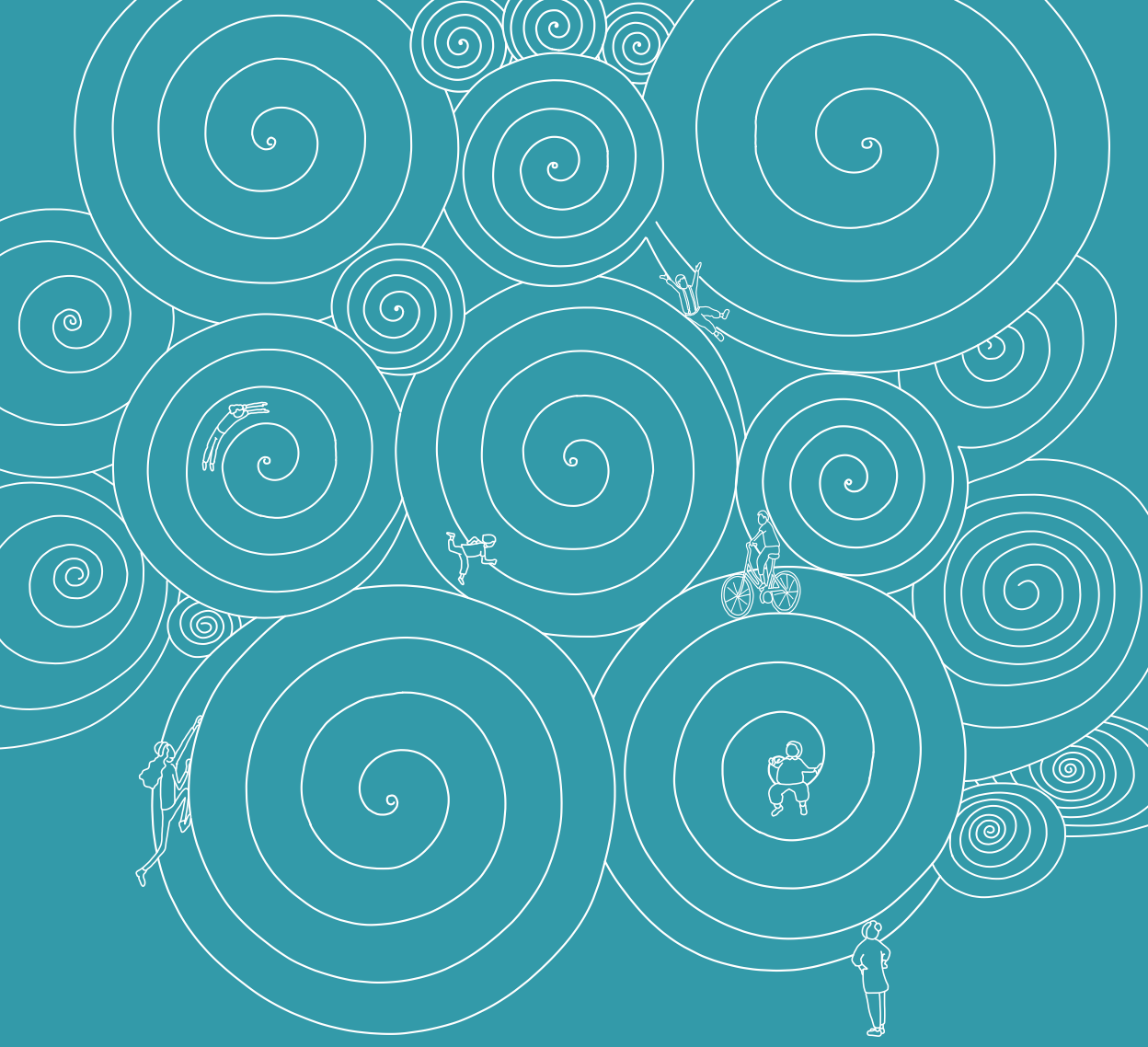
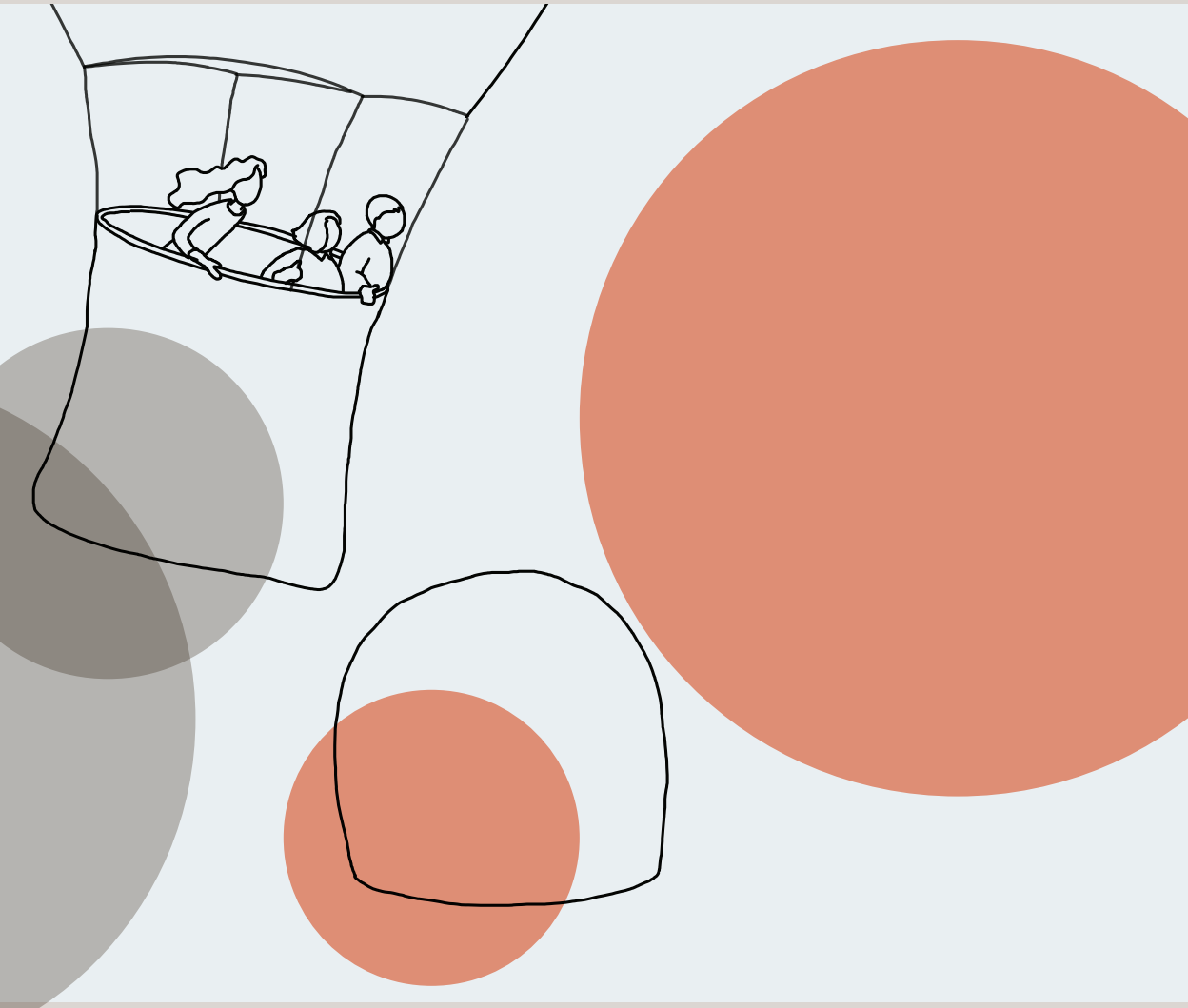


THE CRAFT OF SYSTEMS CHANGE

PRACTICAL TOOLS FOR A COMPLEX WORLD



CONTENTS

Authors

Shauna L. Mahajan
Louise Glew
Melanie Ryan
John Griffin
Ryan Murphy
Samantha Petersen de Villiers
Erica Rieder

Contributors

Allison Catalano
Shaun Martin
Megan Sam
Paul Ryan

Editor

Megan Eaves

Design

Melissa Carstensen, Concept Hive, LLC

Illustration

Sarah Greer

Mahajan, S. L., Glew, L., Ryan, M., et al. (2022) *The Craft of Systems Change: Practical tools for a complex world.* 1st edn. Washington, D.C.: World Wildlife Fund.

A NOTE FROM THE AUTHORS

When we began writing this book, we found ourselves cautiously optimistic. From our perspectives, the conservation and sustainability communities have made great strides in recent decades. At the same time, as we (virtually) gathered to write this guide, each of us found ourselves personally dealing with the fallout from a global pandemic and the all-too-real impacts of climate change. We know many challenges lie ahead.

Despite this, we continue to be inspired by the resilience and innovation we see in those trying to transform our planet. Thus, with cautious hope, we offer this guide to those seeking practical wisdom that can inform a more intentional way of navigating our unique 21st-century challenges in what we call The Systems Journey. While the idea of using systems thinking to guide our work is not new, it's often challenging to implement in a world wired for linear thinking, organized in silos, and enshrouded by economic, political, and social systems that often value short-term profits over long-term sustainability.

In 2019, several practitioners and scientists, all "systems thinkers," wrote a book called *The Art of Systems Change*. The book introduced the fundamental tenets of systems thinking and presented a set of eight mutually reinforcing principles (see p. 35) that can guide efforts to address our most pressing environmental and societal challenges.

This guide is designed to complement that book, channeling the philosophy of those eight principles into tangible phases of a journey. It is lined with stories, tools, and insights that support a way of working that aspires to be inclusive, holistic, and impactful. As we did then, we (the authors) acknowledge that we do not have all the answers for how to create systems change. We, too, are humans on our own personal journeys to apply these principles and cultivate the craft of systems change in our lives and work.

If our experiences have taught us anything, it is to maintain hope. There are ways to challenge and transcend the seemingly insurmountable barriers we face. We hope that, by sharing our own journeys through our stories and favorite tricks and tools, that you will also find ways to foster lasting systems change, one step at a time.

Acknowledgments

As humans strive to create a better world, we must acknowledge both the past and present of the lands we inhabit before we can navigate our way to a better future. We (the authors) wrote this book together virtually, with many of us thinking, writing, and learning our way forward on land that was stolen and continues to bear the painful marks of colonialism and repression. We recognize this traumatic past and acknowledge all those who were and still are the stewards of our shared lands, including the Nacotchtank (Anacostan), Piscataway, Beothuk, Mi'kmaq, Inuit, and the Innu Peoples. We sincerely hope that, by sharing our own experiences and pathways for creating change in the world, we can enable people to embrace a more holistic way of working in the world that acknowledges the past, and humbly and inclusively moves us toward a more just and equitable future.

We also acknowledge the many thinkers and doers who have been instrumental in developing the concepts, ideas, and tools synthesized in this book, many of who are quoted and cited throughout this guide. We extend a special thanks to the team that developed "Wayfinder" (Enfors-Kautsky, Järnberg, Quinlan, and Ryan, 2021) from which we drew much inspiration. We also thank the hundreds of people who "journeyed" with us in our quests to facilitate change around the world — including representatives of community-led resource management groups, non-profit organizations, government, and everyday citizens who helped us *learn and adapt* our way forward. We thank Gabby Ahmadia, Lovasoa Dresy, Kimberley Marchant, Modesta Medard, Harifidy Ralison, Rebecca Shaw, Annika Terrana, Maranda Valentine, and many, many more!

We extend our thanks to our community, who offered extremely helpful comments and reviews throughout the writing process, including Rodrigo Bautista, Hannah Becker, Anca Damerell, Federico Davila, Erika Drazen, Ruth Fletcher, Rebecca Freeth, Arundhati Jagadish, Mary Kaiser, Amelia Kissick, Jason Landrum, Ingeborg Magi, Irina Montenegro, John Morrison, Richard Nash, Nickson Orwa, Pablo Pacheco, Leigh Prezkop, Sarah Sharif, Althea Skinner, Eleni Svoronou, and Laura Winn. We thank all of those who helped design, edit, and illustrate this guide, including Alex Batka, Melissa Carstensen, Megan Eaves, and Sarah Greer. Finally, we thank Barbara Ruhling and the team from Book Sprints Ltd., who facilitated us through multiple writing "sprints," helping us refine and share our experiences and stories.

USING THE CRAFT OF SYSTEMS CHANGE

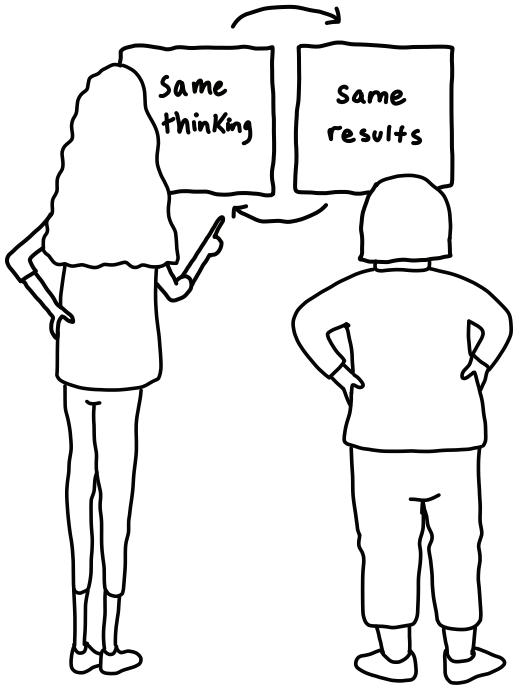
Have you been working on change initiatives for a long time? Have you celebrated successes, but the overall trajectory is not changing?

Or perhaps you intuitively feel that the dominant ways of working aren't serving us anymore?

Maybe you'd like to ensure that limited resources are being used in the best way possible?

Or do you just care deeply about what you do and want to see change happen and last?

IF YOU HAVE ANSWERED YES TO ANY OF THESE QUESTIONS, THIS GUIDE IS FOR YOU.



We have growing evidence that the world of the future will look different from the world of today. And yet many of the approaches that have been used to design the actions we take to create a more sustainable world fail to fully recognize this evidence. Approaches often value simplicity and assume that we can predict or engineer how our actions will create the desired future we aspire to create. Yet the systems we live and work in are complex and unpredictable. It is rare for transformative change to happen from perfectly planned and implemented projects. In fact, complex problems almost never have a singular "right" answer; trade-offs are inevitable because we live in a world full of different values and situations.

Simple and straightforward solutions alone are unlikely to enable the kind of structural or systemic change that is needed to create a sustainable future for people and nature. Solutions that have been shown to create the kinds of structural changes that transform systems are often counterintuitive, subjective —even surprising — and require us to change ourselves, our organizations, and the way we work before real change is possible in the world around us. We can think of this as our unique, 21st-century "systems journey."

In trying to create the types of changes that we wish to see in the world, we can take heart in the words of Nelson Mandela: "It always seems impossible until it's done."

What is the *Systems Journey*?

