepreneurial competencies may not be required for infomediaries who are engaging in knowledge transfer; however, they can still be valuable</p>	<p>Being entrepreneurial involves thinking outside the box and creating things we have never seen before, imagining very different outcomes and making them possible. This competency is a vital aspect of the innovation broker team. For knowledge brokers, you want to be able to spot when this is needed (and work with creatives who can help spark that).</p>	



What do infomediaries do?

Good general and interpersonal competencies will be sufficient for acquiring and collating information. However, to translate information into the problem context, even at this most straightforward end of the spectrum, it is helpful to have developed many of these other competencies.

The infomediary role is not simple, even when making “simple/clear” decisions. It is not one-way communication. It involves careful listening and awareness of what perspectives and knowledge are being excluded (e.g. specialist knowledge on climate and crop physiology may be included, but knowledge of the social and political dynamics of the agricultural system excluded). It’s helpful to involve different people who bring diverse knowledge and experience.

The figure below shows some of the roles and steps an infomediary usually needs to take when navigating a complex problem.

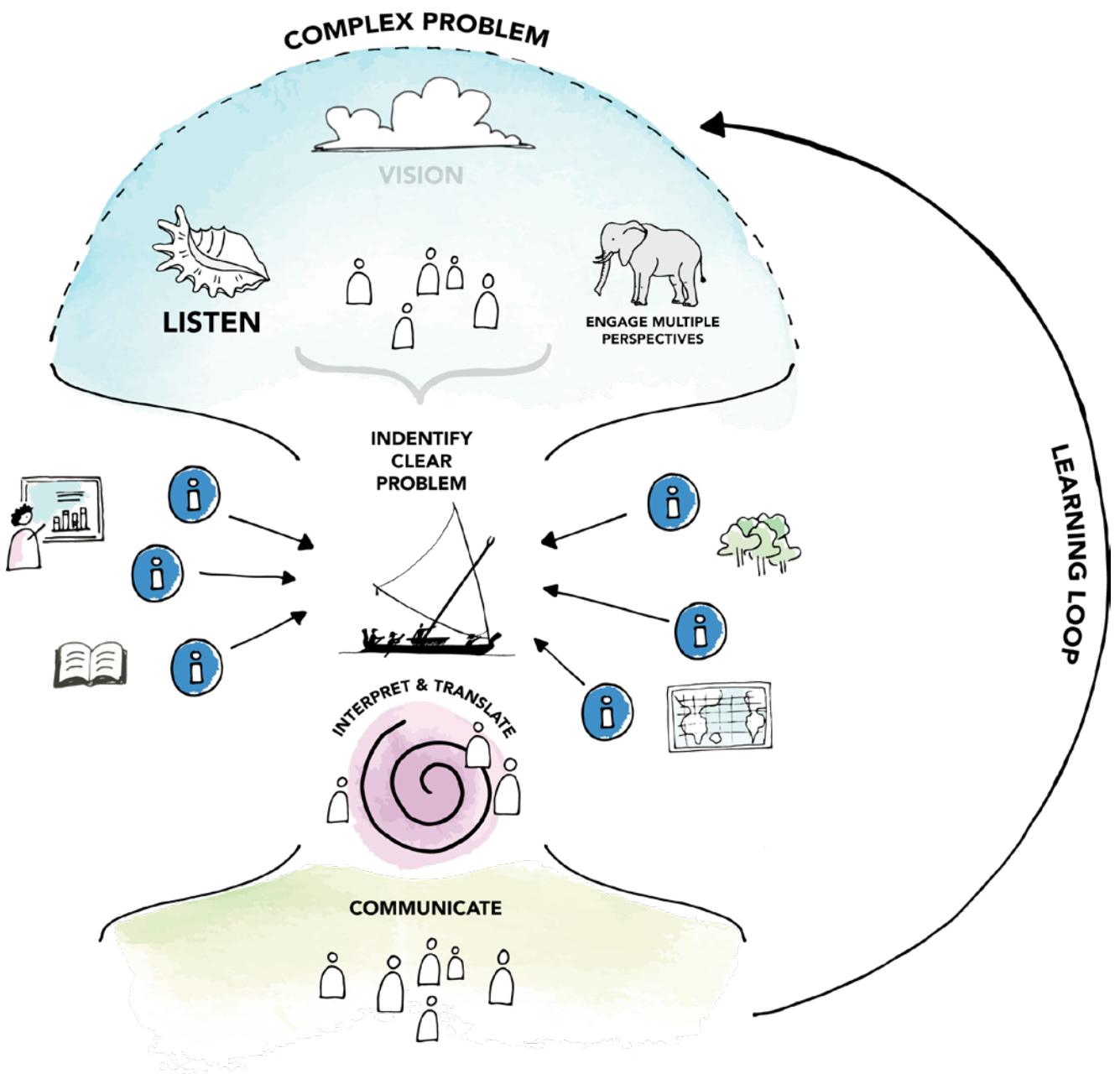


Figure 17 What infomediaries do. Diagram design by the CSIRO team. Artwork by Dr Manuela Taboada, Queensland University of Technology

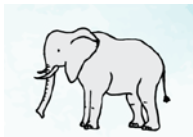


Listen and identify information needs

Infomediaries working in complex space help others navigate [**boat**] the problems and opportunities. This requires that they listen [**shell**] to stakeholders/clients/funders/beneficiaries about their problem description and identify **clear** problems and information needs (usually within a more complex context).



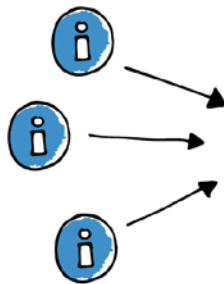
First and foremost, we cannot emphasise enough how important it is to listen to people about what they think the problem is. Different people can have different ideas about the problem [**elephant**] and what is needed to address it. It is worth taking time to foster listening between people to develop a shared understanding of some clear questions and the kind of information needed to answer those questions in a useful way.



There will be times when this is not possible, which is a sign that it is a more complicated or complex system.

Search and collate information