In this guide, the Systems Journey brings together the many ideas, tools, and ways of living and working in the world that are often traced back to the term *systems thinking*, a philosophy with multiple origins in Western thought. Systems thinking has similarities to indigenous "ways of knowing," which teach us that time, relationships, histories, and perspectives all matter (Goodchild, 2021; Reid, et al., 2021). Tools rooted in systems thinking give the capacity for different perspectives and to grapple with tradeoffs, and offer structured activities that advance our way of thinking and working with others who may see and experience the world differently.

The Systems Journey as presented in this guide introduces three broad phases of change how we can better **engage** with the people and systems, **explore** the future in ways that honor the complexity that surrounds us, and **learn** our way into an uncertain future. Within the phases, we share tangible steps, tips, and guidance that can help an individual or group facilitate and move through a process of creating change.

Some of these tips are simple (nothing beats a good question!). Others, which are introduced in Practical Tools for a Complex World (p. 167), are *tools* (also called "methods") for creating systems change. These tools were chosen because of their (1) ease of use (2) relevance for different phases in a Systems Journey, (3) capacity to uncover new insights rapidly, (4) ability to be applied in different contexts and settings, and (5) capacity to be used in different configurations together. They are also the tools that the authors turn to time and again as we strive to foster systems change.

The journey will seem familiar to many: It builds on the great efforts of those applying systems thinking and channeling holistic ways of being in the world into project planning and evaluation. It strives to make some of the implicit, successful tactics that have been tested and implemented over the last decades more explicit and presents these tools and approaches as an integrated and adaptable process. For others, the journey may feel different, challenging, even counterintuitive, particularly at points when it encourages letting go of preconceived notions about our habits, tools, and capacity to make changes in the world.

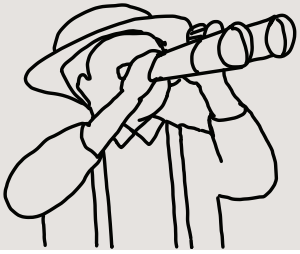
Who is this guide for?

This guide has been designed to meet the needs of those with some exposure to systems thinking and who want to embed systems thinking into day-to-day work. This guide can be used by project managers, facilitators, and leaders, alike. Truly, it is for anyone who wants to design and implement actions and strategies to address the complex and interwoven challenges of today. The Systems Journey requires only a commitment to embracing the complexity and uncertainty of the world, a willingness to listen deeply to other perspectives and values, and an openness to change.

This guide will help you:

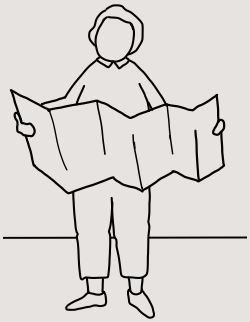
understand if you and your community might benefit from a Systems Journey;

navigate the different circumstances where opportunities exist for bringing systems thinking into practice;



think holistically and expansively about the kinds of tools, frameworks, and people that you might wish to bring to your work, from inception to implementation and adaptation;

engage with concrete stories that show the different ways systems thinking can be used in practice, in particular, to learn how tools can be applied individually or in unique combinations to enhance efforts to create change;



and finally, just **try** things out.

The Systems Journey embraces a spirit of questioning, learning, and experimentation. By interacting with the stories, questions, and tools in this guide, we hope you can find new ways to take your own next steps.

When to use (or not to use) this guide

Depending on your familiarity with systems thinking, experience in facilitation, and where you are in a project or a program, you may use this guide in different ways. For some, this may involve experimenting with one or two tools with a small group or in an informal setting. For experienced facilitators, you may start to weave these ideas and tools into your existing work facilitating change with large groups of people who hold varying degrees of power. Some may go a step further and seek out additional systems tools to expand and build your toolkit, drawing on the many additional resources that we refer to throughout this guide.

While it's almost always possible to start a Systems Journey of some kind, it's important to know when *not* to embark on a journey, too. It is rare to find the perfect conditions for a journey, but there are sometimes conditions that make the likelihood of success very low. In our experience, these include:

- You or others don't want to work in a new way or have a strong aversion to risk and uncertainty
- An insurmountable lack of trust between certain stakeholders in your system
- Extenuating political agendas overshadow goals of your particular journey
- Your end goal is in conflict with the collaborative principles of a Systems Journey (ie you want everyone to adhere to YOUR solution!)
- You're tightly constrained by external drivers and processes and lack the agency or desire to deviate from the norm
- The only way collaborators will work with you is if there's funding on the table

Look out for these, and should you embark on a Systems Journey, take your first step with eyes wide open!

What to know before diving in

A basic understanding of systems thinking is helpful but not essential. The companion book to this guide, *The Art of Systems Change*, is a primer on complex systems, distilling insights from many disciplines and schools of thought. Read this before or after exploring this guide to deepen your knowledge of the theory and principles behind the Systems Journey.

Throughout this guide, you will see terms and phrases that are specific to systems thinking. Reading *The Art of Systems Change* first will provide a good foundation in much of this terminology. You'll also find the **Phases**, **Steps,** and **Tools** of a Systems Journey listed in **bold**; and special terms and phrases in *italics*, which are listed and defined in the Glossary (p. 231).

ENJOY! WE INVITE
YOU TO EXPLORE AND
BE CURIOUS ABOUT
WHAT YOU WILL FIND
HERE AND, HOPEFULLY,
HAVE SOME FUN
ALONG THE WAY.

THE SYSTEMS JOURNEY

"NOT ALL THOSE WHO WANDER ARE LOST."

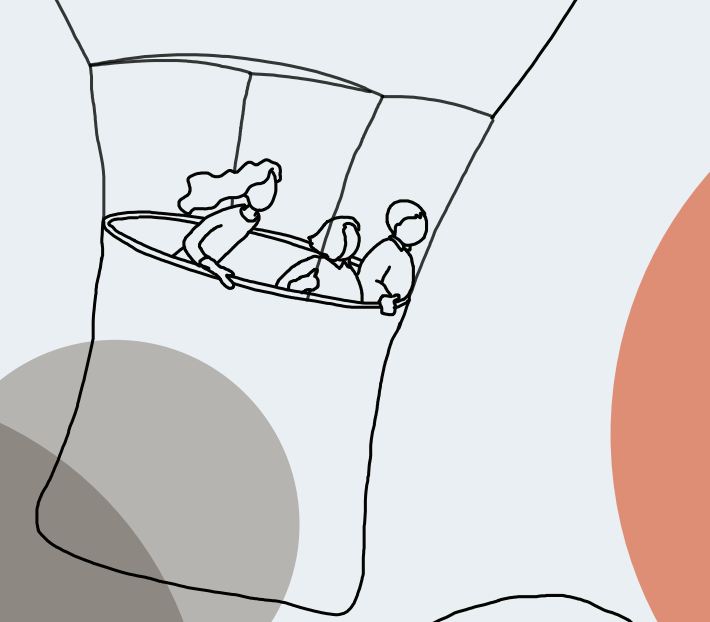
J.R.R. TOLKIEN

The Systems Journey brings together ideas, principles, and tools in a way that can help us navigate and embrace the complex realities of the world in which we live and work. It builds on principles of adaptive management, systems thinking, strategy design, and collective action. What most distinguishes this from other approaches is the mindset that is needed. A Systems Journey is highly collaborative and iterative and the tools are designed to help us think more deeply, see the world from different perspectives, and critically examine our assumptions and biases.

Phases of the Journey

The Systems Journey has three phases: **engaging** with your own personal intent and with others in the system to explore its current and past dynamics; **exploring** collective visions for the future and challenging assumptions around the actions that can catalyze systems to change, and **learning our way forward** through iterative experimentation and moments of reflection that draw on the evidence and knowledge of those around you. Within these three phases are seven distinct, but related, steps.

We recognize that, in the day-to-day realities of work, it is rare to have a "wide-open horizon" to implement these phases one by one. Realistically, you may find yourself iterating through the phases at different paces over the course of hours or days, at almost any stage of a



project or program. You may also find yourself diving deep into only one or maybe multiple steps, depending on your role in the system and the work already done. Other times you may jump in toward what seems like the end of a journey only to find a window of opportunity to start a new one. And sometimes change takes time; while you may go through phases rapidly over a short period, you may realize that you are part of a much longer and broader journey. No journey is the same.

Below, we introduce the three phases of the journey in more detail. In the next chapter and throughout the guide, you'll find stories that show how a journey can begin in unexpected ways at unexpected times, all in the spirit of learning our way forward.

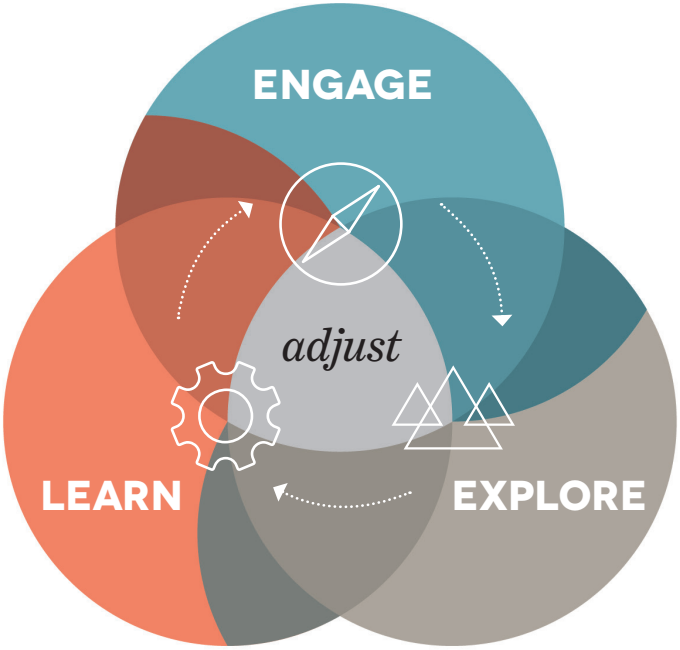


Figure 1. The Systems Journey

PHASE 1 **ENGAGE**

STEP A Orienting yourself as a navigator

STEP B Understanding the system

PHASE 2 **EXPLORE**

STEP C Co-creating visions for the future

STEP D Analyzing leverage

STEP E Developing systemic theories of change and action

PHASE 3 **LEARN**

STEP F Sensing systems change

STEP G Learn and adapt

Phase 1: Engage

Phase 1 involves *orienting* ourselves by reflecting deeply on why we are undertaking this journey and looking inward at our individual intents and capacities. It requires slowly taking in our surroundings before taking any big steps (Step A: Orienting yourself as a navigator, p. 39). We then spend time with others and explore different perceptions on the structures, patterns, and dynamics of the system(s) (Step B: Understanding the system, p. 59). The intent here is to reach a shared understanding of the system(s) in which we are embedded, including their histories and power struggles, and the systemic behaviors or structures (which are sometimes but not always perceived as problems) that we may want to change. Reaching this shared understanding requires us to see ourselves in the system, to understand and engage with divergent perspectives, and identify the political, social, and cultural lenses that influence our perceptions of the system. It also requires us to navigate relationships with those whose values and goals may be different and to hold space for tensions and differing opinions. We emerge from Phase 1 with a growing, but never complete, understanding of how the current system works and how it is perceived, along with a set of new relationships that we will continue to cultivate as we move forward in the journey.

Phase 2: Explore

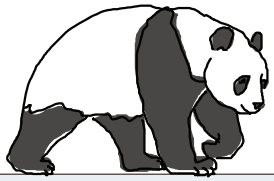
In Phase 2: Explore, we imagine the many futures that are possible using tools and the power of storytelling, and we ask ourselves how those future systems might behave (Step C: Co-creating visions for the future, p. 83). We harness the power of leverage and look for areas where a little effort can catalyze deeper structural change (Step D: Analyzing leverage, p. 95). With this broad exploration as our base, we become more specific and tangible in setting goals to explore how change might happen and how our actions might catalyze it. We stress-test potential actions against existing knowledge and capacities (such as time, funds, expertise, and values) and might find that more help and expertise are needed to effectively learn our way forward (Step E: Developing systemic theories of change and action, p. 111). As we explore, we may discover that the emerging opportunities for change do not align with our individual or organizational expertise, experience, or funding models. This might signal a need to reimagine our role in the journey, which may involve taking a step back, bringing in new people, amplifying the roles of existing partners, or simply iterating further to understand how we might be best positioned to catalyze systems change. This process of sifting through opportunities for change often leads back to Phase 1, where we refine our understanding of the problem, the system, and our role in it. The intent here is to widen the horizon and challenge assumptions about how change might happen and how to catalyze it.

Phase 3: Learning our way forward

In Phase 3, we elevate the importance of learning and adapting as we implement. We change *how* we work and become intentional about the information and knowledge that we collect and listen to. We go beyond measuring impact and expand our monitoring toolkit to include measures of the process of working with others, and measures that help us keep a pulse on the big-picture changes in our system (Step F: Sensing systems change, p. 129). We actively integrate the insights gained from experimenting in the real world into our understanding of the system, our vision of the future, and the pathways we will take to reach that vision.

This phase involves an evolution in our understanding of the system and the theories of change and action we created. With each experiment, we move back to Phases 1 and 2 to update and refine our understanding of the system, how change happens, and what actions we can and should take (Step G: Learn and adapt, p. 145). When we learn our way forward, we deliberately create space to pause and reflect on our biases, what we do, how we work, and even who we work with. We use *learning questions* and *powerful questions* (either formally or informally) to understand why and how change is happening and to challenge our assumptions of the world. We may identify new questions that we did not previously know to ask. Learning our way forward gives us the license to take new pathways toward action that catalyzes change in the systems around us.

ENTRY POINTS FOR SYSTEMS CHANGE



"THE IMPEDIMENT TO ACTION ADVANCES ACTION. WHAT STANDS IN THE WAY BECOMES THE WAY."

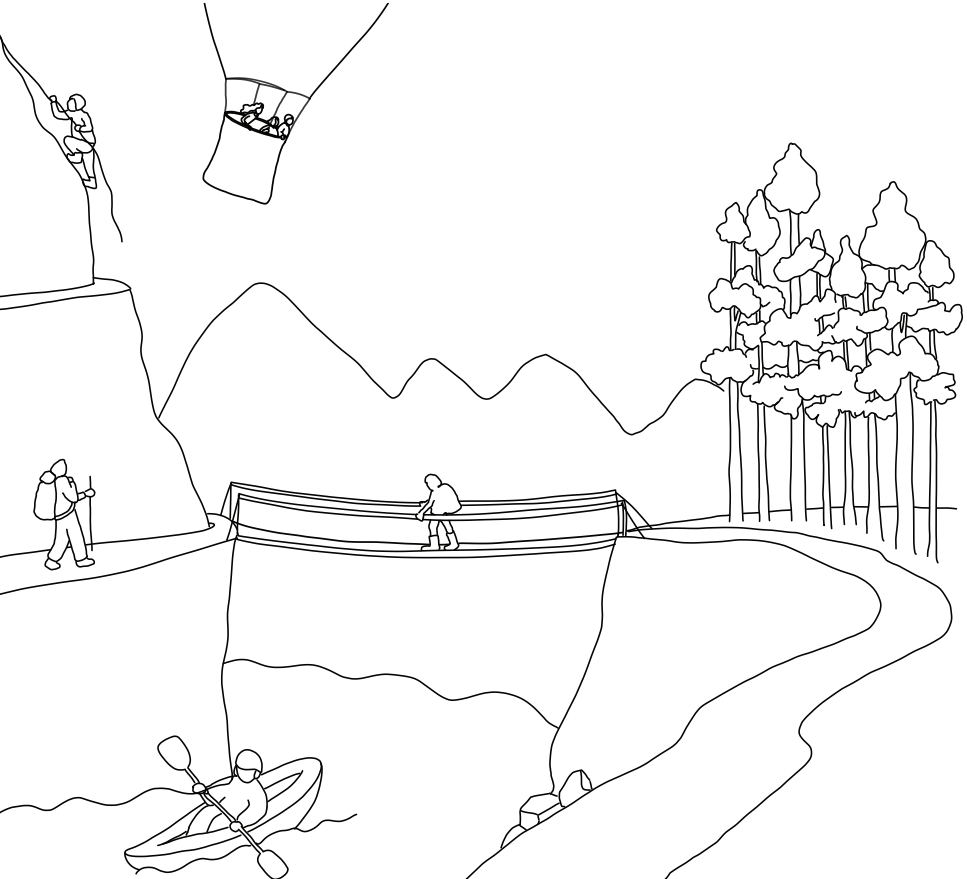
—MARCUS AURELIUS

We never need to wait for a wide-open horizon to begin a new Systems Journey. The opportunity to start from scratch using systems-thinking approaches is, in some ways, an illusion. All of the systems in which we work have histories that inevitably influence any action we wish to take. Thus a "real world" Systems Journey can begin at any point in the life of a project, program, strategy, or organization.