An infomediary then searches for and collates available information [**information icon**]. At this point, you are not expected to have all the information at your fingertips, which will involve those general and interpersonal skills as you seek out appropriate sources of knowledge and expertise.



For example, it may involve talking with weather experts in your local bureau of meteorology, asking for health or crop data from government departments or speaking with locals to learn about the impacts of extreme weather events. You may need to bring together different people who bring different skills into analysing and interpreting the information.

Interpret and translate

You may find yourself as a bridge between people who are providing information and people who are trying to make sense of that information in ways that are useful to them [**swirl**].



You may need to work with many people to make sense of the information coming to you. Don't expect to do everything by yourself, and be sure that every project will be very different and present unexpected challenges.

Learn

As an infomediary, it is also important to check whether the information and knowledge you provide are being understood correctly and useful for addressing the problem. Remember the importance of operating within the three learning loops.



Communicate

Collating and interpreting the information is only useful if you can communicate in a way that is accessible and useful for others. This process requires careful listening and learning as you try different ways of communicating the information.

This communication stage is also important for communicating any limitations or assumptions made in gathering or analysing the information in the first place. For example, in your clear problem, you may assume that temperature changes are more important than other climate change drivers, such as rainfall changes or extreme events.

What do knowledge brokers do?

More than knowledge translation, knowledge brokers co-produce knowledge with decision-makers and those affected by decisions. This process requires knowledge brokers to have access to a whole spectrum of broader and deeper competencies than those developed by an infomediary.

For example, it may be sufficient for an infomediary to have average interpersonal skills and be open to learning. But a knowledge broker needs to have strong interpersonal skills and normative competencies and be able to engage with ambiguity.

Co-production is defined by Norström et al (2020) as:
“Iterative and collaborative processes involving diverse types of expertise, knowledge and actors to produce context-specific knowledge and pathways towards a sustainable future.”