Using systems thinking to create change in the world does not require throwing out everything we know about how to plan, act, monitor, and adapt. Instead, systems thinking encourages us to start where we (and others) already are and learn our way forward. The realities of our operating norms and organizational structures mean that there are some common scenarios that we see time and again. These can easily be turned into moments to begin a journey (see Table 1). We call these *entry points***.** These moments hold promise for shifting the norms around us or charting a new pathway that can change how we work and how institutions operate in the long term.

In this chapter, we outline some, but not all, of these common entry points and share illustrative examples from the real world to show what a journey can look like. Throughout this guide, you'll find additional stories that illustrate how tools were used within a variety of entry points to introduce elements of systems thinking, and what happened as a result.

Entry points represent different sets of opportunities, constraints, and tradeoffs. Each entry point describes a common situation where a *navigator* (someone seeking to make transformative change in the world) comes face-to-face with the linear structures and processes that often inhibit the capacity to work holistically. Each story shows how an entry point turned what could have been just an ordinary moment into an opportunity to think and work differently. The journey encourages us to do just that: start where we are and turn everyday moments into opportunities for fostering systems change, one step at a time.



Entry points for systems change

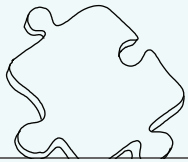
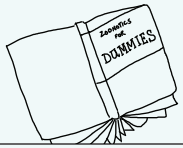
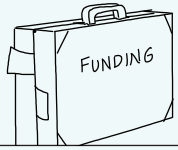
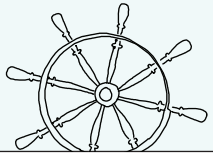
Entry point	Example scenario
Infusion 	You've been given a grant to carry out a set of activities, and you're trying to figure out how to carry out the activities you committed to, while also using systems thinking to inform the project's implementation, even though it was not part of the original design.
Middle Of The Puzzle 	You have some initial ideas about how to solve a problem but are not sure how and if these ideas will work in the "real world" or the best first steps to take.
Crash Course 	You have been asked to lead on developing a strategy for a new problem that you don't yet fully understand. You need to learn about the problem, find out what expertise you're missing, and who the right partner is for the job, all the while writing and rewriting the final strategy for a funder.
Finger Trap 	A donor has put out a Request For Proposals and has already articulated what they think the problem is. You need to develop a proposal that proves you and your team are the most well suited for the job and how your organisation can fit the call while still remaining true to a 'systems approach' that embraces uncertainty and different perspectives.
Turning The Ship 	You've been managing a body of work for some years now and your new boss (or board) has asked you to refine your theory of change as part of an internal strategy review process.

Table 1: Entry points for systems change

Entry point: Infusion

You've been given a grant to carry out a set of activities, and you're trying to figure out how to carry out the activities you committed to, while also using systems thinking to inform the project's implementation even though it was not part of the original design.

Context

"I was brought into a project that was designed to support community-based conservation (CBC) in two countries halfway through the project's grant cycle. On planning calls with colleagues, we talked about the activities we were supposed to implement next (according to the work plan submitted with the grant proposal). After several conversations, we realized that we had a limited understanding of how the work that was proposed could actually support community-based work in the long term. While, technically, we were deep in "implementation," our original proposal had framed activities quite broadly and didn't seem fit for purpose now that we had lost the staff and partners who had written the original proposal."

Entry point

"We could have just plowed forward with the original work plan. Instead, we decided to use the flexibility in our grant to pivot and take time to better understand the systems we were working in, so we could eventually design and implement more impactful actions. This decision was the first step on our Systems Journey."

Process

"We knew that we wanted to better understand the various perspectives held by different stakeholders involved in community-based conservation. So, mid-implementation, we took time to "understand the system" (Phase 1: Engage). Throughout an eight-month-long process, we implemented a number of tools. We used **Semi-structured Interviews** as part of a social science research project and convened several large, multi-stakeholder workshops, where we used the **Iceberg Model** and **Visualizing Situations and Change** to understand the different perceptions that stakeholders had toward community-based conservation. **Rapid Cycle Prototyping** was also used to help explore visions of the future and helped uncover that community leaders perceived the challenges surrounding community-based conservation quite differently from staff working for NGOs and governments (see Stories from the field: Just ask "why," p. 188). The Rich Picture method from **Visualizing Situations and Change** provided space for dialogue between members of community associations and helped to elevate the learning questions they were grappling with. At the end of our work to "understand the system", our team left with a much deeper understanding of how the system currently worked that recognized and represented

different perspectives. It led us to slightly modify some of our existing activities to better address the problems we heard about. For example, we recognized the need to focus our activities on addressing the power imbalances between community groups and government, which required elevating the role and expertise of community-based groups. We also learned that developing more targeted interventions to support fundamental governance mechanisms — such as good conflict resolution — were still very much needed, and not originally on our radar."

Insights

"In this case, we needed to 'slow down to speed up.' Though technically we were in the project's implementation phase, we needed to take the time to revisit the earlier phases of the Systems Journey given changes in the project's team and context. This helped us identify actions that were more fit for the time and place. The specific outputs that came from this learning process (a research report and system diagrams) helped make our grant-renewal process much more straightforward and gave us greater confidence in the actions we were proposing to take. It also provided rich insights for other grant proposals submitted around the same time for the same context. But most importantly, the learning process helped open up our narrow understanding of community-based conservation by including the needs and perspectives of more diverse voices."

Entry point: **Middle of the Puzzle**

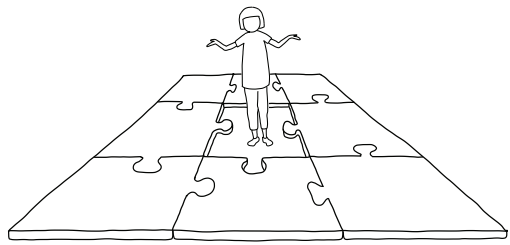
You have some initial ideas about how to solve a problem but are not sure how and if these ideas will work in the "real world" or the best first steps to take.

Context

"I was asked to support a group developing a theory of change to inform how to intervene in global trade to support biodiversity conservation around the world. Specifically, I was invited to co-facilitate and design a workshop involving people from different countries around the world and close to 50 partner organizations."

Entry point

"The participants had already developed an initial situation analysis and described parts of the problem from their perspectives. The team had some idea of what actions they wanted to take to address theories of change related to knowledge and data, engagement, and capacity



building. While this initial work had not taken an explicit systems approach, it represented a good enough foundation of 'engaging with systems actors' (Phase 1: Engage) to enable us to take a deeper look at 'exploring the future' (Phase 2: Explore). My mandate was to support the group to explore how to connect their proposed solutions into a clear, credible theory of change."

Process

"As with any workshop, the work begins before everyone meets in the same room. A few months prior to the workshop, we started to unpack the existing situation analysis and initial ideas for interventions. We surveyed workshop participants using the online tool Survey Monkey to uncover how people thought the collaboration would create change, what change was most critical, how these changes would play out in the real world, the greatest barriers to creating change, what evidence people used to understand the situation, possible interventions, and impacts of those interventions.

We combined insights from these surveys with scientific literature on global trade and biodiversity, and with **Semi-structured Interviews** with key stakeholders in the system. The intent of this pre-work was to try to foster a more collaborative workshop-design process, to begin the co-creation process before people were together in the same room. It also allowed us to overcome some of the challenges associated with a global group, time zones, and languages, and to include those who were not able to travel. All this work led us to have three productive days together when we focused on iterating between phases of the Systems Journey to develop a clearer picture of which actions the group should take next.

We used **Systems Mapping** exercises to identify linkages, loops, and entities in the current system. We combined these systems maps with **Stakeholder Mapping**, with a special focus on the power held by stakeholders and their interests to begin to identify leverage points in the system. We iterated between the situation, problem, and vision of the future to critically examine our thinking and deepen our understanding of the options for change (Phase 2: Explore). The facilitation was tailored to address power dynamics in the room and to build trust and listening. The process was iterative with each output building on or complementing the previous outputs. As the group learned together, they were able to move more fluidly between and along the different phases of the Systems Journey."

Insights

"The group left the workshop with the first draft of a theory of change that represented the many perspectives in the room. This product was also quite different from what the organizers initially envisioned. The process helped the group realize that there was no single solution that would solve the global problem. Instead, a global *theory of change* would help each country work on its own localized *theories of action*, which could then be tailored to context while remaining connected to the global theory of change. The process allowed for

differences to be recognized and seen as strengths, as opposed to being perceived as problems to overcome, or that one thing should be included over another.

The process also helped open up a conversation about who else needed to be part of the initiative, both at local and global levels, and how a *learning mindset* could help them revisit their interventions in the future. A number of *artifacts* and outputs were generated that have supported the group's collaborative work, including a logframe, research plans, a partnership-development strategy, communications materials, proposals, and monitoring and evaluation strategies. Finally, a number of non-tangible outcomes included strengthened relationships and mutual understanding between diverse stakeholders from different countries within the partnership. Of course, it was not always easy: the process created space for uncomfortable conversations in which values and views were challenged. Many grappled with how to balance this open, flexible way of working with their operational structures, demands, and norms."

Facilitator's tip: "Not another workshop!"

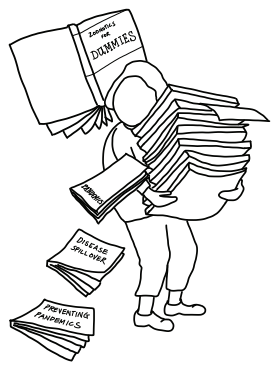
Not every Systems Journey needs to begin and end with a workshop led by an expert facilitator. While it's very helpful (and often essential) to bring in an experienced facilitator at some point during a systems process, many of the tools introduced in this guide can be adapted and used in everyday situations to encourage regular systems thinking and action. You'll find examples of these woven into the stories shared in this book. While workshops are very helpful to advance a journey or mark an inflection point, the average, day-to-day entry points can serve as equally-powerful mechanisms for fostering systems change.

Entry point: **Crash Course**

You have been asked to lead on developing a strategy for a new problem that you don't yet fully understand. You need to learn about the problem, find out what expertise you're missing, and who the right partner is for the job, all the while writing and rewriting the final strategy for a funder.

Context

"In the wake of the COVID-19 pandemic, our organization was interested in better understanding the role conservation can and should play in reducing the risk from zoonotic disease spillover. In some ways, it was a brand new topic, but in other ways, it built on much of the organization's existing work."



Entry point

"The desire for a new strategy paved the way for a crash course in learning about zoonotic disease emergence. With strong leadership support, I was part of a team of scientists tasked with doing an initial review of the scientific literature on zoonotic disease spillover, which served as a foundation for a virtual, multi-week workshop. The aim of the workshop was to help further the organization's thinking and produce a document that could define the "problem" of zoonotic disease spillover along with possible solutions to form the foundation of future fundraising proposals. As an internal facilitator, I became part of a core team that helped to design the process, exploring the root causes of zoonotic disease spillover based on the scientific review and from the perspective of the diverse participants involved in the virtual convening."

Process

"Designing the workshop was a process in itself. The core design team was composed of internal facilitators from the organization, like myself, as well as external facilitators with experience using tools for systems change. Recognizing the complexity of the topic, the team worked to identify a set of internal and external stakeholders to invite into the process. The workshop was virtual, so to accommodate time zones and the schedules of external stakeholders, **Semi-structured Interviews** were used to elevate perspectives of those who couldn't participate in the full workshop. Insights from interviews and discussions between workshop attendees (who included participants from across the organization) helped contribute to the iterative development of a **Systems Map**, which was then discussed in the context of a set of future scenarios developed via a short **Scenario Planning** exercise. A quantitative leverage analysis of the systems map created "mini-maps" that participants used in small group discussions to identify possible actions. Drawing on ideas from **Rapid Cycle Prototyping**, actions were stress-tested through participant feedback and facilitated discussions, referencing the systems map to understand how actions might address different relationships in the system."

Insights

"While a lot of work, the crash course was worth it as it provided a unique window of opportunity in which nearly everyone involved in the process showed up with a *learning mindset*. This was key in turning what could have been a stressful process into an opportunity for learning and change on both individual and institutional levels. When the workshop ended, the core team tasked with moving the initiative forward had a set of *artifacts* from the journey, including an interactive systems map, interview notes, and lists of potential actions and new partners that had been engaged in the interviews. All these artifacts and relationships still serve as a strong foundation for the team to learn their way forward."

Entry point: **Finger Trap**

A donor has put out a Request For Proposals and has already articulated what they think the problem is. You need to develop a proposal that proves you and your team are the most well suited for the job and how your organisation can fit the call while still remaining true to a 'systems approach' that embraces uncertainty and different perspectives.

Context

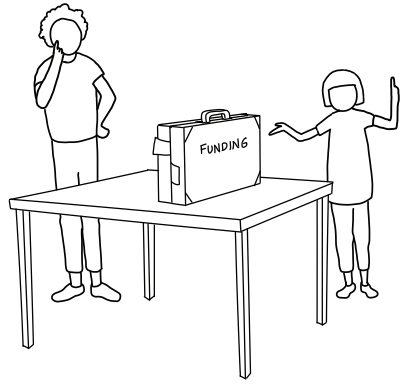
A new request for proposals came out that focused on reducing overfishing: Our organization works in close partnership with coastal communities on a range of marine conservation issues, so it was a natural for us to develop a proposal to submit to the RFP.

Entry point

The proposal and the proposal process was a powerful entry point: In the NGO world when there's money on the table, it's a good opportunity to stop and reflect on how and what we might want to do differently. On the other hand, it's easy for people to get distracted by the possibility of funding so we had to be mindful of that. In the end, we chose to use this particular proposal as an opportunity to think a little differently about what we do in our work, and how we do it.

Process

Instead of focusing solely on our power to solve the problem and realize the funder's theory of change, we took a different approach to the proposal process and emphasized the power of convening to tackle overfishing: We used the time and momentum we had around the possible funding to bring different perspectives to the table. Using the proposal process as an excuse, we convened diverse stakeholders including representatives from fishing groups, the fishing industry market, the management authority, and fish consumers to create a narrative that helped 'open up' the different perspectives different stakeholders had about the future of fishing. Our proposal to the funder, instead of overemphasizing our natural fit for the problem, focused on unpacking for the funder the different ways the different stakeholders viewed the problem and emphasized our strength as a convener. From this, we then identified tangible actions that could help different stakeholders meet their different goals and start to work towards a shared vision. Writing the proposal this way also helped unpack some of the implicit assumptions that the funder had about what their resources could help solve, prompting more honest dialogue between the grantor/grantee. We also made sure to tee ourselves up for a true Systems Journey by creating a tangible but flexible monitoring and evaluation plan that centered on



learning. We proposed different measures that would help track changes across the different levels of the system, and how change might be perceived by the different stakeholders involved in the fishery and shift in stakeholder's values and beliefs. While the proposal is really just the beginning, we hope that by making our intentions around learning explicit with our partners and funders, we will be set up for a true systems journey as we take our next steps.

Insights

"In the nonprofit world, opportunities for funding are always powerful for many reasons. In this situation, we tried to use that power to open up perspectives on the problem and pave the way for a new way of working with our partners. While the proposal was just the beginning, we hope that, by making our intentions around learning explicit with our partners and funders, we will be set up for a true Systems Journey as we take our next steps."

Entry point: Turning The Ship

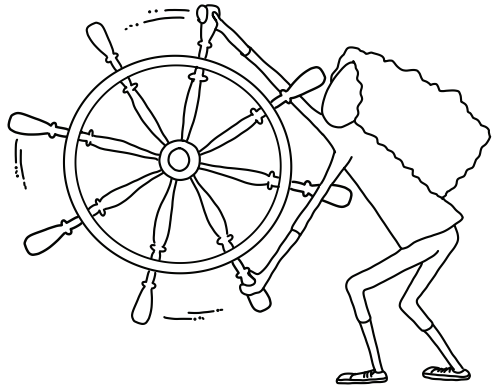
You've been managing a body of work for some years now and your new boss (or board) has asked you to refine your theory of change as part of an internal strategy review process.

Context

"The national NGO I work for was being asked by its board to review its current organizational strategy to inform a new strategy for the next five years. As an internal facilitator, I was tasked with designing a process that would guide our team through this strategy review and wanted to use the opportunity to help bring systems thinking more intently into our organization's approach to conservation."

Entry point

"In my case, the entry point was quite clear. While not always the ideal starting place for innovation and new ideas, having the authority to rethink our strategy from the top down was a powerful window of opportunity. Our entire institution was being granted the chance to step back and reflect on what we were doing and why. Our task was not small — we all knew there was a chance that our strategy review would result in a major turn away from what we knew, what we were comfortable with, and what many of us were trained to do. There was a possibility we would move



toward new programming and ways of working that, while potentially rewarding and impactful, were also hugely uncertain and risky."

Process

"We designed a process that would operate in a light-touch way over the course of eight months, with particular moments when we would go much deeper into a different part of our Systems Journey. One of our first exercises was to step back and 'understand the system' (Phase 1: Engage). We started with a **Historical Timeline** (see Stories from the field: three timelines, p. 178), which helped bring the concept up time front and center in all our following discussions. Afterward, we organized teams around our organization's big themes: oceans, freshwater, wildlife, etc. Within these small groups, we began mapping the systems using **Systems Mapping**.

For some, this felt repetitive at first, as we all knew these systems inside and out! But over time, the mapping process helped unlock a deeper conversation about what was important in the particular moment in time. We also used an online platform that provided a clear structure and format for the mapping exercise, which forced participants to confront certain parts of the system and questions that, in the past, they would have just skipped over. The exercise also encouraged participants to continuously question assumptions, and reflect on what kinds of evidence and knowledge they might be using to back up their assumptions. The next step was to explore which theories of change had been implicit in their minds to date and to reflect on whether the assumptions underlying those theories of change had, in fact, held true when they carried out their work plans. Later in the process, we revisited these maps and reflected on our past actions using **Pause and Reflect**. We asked questions like, 'What surprised us?' 'Were past actions successful?' and 'If not, what would the system look like today if they had been successful?'"

Insights

"This process was a fundamental shift away from how the organization had planned in the past, toward an approach that really kept the system front and center in the conversation at all times. In the past, we always oversimplified things as we reflected on past actions and tried developing new ones. Bringing the systems map into the conversation throughout our whole strategy process helped us preserve our recognition of complexity and understanding of the system from inception to fundraising. This was a particularly interesting exercise as we were, in many ways, trying to move a large network of people toward a (possibly) new and better way of working. The Systems Journey helped us navigate that transition well, building on the past while still moving forward."

8 PRINCIPLES FOR THE JOURNEY

In 2019, a group of systems thinkers published *The Art of Systems Change*, which introduced the fundamental tenets of systems thinking and presented a set of mutually reinforcing principles that can guide efforts to address today's most pressing environmental and societal challenges. The principles were designed to help challenge how we think when we're creating change, and you will find references to them throughout this guide.

1

Principle 1: See ourselves in the system

We are all part of the systems we strive to change. By seeing this, we can sharpen our awareness and attune ourselves to the feedback and relationships that occur between our individual and collective actions and the broader systems within which we exist. Cultivating mindfulness, humility, and acceptance of the complexities that surround us provides space for reflection, which can in turn make us strong and resilient agents of change.

2

Principle 2: Identify our frames

The way that we define problems shapes how we find solutions. Our perceptions of problems are often limited by our experience, values, and beliefs. Failing to recognize this can increase the risk of misdiagnosing problems based on incomplete understandings of systems. By developing the ability to identify, stretch, or reduce our frames when needed, we increase our capacity to see problems in the context of the systems that generate them, increasing the set of solutions we can reach.

3

Principle 3: Co-create with intention

Creating social and environmental change that lasts relies on the behaviors of all actors in a system. Intentional co-creation involves defining problems and solutions together with actors in a system and includes creating a safe space where the diversity of views and visions for the future can co-exist. Not only is co-creation an ethical way to drive change, but it is also essential for building a coalition of actors with the capacity for enacting change.

4

Principle 4: Explore time and scale

We are often tackling problems with limited time at too small a scale. Developing a sensitivity to both time and scale can help us become attuned to the underlying patterns and trajectory of systems change. With this attention, we can design actions in ways that harmonize time and scale, and build solutions that work with — and not against — systems.

5

Principle 5: Find simplicity in complexity

The belief that there exists a simple solution amidst great complexity is important for those wrestling with intractable problems. By working to truly understand and navigate complexity, we train ourselves to discern points of leverage that offer opportunities to transform system structures, patterns, and behaviors. By identifying simple solutions, we're equipped to communicate the elegance of systems change, and build stronger foundations and coalitions for change.

6

Principle 6: Experiment iteratively

Described most simply as "learning by doing," experimenting iteratively builds our capacity to think and act both quickly and slowly. Systems are always changing and to ensure our actions are fit for purpose in this ever-changing world, we need to build the ethos of learning and experimentation into our behaviors, organizations, and the systems we inhabit. Experimenting iteratively offers us a way to use our experiences as opportunities to learn, integrate, and adapt.

7

Principle 7: Align structure with change

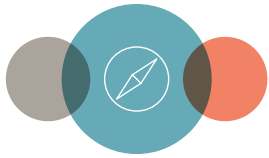
The formal institutions that govern our work have the power to either inhibit or advance our capacity to drive change. The environmental and social systems we strive to influence are complex and adaptive; therefore, the institutions and programs that address these problems must also have the capacity to adapt and respond to changing conditions.

8

Principle 8: Act based on evidence

Acting with evidence encourages evidence-based reflection, which aligns monitoring with the knowledge needs and actions of all actors in a system. Monitoring change in complex systems goes beyond measuring the finite impact of our actions and includes understanding the dynamics that our actions influence, the relationships that exist, and the trajectory of structural change.

PHASE 1: ENGAGE WITH SYSTEM ACTORS



Step A: Orienting yourself as a navigator

"THE WORLD ISN'T JUST THE WAY IT IS. IT IS HOW WE UNDERSTAND IT, NO? AND IN UNDERSTANDING SOMETHING, WE BRING SOMETHING TO IT, NO?"

YANN MARTEL

OVERVIEW

Overview

- A navigator in a Systems Journey helps cultivate and steward a journey over a period of time. There can be one or many navigators on a journey.
- If you are navigating a journey (together with others!) it helps to take time to reflect on your individual role, your surroundings, and your entry point. It helps to do this not just at the start of a journey but periodically throughout. This helps you as a navigator better see yourself in the system and approach the journey with a better sense of your own purpose and intent, as well as those around you. (Principle 1, p. 35)
- Orienting yourself as a navigator involves four steps:
    1. Orienting internally by reflecting on how your personal worldviews and intentions relate to the journey
    2. Orienting externally, by starting to understand the system you're working in
    3. Checking your conditions, which includes the capacities you currently have or lack and the conditions that could help, hinder, or harm your journey
    4. Finding a core team to be your allies and close partners throughout your journey

Common outputs from this phase:

- An awareness of your own role in a change initiative and a list of strengths and assumptions you bring to the process
- Notes on future partners, key stakeholders, and tough issues
- A set of roles and responsibilities for a team structure or a needs/gap analysis of where you might want to engage additional skills or talent
- A diverse team with the ability to engage in processes of self-awareness and learning
- Draft analyses or reviews of your and your team's capacities and of the situation

Common capacities cultivated in this phase:

- Capacity to create time for mindfulness and reflection
- Ability to identify any personal biases or worldviews that might limit or influence your role in the journey
- Ability to identify the kinds of capacities you need in others to support you on a journey

The place we find ourselves

And so begins our Systems Journey. When we first start, there's a lot to take in. While the terrain of a new journey might seem vaguely familiar at the outset (we may be working with a familiar topic, people, or organizations), as you look more closely, you might notice some differences. Perhaps there are some new companions on the path with you. The place or topic you are addressing might be populated with different people, cultures, plants, or animals — some like old friends, and others who present unique challenges or opportunities. As you begin to scan further, you might glimpse new visions of the future in the distance, thorny parts of hard-to-pin-down problems, or can smell smoke from a far-off burning issue that must be dealt with.

As you ponder your next step, it's helpful to take a deep breath, situate yourself within your surroundings, and understand what has led you (and others) to be here and where you should go. You can think of yourself as a *navigator* — someone who cultivates and stewards a Systems Journey over a period of time.

The journey teaches us that it is important to pay attention to our own agency and role in the systems we live and work within. Regardless of which role you're playing (whether facilitator, project manager, or simply a participant) and what entry point you're facing, *how* you navigate yourself in relationship to others will matter.

As we start **Phase 1: Engage**, we take time to become grounded. Orienting can help you and others better understand from the outset how you can most effectively *engage* and *include* the diversity of people, ideas, and information that is embedded within your system. In this step, we focus on how to cultivate personal awareness and intent (and maybe help others do the same) and orient to the systems around you.

Four ways of orienting

Orienting for a Systems Journey involves understanding the link between ourselves and others in the system. We discover our assumptions about the world and how we relate to others who may join in the journey.

There are four ways to orient:

1. **Orienting internally** involves finding out what experiences and capacities you are bringing to the journey. What assumptions do you make, and which of these can or should you challenge as you move forward?
2. **Orienting externally** prompts inquiry on the trajectory of the system you're working in. What happened in the past that is important to take forward with you? What should you leave behind?

3. **Checking your conditions** involves asking if the time is right for this journey. What conditions, resources, and structures will help enable or hinder your journey?
4. **Finding and cultivating your *core team*** invites you to reflect on who is already beside you on your journey and what capacities and experiences each person brings. Who is missing?

Depending on how much time you have and the kind of resources at your disposal - these four dimensions can be examined and described in more or less depth over the course of hours or weeks.

1. Orienting internally

> "AS YOU START TO WALK ON THE WAY, THE WAY APPEARS."
>
> RUMI

In our busy lives, we rarely have time for mindfulness. We're often forced by the structures and systems around us to rush off to fight the next fire without a moment to ask if what we're doing is really the right thing. This can lead us to operate on autopilot, imposing our own assumptions on the world rather than taking time to understand how others might see things and us, how things might actually be, and what ways of working can truly enable the change we desire. **Orienting internally** invites us to pause and reflect on our own deeper intentions so that we can show up to the journey with greater clarity and intent.

Internal orientation is about attuning yourself to your own values, beliefs, and intentions and cultivating awareness of how these shape your approach to the journey. Internal orientation also involves understanding the capacities and experiences you bring to your journey, where you are now, and where you might want to go. Exploring these things at the outset helps you to check your own biases and blind spots and to identify room for learning.

Orienting throughout the Systems Journey

Any journey we take requires re-orienting at different points along the way. As a result, the skills and tools we use to orient ourselves at the beginning of our Systems Journey will likely come in handy further down the path. Building the habit of "orienting" from the start will set you up nicely for future phases when this sort of practice is crucial.

A common criticism of the Systems Journey is that travelers get lost in complexity. With this in mind, it's important to remember that the purpose of these exercises is not to find any absolute answers or fall down too many rabbit holes, but rather to engage in the practice of assessment — not just of others and the system "out there," but of ourselves and our place within the system.

We can bound the time we take for these moments of reflection and will learn how to best use them with practice. You can start by slowly practicing the art of reflection through a regular self-check-in, maybe once a day or week, and then introduce this idea to others in group settings as it becomes more intuitive and comfortable.

How to orient internally

It is rare to be handed the time needed for deep introspection, so we must creatively find it for ourselves. While internal orientation takes practice, it can easily become a habitual part of your daily routine. Tools for internal orientation help cultivate a curious and reflective mindset and can guide us toward new insights about ourselves as individuals, organizations, or groups.

Internal orientation can be encouraged using tools like **Creative Writing** (see below, Letter to self) or mindfulness practice[1]. It can also be as simple as taking a daily walk to slow down and reflect on your intentions and how they relate to your work. If you have built up enough trust with your colleagues or collaborators, consider sharing outputs or reflections on experience informally or in a facilitated process. Beyond this, you can take time on your own to reflect on past work and activities with an inquisitive mindset. Ask yourself questions about your past and current intentions, what happened, and why. Look for evidence related to success, challenges, and missteps that could be discussed and turned into recommendations for future work. The more formal **Pause and Reflect** sessions are useful for group orientation.

Regardless of the tool or process you use and how long you spend doing this, any type of intentional internal orientation will help you start the journey with a greater awareness of your values, motivations, and hopes.

1 Mindfulness Group Practice, The Art of Systems Change, p. 128

Stories from the field

Letter to self

During a mid-point review for an organizational strategy, a team was attempting to integrate new team members while simultaneously evaluating the kinds of activities that were currently underway. Bringing on new team members in the middle of a medium-term strategy process raises a number of challenges, including bringing people up to speed on organizational history, encouraging buy-in of pre-developed strategy and activities while allowing new team members to bring fresh perspectives and energy, all while not delaying continued delivery needs.