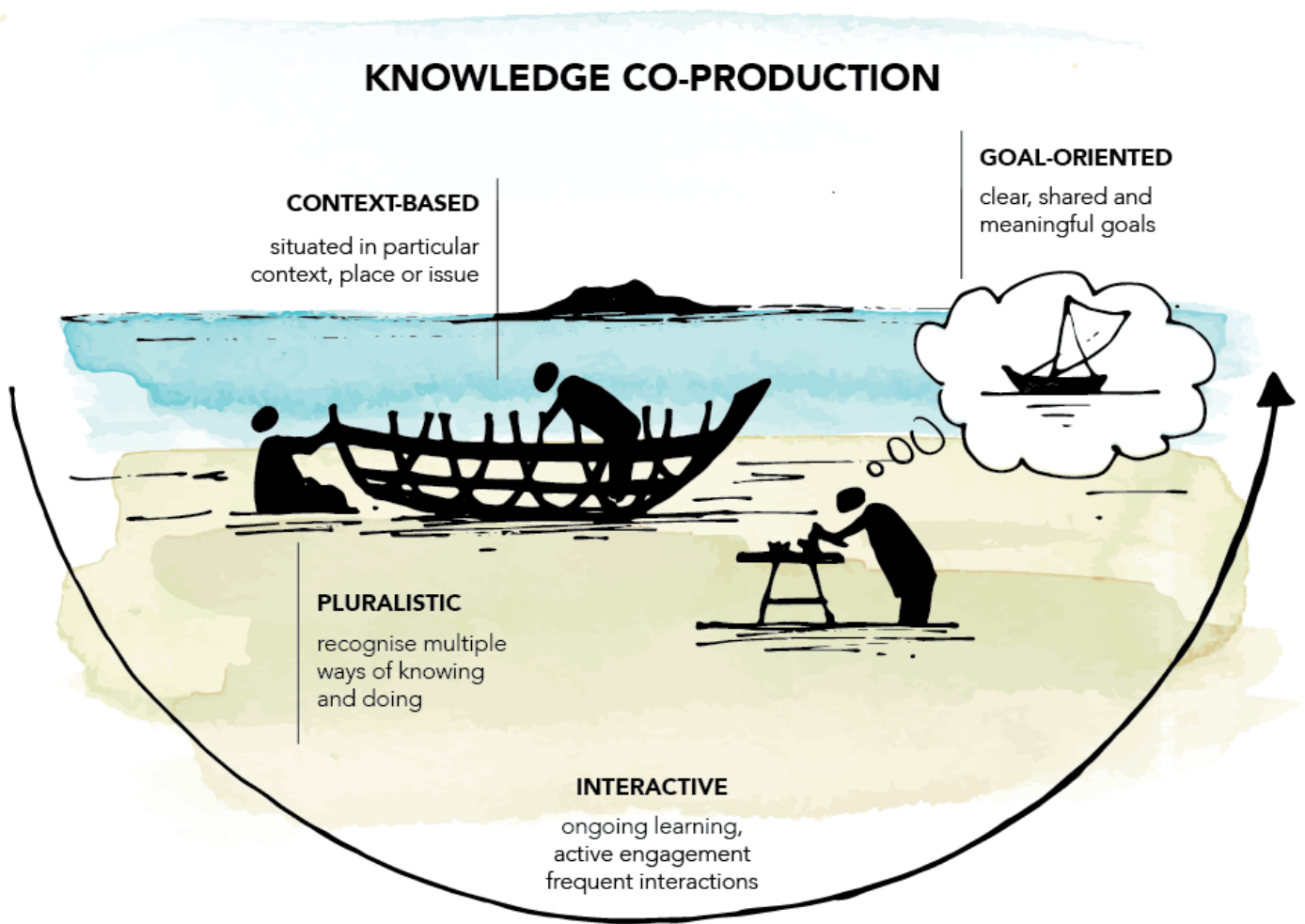


Figure 18 Co-production. Design concepts by the CSIRO team. Artwork by Dr Manuela Taboada, Queensland University of Technology

There are four principles for knowledge co-production in sustainability research:

CONTEXT-BASED

Situate the process in a particular context, place or issue.

GOAL ORIENTED

Articulate clearly-defined, shared and meaningful goals that are related to the challenge at hand.

PLURALISTIC

Explicitly recognise the different ways of knowing and doing.

INTERACTIVE

Allow for ongoing learning among actors, active engagement and frequent interactions.



BUILDING A BOAT EXAMPLE

You need to understand the context before you start building, including does the boat have to stay in a river, or estuary or go on the high seas, how many people the boat needs to carry, and what suitable materials are available (**CONTEXT-BASED**). For example, building a canoe is very different from building an ocean liner.