In order to sense how people were seeing themselves, the organization, and their contributions to it, the team employed a facilitator to guide conversations. One method the facilitator introduced was a **Creative Writing** technique that involved writing a letter to yourself from your future self. Both existing team members and new members were asked to write together in silence, over a virtual platform, a short letter from their future self in 10 years. The instructions were to look back on the team's achievements, impact, and work, as well as what they valued most.

Using a creative medium encouraged participants to step out of an operational mindset and to think about the bigger picture. The letters highlighted different values, kinds of activities, how they affected change, and reflected on each individual's contribution. After the letters were read out loud, a conversation was facilitated to see how people related their future self to what was happening now in the organization.

Sharing the letters fostered empathy and understanding among the team members while allowing new members to contribute alongside long-serving members on a level playing field. The team was able to examine activities, strengthen team dynamics, and allow space to celebrate and encourage optimism.

2. Orient externally

Orienting externally involves understanding where you are at any given time. If orienting internally is like taking a few mindful breaths before a steep climb, orienting externally is like observing the height of the ascent, glancing back at the path behind you, scanning the proximity of other hikers, and checking the straps on your backpack. In this early stage, orienting externally involves simply looking around you without judgment. Systems thinking emphasizes the relational and dynamic nature of systems, which means that your surroundings may be familiar but are always unique.

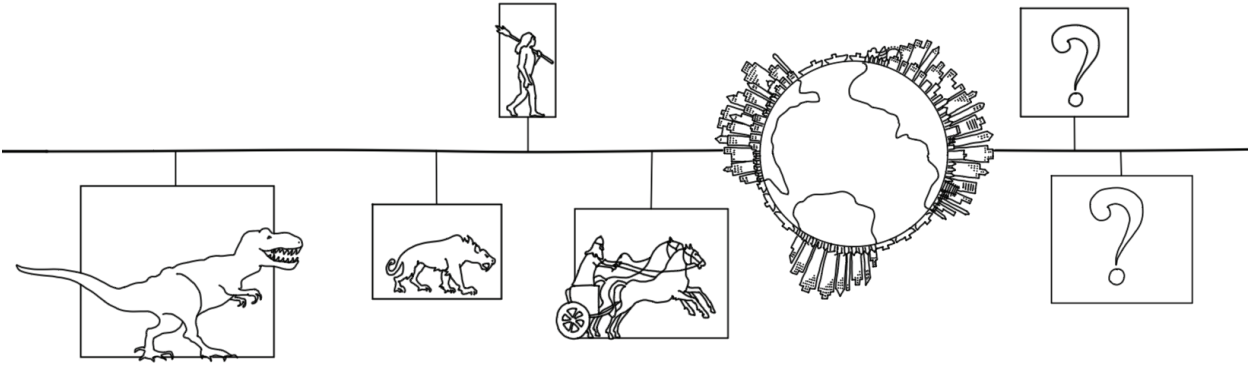
How to orient externally

Orienting externally can involve reviewing materials you already have access to, such as reports, emails, websites, guides, and past studies. You can also engage in informal conversations using *diagnostic questions* (see Introducing diagnostic questions). You might also organize your understanding using tools like the **Iceberg Model** (understanding the present) or a **Historical Timeline** (understanding the past), which can then be built upon later in the journey.

When orienting externally, it's important to remember that some information may be unspoken. Try to listen deeply and hear what is not being said. One of the best assets a navigator can bring to a journey is their own authentic self and a sense of humility. Orienting requires acknowledging what we do not know and increasing our sensitivity to things like power dynamics in relationships, organizational hierarchies, and how we as individuals show up and act in the systems we work in.

Introducing diagnostic questions

Diagnostic questions can help foster external orientation. As you ask these questions, check your reactions to the answers and process. Observing your reactions can also help you orient internally, and help you understand your own assumptions, emotional reactions, biases, or theories of how change might happen. You can work on these diagnostic questions by yourself or with a colleague or small group. Simply ask the questions, or use the tools presented in the second row to inquire with more rigor. Following are sample diagnostic questions.



Sample Diagnostic Questions

Past

- What has happened to date?
- Who has been involved so far?
- Is this similar to or building on previous initiatives?
- What is the earliest link to this that we know about?
- Was this problem framed differently in the past? By us or others?
- Who decided change was needed and when?
- What kinds of disagreements have happened in the past and how are they shaping how we work today?
- What documents should I read or what studies already exist from our organization or others?

Present

- What is the current mandate?
- What are the political agendas/communication narratives that have or might influence the work?
- What kinds of resources already exist?
- Who thinks that there is a problem that needs an intervention?
- How do you know?
- Is this problem framing open for being (re)considered?
- Has anything already been put down on paper?
- What kinds of expectations do people have of the proposed intervention?
- Are there any other reasons why we are doing this?
- Is this similar to projects already going on? How do you know?

Future

- What are the potential resources we could secure?
- What are the timeframes?
- What kinds of changes are we/you/they hoping for?
- How does this fit against existing goals for the future?
- What do we know about other people's future plans?

Using Diagnoistc Questions

Tools and methods for answering questions	**Tools** ■ Semi-structured Interviews ■ Stakeholder Mapping ■ Historical Timeline ■ Systems Mapping **Other methods** ■ One-to-one conversations ■ Rapid scientific literature review ■ Document review (project work plans or proposals, strategies, donor reports) ■ Workshop sessions ■ Online or print surveys
Considerations for how you answer questions	■ Conversations or meetings may be face-to-face or virtual. In-person conversations allow for more trust and relationship-building, while virtual meetings can engage a broader group of people. ■ Responses can be anonymous or attributed. If situations are tense or conflicted, anonymized responses may be more effective in distilling useful information. ■ Input can be collected in real-time or delayed (for example, inputs via a survey or email versus in a meeting). Delayed response can allow for more thought while gathering information in real-time can help build relationships and trust, and foster dialogue.

You don't always need complicated tools to orient externally. If you are already experienced in tools that can help answer these questions (such as scientific interview methods or computer-based tools) then these might be the fastest. Or simply take a piece of paper or audio recorder and write, draw, or verbally explain a diagnosis.

Stakeholder Mapping can help to understand who is in your system. You can question how they might be connected to each other and to you, their different interests and motivations, their ideas or ideologies, and the possible expectations stakeholders have of you. During this phase, such an exercise does not need to be comprehensive. Even a light-touch version can help you start a journey with a better understanding of the power dynamics and

relationships that will undoubtedly shape the path ahead. Outputs and insights from such an exercise can be used to inform specific activities related to managing risk, communication, influencing, co-creation, setting the boundaries of the system you will work in, as well as the skills needed in your broader work. It could also surface non-traditional actors or parts of your network that might be relevant, and be built out with others in later parts of your journey.

3. Check your conditions

> "SURELY, THERE'S STRENGTH IN BEING DRESSED FOR A STORM, EVEN WHEN THERE'S NO STORM IN SIGHT?"
>
> YAA GYASI

Embarking on a Systems Journey involves stepping into uncharted territory. While the conditions are never "just right," the timing of the work matters. And we never start from scratch: all systems carry legacies, as do efforts to change them. Understanding the conditions you face can help you find easy wins so you can take advantage of being in the right place at the right time and spot red flags that indicate the change may be difficult or impossible. One theory suggests that change happens when the "function" of five enabling conditions outweighs the resistance to change (Beckhard and Harris, 1987). These conditions are:

1. The belief that change is possible
2. Sufficient dissatisfaction with the current state

3. Clear and agreed-on goals
4. Awareness of the first steps
5. The right connections to get there

The conditions to which you orient are not just those internal to you or your organization(s). You should also orient to the broader conditions in the systems you work within (for example, a community, sector, politics, wider region, or set of collaborators).

Not every Systems Journey takes 100 years!

Sometimes the answer to our most complex problems is hiding right under our noses. Taking the time to orient ourselves can often help us spot innovative and effective solutions before we even begin to build a coalition for change.

For example, a national government was interested in developing a new five-year management plan to improve the country's national park system, which was designed to help protect migratory birds. To kickstart this effort, the government staff worked with a facilitator to convene managers from a number of national parks across the region for a workshop to begin the strategy-planning process.

As part of the workshop, the facilitator and participants went on a *learning journey* (see **Semi-structured Interviews**) where they drove around one national park to orient externally and check their conditions. The facilitator, who was an outsider to the group, asked participants how migratory birds could survive in the park without water, noting the dryness of the surrounding landscape. This led to a discussion about a longstanding conflict about irrigation with neighboring farmers, which the park managers had given up hope in resolving. By asking a series of questions about the situation (see "The Five Whys," **Iceberg Model,** p. 185) the facilitator probed opportunities to work with the farmers to reroute their irrigation systems, which could rapidly and drastically improve the health of the national park.

For a long time, the park managers had assumed that there was no solution to the water crisis in the park. By revisiting the issue while orienting themselves to the journey, they realized that setting aside their own biases about what was possible was the key finding to a new pathway for change!

Stories from the field

Check your conditions

Use these probing questions to help check common conditions when you begin a journey. Some of these conditions are more operational in nature, while others are conditions of the system.

Condition	Probing questions	Example
Human capacity	What's the capacity of your immediate team? How much time can people devote to understanding and working with the system? What about your partners? Others in the system?	"My program is staffed by me (at 50%) and one other person (at 15%). We're working on funds to get partners formally involved and to hire a full-time program support officer. We clearly have limited capacity, so will lean on lighter-touch tools as we go forward (like one-on-one calls and emails with key stakeholders) and will fundraise for resources to ensure that, down the line, we can engage the system more deliberately."
Funding	What resources do you have now to put into a process? What resources will you have in the future to support and sustain a change process?	"We are working with a start-up grant that has some flexibility. This could be really helpful for us in doing some good systems exploration upfront. When new RFPs open next year, I hope that whatever we do now can help us better understand the themes we should be fundraising for, and more importantly, who we should be fundraising with, especially as the new funding will likely have less flexibility around what activities we can implement"
Time	What scope of change are you trying to create? One that will last a generation? 10 years? A cycle of government?	"I work on government relations, so I am used to thinking about our work in time blocks that align with government turnover. But really the change I want to make should last a lifetime. I wonder if I should broaden my time horizon a bit. I might start by doing a simple exercise (inspired by **Creative Writing**) by myself, imagining what myself in 10 years might say to the current me."

Condition	Probing questions	Example
Level of resistance in the system	Is there resistance or willingness internally in your organization? Within your network of partners? From others in the system who are key levers of change?	"In meetings with my colleagues, I tried to subtly probe why we haven't worked with smaller social-justice organizations on climate justice. I also asked around at a recent conference I attended. I'm starting to understand that there might be different types of resistance out there. There are people who truly feel that environmental protection must happen at any cost, and social issues are secondary, while others fear failing and are overwhelmed with the idea of pushing their already stretched mandates to include issues of social justice."
Complexity of the system	Is your problem complicated or complex? Is there a technical solution that will fix it or do you need a more adaptive approach?	"We have been working on supporting national protected areas for years and know what it takes to make these things work. But actually, we've been having a lot of issues lately with illegal harvesting, with COVID-19 driving more people back to their homes. This really is a complex problem. As we move into our new phase of work, we might need to invest more time and resources into listening to others' perspectives on the problem and to reduce our investment in technical analyses of the problem and possible solution."
Actors in the system	How many different perspectives of the problem exist in your system? Are there power imbalances that will prevent shared, agreed-upon values from emerging? What do current connections between actors look like? How do you understand power and relationships?	"Our strategy centers on community-based conservation, so there are many perspectives to consider. The relationships between different groups are messy and always changing — it's a bit overwhelming to try to track them all. This is going to be something we need to think about on our Systems Journey: how to keep a finger on the pulse of changing power relationships on all levels without getting lost in the complexity. We must remember that the easy tools we use now to understand stakeholders can help us keep checking in on this issue as we move along."

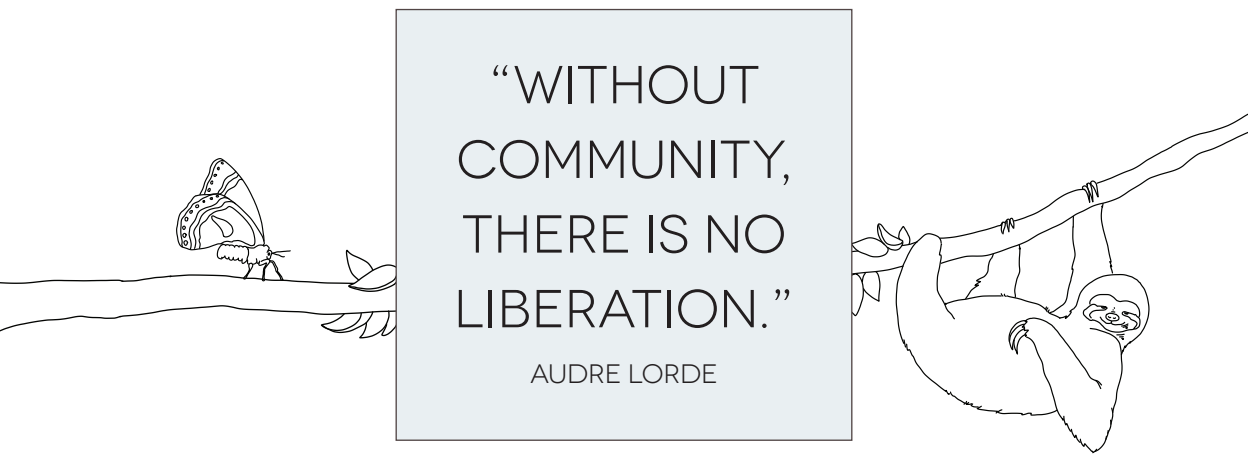
Table 2: Check your conditions

How to check your conditions

There are a number of conditions to check before starting a Systems Journey (for examples see above, Table 2). The current state, configuration, and trajectory of these conditions will help you determine what kind of journey is possible, and if you and your team are the right fit for the challenge. Some of these are more operational in nature (for example, the resources, capacities, and funding at your disposal), while others are more fundamental to the system itself (level of resistance to change, degree of complexity, and how these two intersect). You can get a pulse on these issues through simple diagnostic questions (Table 2) as you will continue to explore these later in Phase 1, and in **Phase 2: Explore**.

Checking the conditions may involve answering the hard question of whether or not it's safe or wise to begin a Systems Journey (see When to use (or not to use) this guide, p. 14). Be mindful of red flags related to risk, trust, politics, your own motivations, and key constraints in funding, agency, or people's attitudes. Based on what you've learned so far, will your role in the system be perceived as *credible and legitimate* by others in the system? Once you begin working on a topic or issue it becomes increasingly difficult to reassess your role in that topic or issue (often referred to as a "stability bias," see Lovallo and Sibony, 2010) As a result, be sure to reflect carefully on whether it makes sense to continue before you venture too far out on a journey.