Once the context is understood, the team building the boat needs to have shared and meaningful goals around the type of boat to be built, time frames and budget (**GOAL ORIENTATED**). The team also requires different skills and knowledges to ensure it floats and is fit for purpose, including, at a minimum, a hull, propulsion mechanism (motor or sailing or paddle), mechanical, navigation, safety and other systems. These knowledges are highly contextualised, especially if the boats are built locally, like the wooden boats and canoes in the Pacific (**PLURALISTIC**).

As the boat is built, team members must constantly interact and learn from each other (**INTERACTIVE**). Often the team leader is the knowledge broker, ensuring that the boat building stays on track. However, they could not build the boat alone.

What do innovation brokers do?

Innovation brokers have to hold space for multiple voices and multiple options. They have to be flexible and give up preconceived ideas.

Generally, interpersonal skills and learning skills are crucial for solving complex problems. Innovation brokers need to build on the skills and competencies required for a knowledge broker and access a greater number of competencies to address challenges. In particular, entrepreneurial competencies are required to think outside the box, create things we have never seen before, and imagine very different outcomes and make them possible.

Innovation brokers

Analyse the context and look for relevant opportunities, problems, and solutions. They help build a shared vision.

Facilitate linkages between actors and identify complementary skills and resources essential to build and navigate the balloon.

They understand the system and facilitate interaction across it through multiple processes, including:

- action planning, and other tools
- identification and support to develop leaders that can manage multi-stakeholder processes
- translation of knowledge between actors
- building of trust
- motivating stakeholders
- managing conflict

Pacific islanders are good navigators. By building skills and competencies as you go down the river. With existing knowledge, you can sail or motor with a boat, but what happens when you get to the sea or as issues become more complex?

You need to find other modes of transport to get you to your destination more quickly and effectively, overcoming the crocodiles and sharks more easily and with a more strategic vision. One way to do this is to float into the air to see the whole picture and have 360-degree vision.

Innovation Brokers' role is to navigate and facilitate the creation of new solutions with diverse stakeholders and think outside the box.

INNOVATION BROKER EXAMPLE

CSIRO and local partners implemented the development of a maize cluster in Indonesia under a DFAT-funded project. The project initially started exploring drought-resistant maize and mungbean intercropping to improve soils, create more stable incomes, and enhance resilience to drought events. Initially, only researchers and the community were involved. However, it soon became clear that there were gaps in the innovation team and that stakeholders who supplied agri-inputs and finance were needed. The local research institution also knew that they could not reach scale. Therefore, they brokered a relationship with an agribusiness that established a number of small training centres to showcase the intercropping technologies and sell drought-resistant seeds and fertilisers. The local research institution with CSIRO brokered a relationship with a local bank to ensure credit for farmers, with the risk being born initially by the project.

The first year's success resulted in the local government wishing to scale the interventions across the island through a cluster. The net result was buy-in across multiple stakeholders to grow maize with mungbean, which has built resilience for the region.



Figure 19 Innovation brokers can see the big picture. Design concept by the CSIRO team.
Artwork by Dr Manuela Taboada, Queensland University of Technology

References and additional resources



If you would like to watch a YouTube video on this module, please see <https://www.youtube.com/watch?v=DHDoKf1GiOO>

Resources

WOOP

Wish, Objective, Obstacle, and Plan, or “WOOP”, is a science-based mental strategy that people can use to find and fulfil their wishes, set preferences, and change their habits. It was developed by Professor Gabriele Oettingen and her team.

In the links below you can find information about Prof. Oettingen and the basics of how WOOP works:

- <https://woopmylife.org/>
- <https://as.nyu.edu/content/nyu-as/as/faculty/gabriele-oettingen.html>

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Samantha Stone-Jovicich (CSIRO): an anthropologist with an interest in strengthening science's contribution to on-the-ground impacts and a focus on complexity-aware monitoring, evaluation and learning (MEL) frameworks and tools to critically assess current research approaches and practices and to foster experimentation with new ways of thinking and practice to better bridge science and meaningful, lasting social change.



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1300 363 400
+61 3 9545 2176
[csiro.au/contact](https://www.csiro.au/contact)
[csiro.au](https://www.csiro.au)

For further information

Environment

Michaela Cosijn
Michaela.Cosijn@csiro.au

Environment

Seona Meharg
Seona.Meharg@csiro.au