4. Find and cultivate your core team



All Systems Journeys require companions. Here, we refer to our companions as our *core team*. A *core team* is your group of allies and close companions, with whom you work closely on your Systems Journey. Your core team forms a unified, networked whole that shepherds a change process forward. Your core team, while networked, is fluid. Finding your core team might involve leveraging existing relationships and networks or seeking new connections and building from there. Creating true systems change often requires us to push the bounds of our job descriptions. Thus, finding and cultivating your core team requires understanding the diverse capacities and functions needed on the team in order to effectively tackle the Systems Journey.

Why find and cultivate your core team?

Systemic change rarely happens because of one person's actions. Even when it looks like this is the case, more often behind that one person is an ecosystem of diverse others who, together, facilitate change. We need our community to create change. So it's important to think about which capacities and functions represent the diversity of your system and enable change to happen in your system's unique context.

Each team member brings different strengths and weaknesses to a collaboration. Orienting internally helps us uncover these individual capacities, and finding and cultivating our core team requires that we engage others who can complement our strengths and offer new and unique perspectives to the task at hand.

Anyone familiar with the realities of institutions and organizations knows how important it is to create the structures and processes to facilitate good work to continue in case a colleague or collaborator leaves or retires. We know that individual relationships are often at the heart of lasting change, so creating a diverse group (for example, a mix of career stages and lengths of time at the organization) can help build resilience in your core team, even as individuals come and go.

How to find and cultivate the core team

It is important to look beyond job titles and to see what an individual can bring to your core team. There are many kinds of functions or roles that go well beyond what someone is formally hired to do. If possible, consider who beyond your institution might also fill these core functions. From your previous efforts to orient to your surroundings and check the conditions, you will likely have come across people within the system who would make good allies. Importantly, they might also be people who are not like you — they will bring ideas from differing positions that challenge you and help you grow, as well as ensure that many worldviews and ways of thinking are at the table.

Your core team and a facilitator

One of the most frequently asked questions when working on a Systems Journey is, "Should we hire a facilitator?" The answer most often is, "It depends, but probably at some point."

A navigator often plays the dual role of navigating and facilitating at different points on a journey. For this reason, we have included "tips for facilitators" throughout this guide. Sometimes navigators need to be fully present in the act of creating systems change, and at moments like these, it helps to have an external facilitator. An external facilitator can serve as a friendly guide, working adjacently to and guiding your core team, and periodically stepping in to help steer critical moments in the journey (similar to the role of a *developmental evaluator,* see Patton, 2010). Facilitation is a critical skill for fostering systems change, and it helps to have a facilitator well-versed and embedded in the philosophy of systems thinking.

Budgets often don't allow for a friendly guide for an entire journey, but don't let this stop you! You can cultivate your own capacity to facilitate a systems journey by taking one step at a time and asking for help when you need it. It would also be helpful to have several people within the core team who can serve as facilitators at different times. This allows teams to share the burden of shepherding the journey forward and helps build empathy between teammates.

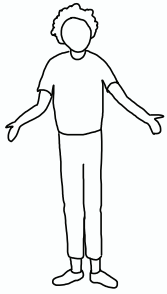
When gathering your core team, consider the different functions required; for example, who could act as innovators, teachers, mediators, agitators, or orchestrators (see Functions within a core team, Table 3). You might also see yourself in these other roles, which may lead you to realize you need a co-navigator or that you might not want to be a navigator at all. Being a true leader requires humility and self-reflection - this helps you better recognize the different strengths and capacities in yourself and others around you.

Looking beyond job titles can be a powerful way to harness the capacities required beyond how we are used to working. There are no perfect teams, but encouraging everyone to see themselves and their role in the system and in the journey you are trying to foster will help to embed an awareness of our own contribution to creating change.

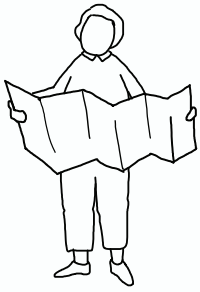
Functions within a core team

This table is designed to help you think about what capacities may be useful to you as you begin your journey. The roles listed may or may not overlap or be held by more than one person, and different roles (or combinations of roles) may be needed for various contexts.

Innovators*
An *Innovator* might have new, big ideas, have kicked off the whole process, or is the "keeper of the vision." They might be heard saying, "Let's change the world" and typically find ways to change the structures around them, bringing in new resources, motivating the team, and offering reminders of the bigger picture. They help sell the vision and progress of the journey to those needed for support. In their job, they might be a leader of a program or initiative.



Mediators
Mediators have a good intersection of general, topical knowledge, as well as the ability to run workshops, design conversations, and move processes forward. You'll know them by their ability to put out fires and pivot quickly. They might also be skilled at workshop facilitation and managing long-term relationships. For their job, they might be a project manager, or a strategy or proposal developer.



Orchestrators*
Orchestrators look for the bigger picture and see connections everywhere. They like and are at their best when they are nimbly facilitating new flows of information, setting up introductions, promoting outputs, and understanding what rules must be followed, bent, or done away with. They think deeply and their advice and actions will likely help cultivate strong and lasting working relationships. Orchestrators know which people should be considered in the co-creation process and are one step ahead, smoothing the way for implementation. You might hear them asking, "Have you heard about…?" to the right people at the right times. They might be generalists by training but highly networked across diverse sectors, expertise, and geographies.

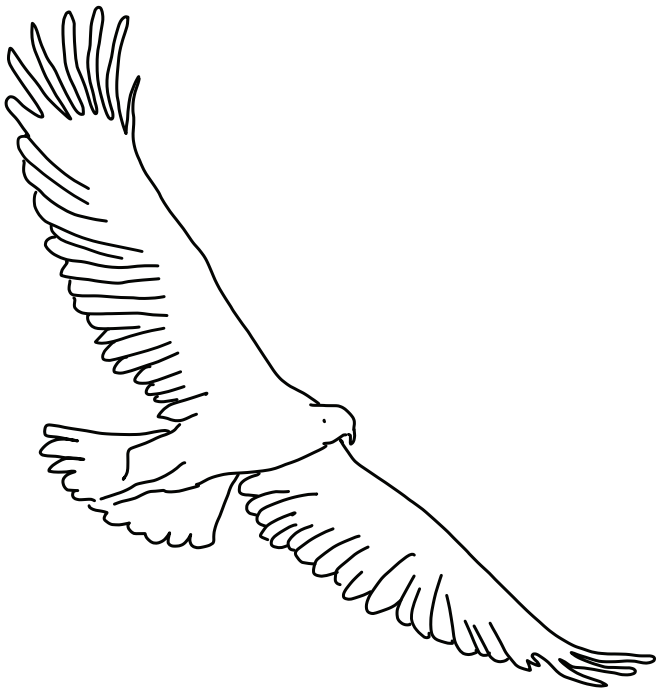
	**Navigators** *Navigators* typically act as guides, custodians, or stewards for the long-term Systems Journey and its processes. They ensure the core team and key collaborators can collectively band together to work toward change. They bring a more specific focus to and advice on what systems tools and practices matter and when, and are excited by what systems practice and thinking offer in making a journey real. They might also take on other roles (both ones in this table and others) at different points in a change process.
	**Teachers** Deeply knowledgeable in systems thinking and practice, *teachers* actively encourage others around them to consider a new way of working and thinking. They may even be able to support capacity development, offer inspiration and support, and provide advice to the other core team members on more complex aspects of how this works. They're generous with their knowledge and can often be heard saying, "What about…" while pointing the core team to new resources, offering new ways to think about problems and solutions, and keeping everyone confident that they can do this.
	**Agitators*** *Agitators* like to shake things up. They tend to use their critical thinking skills to push those around them (and themselves) to "do better" and check their biases. An agitator might play devil's advocate or point out problems and stumbling blocks in a change process, creating opportunities for the inner circle to pause, reflect, and reorient. While agitators are good at creating change, they are also empathetic and good team players — they know when to push, and also when not to.

Table 3: Functions within a core team
**Categories adapted from Battilana and Kimsey, 2017*

Reaching "good enough" when orienting to the Systems Journey

The goal of orienting in these four ways is to gain as much information about yourself, your entry point, and the community and conditions that surround you. Often, orientation must be done rapidly and with limited information, so we must be satisfied with an orientation that is "good enough" to enable your team to move forward. You will know that you have oriented "enough" when a clear next step emerges for moving forward to Step B: Understanding the System. By now, you will ideally have an initial community of people surrounding you and a sense of who you might invite onto the journey as you begin. You might also be working with externally-driven deadlines and windows of opportunity (such as a funding pitch or political event), which could serve as a forcing mechanism for you to move on to the next phase.

Many of the steps and tools introduced in this chapter can be repeated throughout your journey, either by you as an individual or together with others, to encourage mindfulness and reflection. Once you have cultivated a heightened awareness about yourself, your surroundings, and your system, you are ready to take your first steps.



SUMMARY

FAQs

- **What do I do with all the messy stuff that I uncovered while orienting?**

  Remember that orienting yourself is only the first step of Phase 1. All the insights you uncover and artifacts you create will be instrumental as you embark upon your journey. Keep these with you and remember that all phases of a Systems Journey are iterative. You will likely build on insights you uncovered here, most likely using some of the same tools again and again throughout your journey.

- **Based on what I learned while orienting, how do I know if I should proceed with the Systems Journey?**

  Making a decision about whether to take a journey is not an easy one! Using the tools and mindset from this chapter, you can gather information and insights from others that will help you make an educated and wise decision. Remember: look for red flags (see When to use (or not use) this guide, p. 14), trust your gut, and know that, often, no decision is still a decision!

- **How do I know when I have engaged enough stakeholders in orienting?**

  Returning to questions like, "Who holds or lacks power in this situation?" is always a good way to assess which stakeholders are important to engage in a systems-change process. This phase is really about setting up your journey, so you don't have to worry too much about perfect stakeholder engagement. In the next step, when you start understanding the system (p. 59) with others, it becomes critical to ensure that, as you proceed, you invite stakeholders who represent different perspectives of the system to take part in your journey. In this phase, understanding who you might need to engage along your journey and keeping that intention front-of-mind is most important.

Tools referenced in this chapter

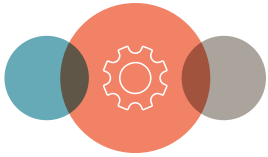
- **Creative Writing**
- **Iceberg Model**
- **Pause and Reflect**
- **Semi-structured Interviews**
- **Stakeholder Mapping**

Boxes in this chapter

- Orienting throughout the Systems Journey
- Letter to self
- Not every Systems Journey takes 100 years!
- Your core team and a facilitator

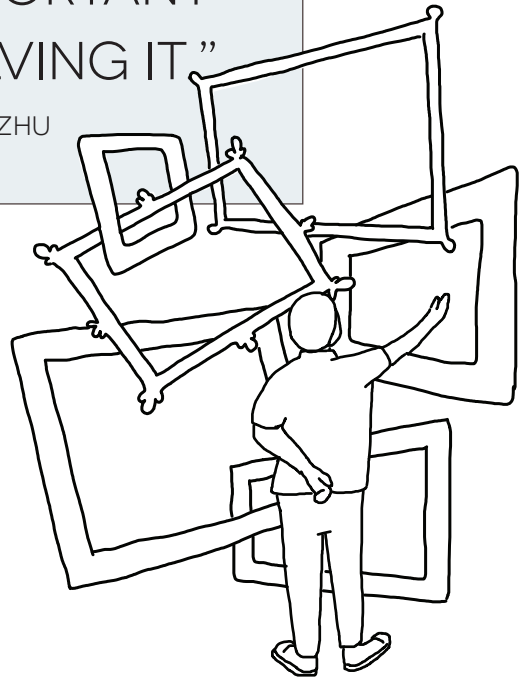
Tables in this chapter

- Table 1: Introducing diagnostic questions
- Table 2: Check your conditions
- Table 3: Functions within a core team



Step B: Understanding the system

> "FRAMING THE RIGHT PROBLEM IS EQUALLY OR EVEN MORE IMPORTANT THAN SOLVING IT."
>
> PEARL ZHU



OVERVIEW

Overview

- Taking time to understand a system and define problems with others is one of the best ways to engage other actors in the system and ensure that problems aren't framed by a perspective that is too narrow to create transformational change.
- As you gain understanding, check that you have engaged as much of the system as you can, including actors who may think and act differently from you. Try to ensure that at least a third of the participants you engage in this phase are people you wouldn't normally connect or work with.
- Understanding the system involves iterating between clarifying your and others' intents and perceived problems on the journey, and using basic systems-thinking concepts (like causal relationships, feedback loops, and system archetypes) to understand how the system generates the problems we perceive.
- Your understanding of the system will continue to evolve as you move through the journey. Getting to "good enough" requires that you have a shared sense of (1) the problem (via a problem statement), (2) who is impacted by the problem and why it's important, (3) the problem's history, (4) the dynamics that underpin the problem, (5) a sense of how you might bound the system that generates the problem going forward, and (6) knowledge of where there is disagreement on or tension around the problem.

Common outputs from this phase:

- A draft problem statement
- A narrative that distills assumptions, unknowns, and available evidence as to why this is a problem
- A visual or graphic representation of the problem and the system
- Set of interviews or other data
- Map or list of key stakeholders
- Photographs, art, or drawings from workshop sessions

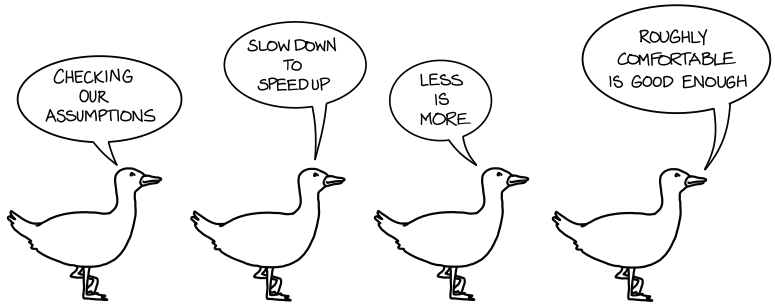
Common capacities cultivated in this phase:

- Enriched capacity to work within your core team and with system actors
- Increased comfort with working under conditions of uncertainty
- Capacity to recognize common system features like feedback loops and archetypes

Teams often rush to define a problem and then jump to solutions before truly understanding the system (or really, the many *systems*) that create the problems they perceive. This can happen due to external pressures, such as fundraising, securing jobs, or political pressure; or internal pressures like social norms, individual beliefs, and personal values. However, it is not always easy to see — let alone agree on — the root causes of a problem. Often, the events or problems we perceive are just the tip of the metaphorical iceberg (see Iceberg Model, p. 185) and are actually symptoms of deeper issues stemming from how we think and act in society. A problem from one person's point of view might be something positive from another's perspective. We all interpret the world in different ways depending on our histories, our values, where we live, and how we've been trained to understand the world.

As defined by environmental scientist Donella Meadows, a *system* is a set of things — people, cells, molecules, or anything — interconnected in such a way that they produce their own pattern of behavior over time. A system is more than the sum of its parts: its elements are organized in a way that achieves something. We are surrounded by many overlapping and interrelated systems; thus, as we move to the second half of Phase 1 into **Step B: Understanding the system**, we slow down to explore the complexities around us with others. Understanding the systems we live and work in together with others can help us better see ourselves in the system, explore the dynamics that we live and work in, and understand how others might perceive and experience these very same systems.

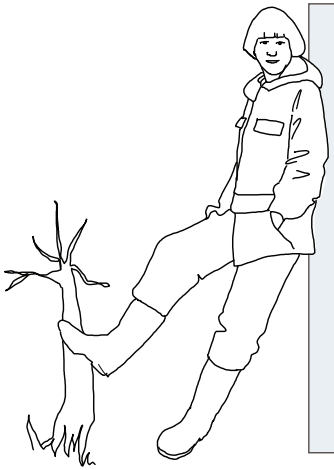
Defining the problem and understanding the system



Defining a problem is the foundation for action. How you define a problem will shape grant proposals, work plans, and communication with partners. These in turn shape the solutions identified and advocated for, how you evaluate your effectiveness, and of course, the lives of those impacted by your work. Defining the problem poorly can lead to wasted resources and broken relationships, which could make the original situation even worse.

We begin a Systems Journey by agreeing on a rough *problem statement*: the answer to the question, "Why are we all here?" As we try to understand the patterns of change, relationships, interconnections, and beliefs ("the system") that underpin this problem, we may find that the original problem we identified might not be what we thought. Thus, the process of defining a problem and understanding the system is iterative — a problem statement may change over time as we learn more about our system.

Who should be part of this step?



> "WHO DEFINES THE PROBLEM SHAPES THE SOLUTION."
>
> DONELLA MEADOWS

When we invite people into a process to define a problem and understand a system, we set in place two key enabling conditions for systems change:

First, we broaden our perspectives. People with different perspectives and histories are part of the places, institutions, and contexts of any problem or situation we perceive. They will be able to share their perspectives on how the system was, is, and what they hope it could be. Bringing in people with opposing views or from outside (whether this is an organization, place, or sector) also allows us to challenge views on what the problem is, test our own biases, and see dynamics differently. No one person or organization has complete knowledge and understanding of a complex system. By having different people co-create this understanding, you'll have a better handle on the primary problem(s) you might want to collectively address.

Second, we start the process of creating change. Bringing people together can set a change process in motion. Sometimes, the act of showing up in a place or system can be an intervention in itself. Engagement of diverse voices might result in different choices and practices when people meet each other out in the real world in the future. As you think about with whom to frame your problem, think about who has knowledge of the system, who holds power, who is vulnerable, who has agency, and who doesn't, and ensure you create space for diverse perspectives and views across demographics, cultures, and genders.

Identifying whom to invite onto a journey is no easy task, and there is no perfect way to do it. Turning to trusted colleagues, collaborators, or advisors and working through your extended networks is a great, quick way to start. However, recognize the biases that may shape these networks and develop a plan for how you might engage people outside of your usual circles.

One tool to employ in deciding whom to invite into the process is a **Stakeholder Mapping** exercise (for an example, see Mapping stakeholders, power, and relationships, p. 65), building on any efforts you began in Step A: Orienting yourself as a navigator. The visual artifacts created with tools like this can also allow for reflection on who should be engaged later in the journey, especially as the system and people's roles in it change over time. Stakeholder maps or even lists (see below, Even a list will do) can be valuable resources for future decisions, like who to include in grant proposals or research processes.

Even a list will do!

Stakeholder Mapping can seem complex and difficult to master if you are new to a systems journey. If you aren't ready to dive into mapping, even a simple list will do. Try creating a spreadsheet to help track stakeholders you may wish to engage in a journey. Some sample column headers could include an individual's name, organization, contact information, the rationale (why are they important to the journey?), expertise, geographic region, gender (or another demographic marker relevant to your journey), and notes on current relationships (e.g. former collaborator vs new contact). A good rule when you're beginning a journey is to ensure that at least a third of the participants are from outside of your typical circles of collaborators.

Over time, the document can be updated as you gain more information on the different stakeholders you may wish to engage, or as relationships evolve and grow. As with most tools, they are most useful when they are used, so if a simple list works best, you have already mastered one tool for creating systems change!

Facilitator's tip: Using silent conversations

The silent conversation is a facilitation technique in which participants are asked to write short statements in response to a facilitator's probing question. These aim to slow the pace of thinking and encourage deeper individual reflection and listening.This technique is particularly useful when there are people holding different levels of power in a room, as the technique can help give more voice to those who tend to be quieter or who have less power.

To facilitate a silent conversation:

- Find a large wall or flat table space and pass around sticky notes or cards with large pens.
- Allow participants to spend time individually writing down very short statements about the problem or parts of the problem (maybe 5–10 minutes).
- Then ask them to place the notes on the wall or in the space randomly.
- Once the notes/cards are placed, anyone can begin to group together the statements, still not talking.
- The group watches and anyone who wants to join in can also start grouping notes.
- Without speaking, participants can change groupings or move problem components from one group to another, silently "challenging" or "contesting" others' placements.
- Continue until very few changes are made.

Following this exercise, the facilitator can then help the group through a respectful conversation about the groupings and support dialogue on mapping the various distinct or divergent parts of the problem.

Finally, consider power and politics. Engaging those who have strong or polarizing opinions can be critical to fully understanding the system, though their involvement may impact other participants (positively or negatively). Similarly, leaving out actors who are not perceived as central by your stakeholders could further isolate groups within the system. Anytime you convene stakeholders, remember that relationships are likely shaped by both subtle and overt power dynamics and histories. It is especially important to consider how factors like history, language, race, gender, and culture might shape who has and who lacks power, and who feels comfortable speaking up in collaborative settings. Take time to support participants individually and cultivate a shared understanding as to why you are trying to understand the system. Facilitate in a way that is mindful of these power imbalances (using techniques like *silent conversations*. Understanding controversial opinions throughout a journey is an important step in identifying why problems persist, but it's important to do this carefully without causing harm to others. Most problems we try to solve have no single

correct framing or subsequent answer. There will be trade-offs that you as a navigator or facilitator will need to work through, and "good enough" choices will need to be made that likely flow from compromises between different sets of stakeholders.

Mapping stakeholders, power, and relationships

A consortium of partners from four countries came together to identify ways to collaboratively and sustainably manage forests for both people and nature. To better understand who needed to be involved in their initiative, the consortium used **Stakeholder Mapping** to better understand the relationships and power dynamics between actors in their system.

During the exercise, participants were asked to form small groups and were given large pieces of paper to document the exercise. To start, groups wrote the name of the project in the center of the paper and were then asked to write the names of key stakeholders involved in or related to the project. As they added new stakeholders to the map, they discussed the *theory of change* they wanted to catalyze and how different stakeholders in the system could achieve that. Their discussions focused on how they thought stakeholders would act, which of the stakeholders had the power to act, and how this related to the stakeholder's interests.

After drawing maps in small groups, participants reviewed each other's maps to see how others perceived the relationships between stakeholders in different countries, and how these relationships were connected to the fundamental challenge they were trying to solve. This helped participants better understand why different interventions for managing forests were needed in different contexts. The process of reviewing each other's maps also helped to foster empathy between those who had previously disagreed about what the "right" solution should be. It also showed that there were different leverage points in each geography, as well as practical implications around timelines, differences in political systems, and budgeting needs in each context.

How to understand the system?

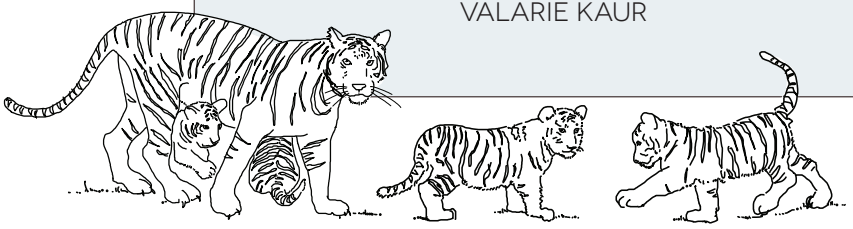
Understanding the system involves three steps:

1. Clarifying intent and initial problem definition
2. Exploring the system underpinning the problem
3. Iterating between the two, and reaching "good enough"

Depending on the scale, scope, and context of your situation, these steps might be completed informally in a few days or weeks, or be developed carefully over longer periods of time with many stakeholders.

1. Clarify intent and initial problem statement

> "DEEP LISTENING IS AN ACT OF SURRENDER. WE RISK BEING CHANGED BY WHAT WE HEAR."
>
> VALARIE KAUR



Similar to when orienting yourself to the journey, it's helpful to pause and reflect on why participants have made the decision to join part or all of the journey, be it via an initial call, meeting, or workshop. By clarifying the different intentions that have brought each person to the journey, everyone can come together more honestly, recognizing where shared goals exist and also where they differ. Like all phases of a Systems Journey, clarifying intent can happen in a variety of ways, such as informal one-to-one conversations, individually-focused exercises like **Creative Writing**, and individual or group discussions via **Semi-structured interviews.**

Keep in mind that the ways people describe, understand, and explore situations vary with things like culture, language, and preferred learning style. Attuning to the four ways of talking and listening (see p. 70) can help us be better listeners, which can, over time, help us to better attune to others' intentions when creating change together.

Clarifying individual and shared intents inevitably leads to exploring the shared challenge or problem you may be trying to solve together. Often the most challenging part of defining the problem is knowing where and how to start. Prior to working with system actors, the navigator might have already developed useful inputs to guide this phase. These could include (but are not limited to):

- Initial problem statement
- Draft descriptions of social and professional networks
- Different types of evidence related to the situation
- Information on available funding
- Other initiatives related to the situation
- Organizational directives or policies

As navigators or members of a core team, we may have an initial idea about what the problem is, but it's important to remember that other participants might perceive the problem and the system generating it in very different ways depending on their values, experiences, and goals. Asking questions that encourage deeper dialogue and reflection can help us reach an initial problem statement. A *problem statement* is typically formed as a single sentence or statement that will guide you as you move along your Systems Journey. A problem statement is never final and often evolves over the course of a journey.

You can ask participants to do this individually by using **Creative Writing** to reflect on why they have joined you or bi-laterally using **Semi-structured interviews** (see Understanding the system with Semi-structured Interviews, p. 69). To take a group approach, use the **Iceberg Model**, which prompts discussion around the patterns, structures, and mental models that sit below the problems we perceive.

It helps to prove the different political, social, cultural, economic, and ecological systems within which we are embedded and work since these interact and produce patterns of behavior and structures. Likewise, some actors will know some systems better than others. Having these discussions early on can help a group find a consensus on a "good enough" problem statement to start.

At this point, you might begin to uncover areas of both consensus and divergence around what the problem is. Some people may share your problem definition, while others might be interested in joining a journey to advocate for their separate but related goals. Try to make space for both of these. In this early phase, managing the dynamics between stakeholders in group settings is important for ensuring power imbalances are navigated so that marginalized voices are heard, and that there is space to build trust. This could happen in traditional workshop settings or might be cultivated over time in more informal quiet and meetings. These dialogues, be they virtual or in-person meetings, must be facilitated with care.

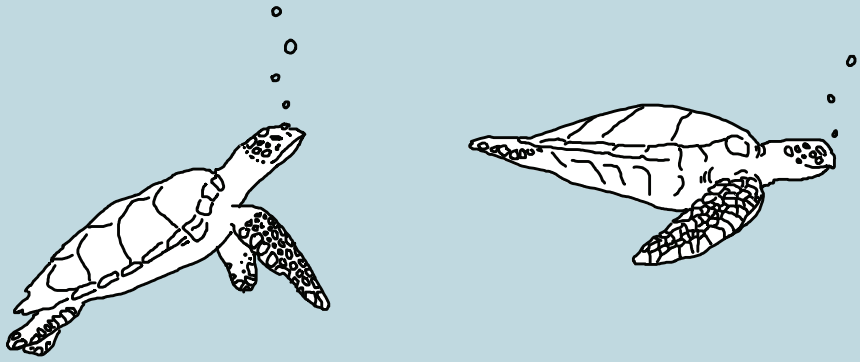
At this initial stage, getting to a rough problem statement is good enough (for an example, see below,What does a good problem statement look like). At this stage, a problem statement only needs to serve as a useful anchor to dive deeper into understanding the system. Make sure that the problem statement you agree on at the end of this step reflects the rich discussions you may have had with participants and that it also reflects the principle of time and scale (Principle 4).

What does a good problem statement look like?

A conservation NGO had been working on safeguarding coastal habitats for years. With climate change becoming an increasingly important topic, a new project was planned that emphasized the importance of coastal mangrove habitats for mitigating and adapting to climate change. While the initial problem statement focused on climate change, probing the "why" helped the team interrogate the different dimensions of the problem that they knew they would need to keep in mind as they prioritized their activities and investments in learning and evaluation. The problem statements were disaggregated into a series of problem statements that different stakeholders valued (see below). These more specific problem statements helped the planning team keep in mind the different values they had to consider as they prioritized which actions they needed to take to address the many roots of the problem. They also helped in identifying learning questions and indicators that would help them learn their way forward.

Problem statements:

- Capacity for enforcing rules and regulations for mangrove management has been declining over the last 20 years.
- Government agencies are not well set up to govern mangrove forests, as the rights to manage mangroves are distributed across many agencies.
- Mangrove forest cover and the quality of mangrove habitat have both been declining, threatening vulnerable coastal communities, who are at increased risk due to food insecurity and increasing numbers of storms and rising water levels due to climate change.



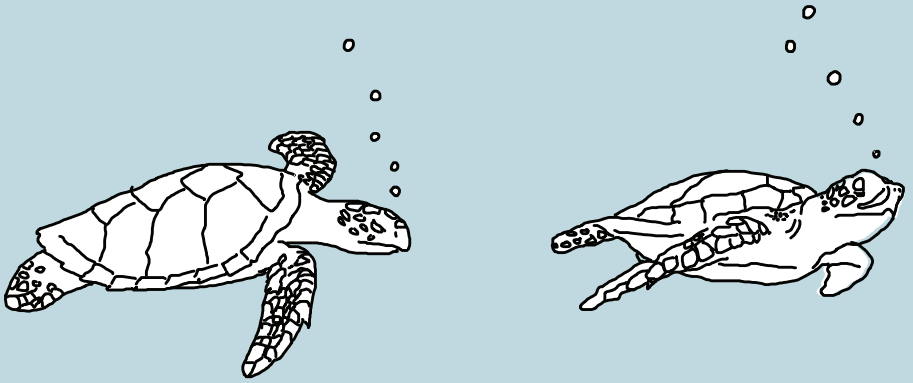
Understanding the system with Semi-structured Interviews

An NGO was interested in understanding how food waste could be reduced in large supply chains to inform a new strategy on global food waste. The NGO convened a range of stakeholders for a virtual workshop. To help understand the system, participants used **Semi-structured Interviews** to gain insights from external experts on which opportunities they saw as being critical for reducing food waste.

Experts were identified for interviews through the informal social and professional networks of the workshop participants and were chosen to represent different parts of the supply chain, which included, for example, farmers, wholesalers, representatives from logistics companies, and retailers. Workshop participants developed and followed the same set of 12 questions to guide each interview. Each interview was conducted via Zoom, with a small group of interviewers (2–3) asking questions of a single expert. Since each expert had a different perspective of the supply chains, the questions served as a loose guide to inform a more informal conversation, allowing the conversations to flow naturally to the interviewee's area of expertise.

A common theme on the current importance of "buffers" in the supply chain emerged across the interviews. Experts all shared in their own way how important it was to ensure they had more food than required at different points in the supply chain to secure either future contracts with wholesalers or suppliers, or to meet consumer and customer demand. In a number of places, these "buffers" commonly led to significant food waste in the supply chain.

While the original intent of the exercise was to better understand the system, the process of conducting Semi-structured Interviews also helped to uncover a potential leverage point that the group explored later in the strategy-development process. In this case, integrating multiple perspectives on the same problem led to the emergence of a new insight that helped both the workshop participants and expert interviewees continue to learn their way forward.



Facilitator's tip: Four ways of talking and listening

Scharmer (2007) identifies four distinct conversational modes that groups enter: downloading, debating, reflective dialogue, and presencing (or "generative dialogue"). These categories help us understand how we communicate within and between groups.

Downloading: the listener responds by saying what is expected and polite. A good example is saying "yes" when asked if you understand, even if you do not. This is almost an automatic process in which "we merely repeat the story that's already in our heads, like downloading a file from the Internet without making any change to it" (Kahane, 2004).

Debating: the listener is judging whether they agree with the speaker. They are actively seeking out facts that run counter to their own narrative. Different perspectives and a variety of options can be generated in this conversational mode. The speaker will embody a general willingness to challenge the ideas within the group and feel empowered to speak their mind.

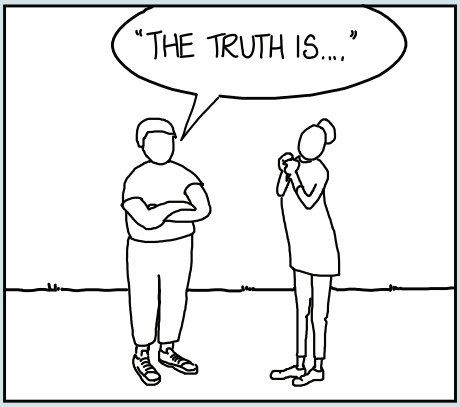
Reflective Dialogue: listening and speaking from a place of empathy and self-reflection. Kahane (2004) believes this conversational mode is "the root of the potential for change and creativity." The listener is trying to understand where the speaker is coming from, while the speaker is trying to communicate authentically to the best of their ability.

Presencing: a moment of deep, shared understanding of the group's higher purpose. This conversation mode requires the full presence of the group to unlock a state of "flow" wherein presencing makes space for "welcoming the new and transforming the old."

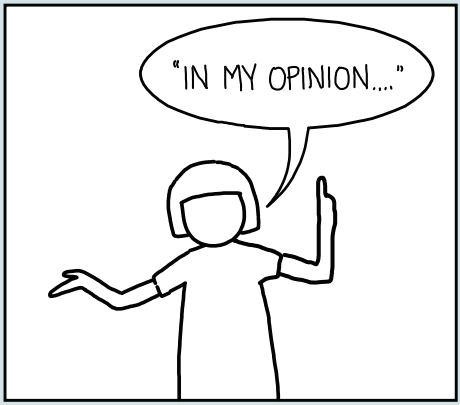
Kahane (2004) argues that if you want to solve complex problems and effect systemic change, you need the "awareness of these different ways of talking and listening and the capacity to move among them." Cultivating both the capacity to recognize the modes and move between them can help strengthen the quality of conversations that you and others in your system have with one another. Being stuck in one mode can severely limit a group's effectiveness.

When facilitating discussions, *sentence starters* can be used to explore the *four modes* (also known as the four different ways of talking and listening), both to build awareness of what mode you or others may be in and how to shift from one to another. They can also be practiced on your own.

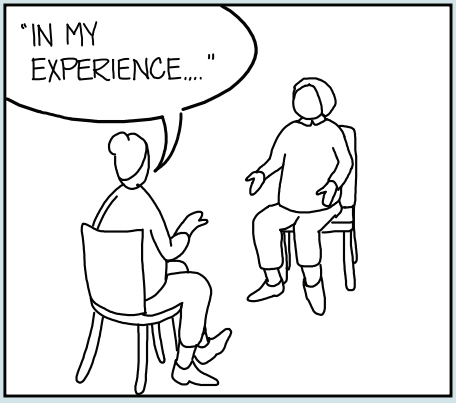
- Downloading: "The truth is..."
- Debating: "In my opinion..."
- Dialoguing: "In my experience..."
- Presencing: "What I am noticing here and now is..."



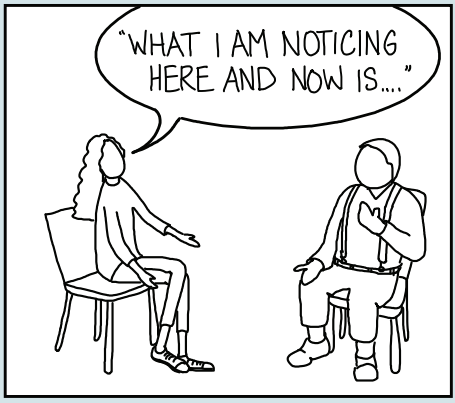
DOWNLOADING



DEBATING



DIALOGUING



PRESENCING

2. Explore the systems that create the problem

Once we have an initial problem statement, it's time to explore the system. Earlier, a system was defined as a set of people, cells, molecules, or anything interconnected in such a way that they produce their own pattern of behavior over time. A system is more than the sum of its parts — its elements are organized in a way that achieves something. (Meadows, 2008)

No one has complete knowledge of the systems we live and work in. And beneath the visible level of events and crises, there are underlying patterns, structures, mental models that are responsible for creating them. If we ignore this, we will stay locked into reenacting the same old patterns time and again. When we take time to understand a system, it helps to both (1) probe and understand the patterns, behaviors, and dynamics of systems and (2) understand and elevate the different perspectives of people and organizations involved.

Exploring the patterns, behaviors, and dynamics of complex systems can be done in many ways. Simple tools like the **Iceberg Model** and **Visualizing Situations and Change** can be used to qualitatively probe insights on the dynamics of systems. Probing questions about underlying patterns, relationships, and structures can elevate different perspectives on components of the system. Be sure to probe the different layers of the system: the political, economic, cultural, social, and ecological layers. And remember that different people may have different ways of understanding and making sense of these systems (e.g., through Indigenous knowledge systems or through Western science). Allow these different ways of understanding and exploring systems to sit alongside one another (see Tengö, et al., 2017).

For those with the technical skills and interest, **Systems Mapping** is a valuable tool for visually exploring the causal relationships and feedbacks in complex systems. A helpful prerequisite to exploring systems dynamics is familiarizing yourself and your participants with some of the basic concepts and terms of systems thinking[2] (see Table 4, below). Once you have a basic grasp of these concepts, you can use them to probe discussions and dialogues about the underlying dynamics of systems.

---

2 Part 1, The Art of Systems Change, p .14

Concepts to guide understanding the system

The concepts of systems thinking and *system dynamics* are useful anchors for probing the underlying dynamics that shape the problem(s) you care about. Familiarize yourself with these concepts and use the probing questions to encourage dialogue and understanding of your system's dynamics.

Concept	Description	Probing question(s)
Causal relationship	Causality is critical when trying to understand a complex system. We traditionally think of x causing y. But in systems, x can cause a change in y, which then changes x again (a feedback loop). Or x and y both cause change in z. Often, multiple factors cause change within the system.	Starting with one element in your system, ask "What causes or influences this directly? How do we know this?" and "Why does this element change?" These could be tangible elements, such as a number of animals, or more difficult elements to quantify, such as community trust.
Feedback loops	*Feedback loops* are created when elements in a system are interrelated to each other; where a change to any element (e.g., number of fish) leads to further change in that element (e.g., more fish). Feedback loops can be "reinforcing," leading to exponential growth or decay, or "balancing," where the system resists change and returns to normal. Most systems consist of multiple feedback loops, sometimes working counter to each other keeping the system in equilibrium.	It often takes practice to identify feedback loops; they are typically more challenging to identify compared to causal relationships. Try asking "What stories are emerging about the system as we talk through the problem?" and "What information do we have that can shape these stories?" Often there are feedback loops embedded in stories. Stories of one change countering another could relate to interconnected feedback loops. You can also ask "What is changing in the system?" If something is increasing or decreasing (for example, the rate of resource extraction or frequency of conflict), there is often a feedback loop creating that change.

Concept	Description	Probing question(s)
Archetype	*System archetypes* are common patterns of system structures that exhibit common behavior over time. Because of this, system archetypes often have common solutions. Some of these archetypes have been identified and named. They include Fixes that Fail, Shifting the Burden/Addiction, Tragedy of the Commons, Drifting Goals, Escalation, Growth and Underinvestment, Limits to Success, and Success to the Successful (Kim, 1992; Senge, 1990.	Review the common archetypes (see two examples in table 5 and Kim and Anderson, 1998 for more). Do any of the archetypes resonate with you or your group? Identifying archetypes in the system helps us understand what relationships, including feedback loops and delays, might be at play in the system and helps in designing interventions for our theories of change and theories of action.
Time and Delay	Time is something we don't always consider when trying to understand a problem, but each action or change in a system takes time. When a change takes a long period of time to appear in a system, this is called a "delay between the cause and effect." Sometimes delays happen around unintended consequences, and some actions take a longer time to implement, such as investment in new staff or creating a new organization.	Are there any impacts that you could envision happening months or years after a change in one element of the system? Have you witnessed delays in the system (e.g. time between a policy being proposed and that policy becoming law)?
Boundary	A boundary is the limit we are setting for the scope of the system we are trying to understand. At some level, everything is interconnected and trying to understand it all would be impossible, so a boundary is needed. A boundary, like a problem statement, may evolve as your understanding grows.	When you're considering what to include or not include in "the system," you should ask: What is integral to the creation (or solving) of the problem? What is within the sphere of influence of the people working on the problem?

Table 4: Concepts to guide understanding the system

Examples of common archetypes

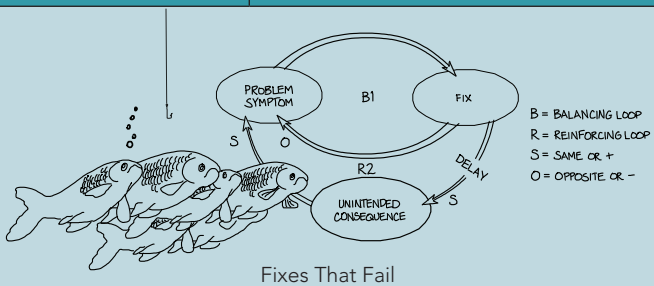
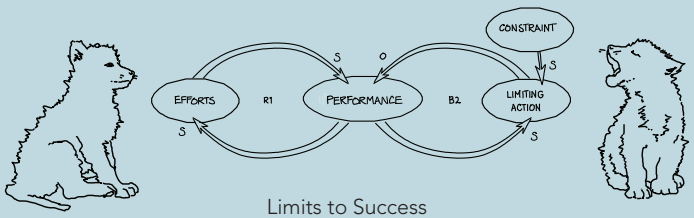
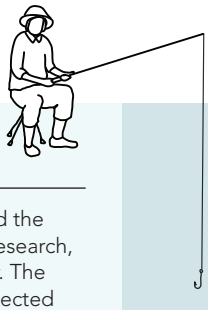
Description	Real-world example
 Fixes That Fail	
A problem (symptom) is drawn to attention, and a quick fix is developed to alleviate the symptom. While the fix reduces or eliminates the problem temporarily, over time unintended consequences make the problem reoccur.	Fish populations have been declining in an area and a conservation organization decides to promote a new livelihood option for the local fishermen to try to divert pressure on fish populations. While fishing declines in the short term, over time the fishermen use their increased wealth to buy better fishing gear so they can return to fishing part-time. This results in an even further decline in fish stocks.
 Limits to Success	
Growing efforts initially lead to successes in performance, which encourage more efforts. In the longer term, the success causes limiting actions (a result of system constraints), which decreases performance. There is a tendency to increase focus on the initial efforts, yet as effort increases, performance continues to drop.	Conservation efforts focus on reducing hunting of a local wolf population in order to conserve its dwindling population. Though initially successful at reducing hunting — the wolf population begins to grow — after a few years, the population growth stops. Campaigns are increased to further reduce hunting, however, the population numbers don't improve. Instead, they start to decline as the largest constraint, available food, limits their population.

Table 5: Adapted from Kim and Anderson (1998), pp. 179–180, where you can find additional examples of common archetypes.

When exploring the dynamics of the system, there will likely continue to be areas of convergence and divergence. It's easier to start by focusing on areas where agreement exists. These might include dates, certain facts about historical events, or causal links that have been articulated in the process of exploring the system's dynamics.



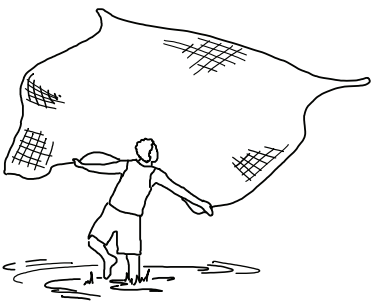
Stories from the field

The power of exploring divergent histories

"I was conducting research trying to understand how different stakeholders perceived the impacts of a community-based marine protected area. At the beginning of my field research, I conducted a series of **Historical Timeline** exercises with fishers from the community. The group included people who had been part of developing and implementing the protected area from the start. It was fascinating — I learned from their perspective, what it was like to overcome the obstacles and establish the area. I made the assumption early on that this group of fishers (who came from different villages) were mostly representative of all the fishers in the area, as I had made a point of inviting participants who used a range of different fishing gear. Their perspectives were also completely different from the one I had heard from the NGO I was partnered with, from the government officials I had spoken to, and from all the available literature I was able to find on the region and the history of the protected area.

About a month later, I was deep into my research and had an informal conversation with a woman who told me that there was a community not far away that I should visit given the subject of my research. When I sat down to talk with members of this community — not even a mile from where I had met the first group — I heard an entirely different history. The new group's story focused on the exclusion, betrayal, and loss of livelihood they experienced from the protected area. While the concept of "different histories" is easy to grasp conceptually, hearing these first-hand stories made it very real. This experience challenged my assumptions about the different groups of people that experience this protected area. Originally, I thought that how people fished mattered more, but through this conversation, I learned that what distinguished these groups was who was involved in the project at the very start.

This story not only shaped my research but also continues to influence how I approach community-based conservation in my work. I now know always to find ways to dig deeper and ask about who might not be part of a planning process or discussion, or who might have a different story or history to share.



Yet, too often, this is where we end. It's important to carefully test, navigate, and document areas of divergence, especially in areas where we might assume there is agreement, like key historical events (see below, The power of exploring divergent histories). Exploring the assumptions that sit under these areas of divergence might involve investigating these dynamics in relation to time (using **Historical Timelines**). But be mindful that areas of divergence often prompt emotional or psychological responses that trigger defensive or conflictual interactions. If this is the case, it may be better to address some of these tougher conversations in later phases when more trust exists between system actors or when strong facilitation or mediation is available to you.

3. Iterate between the two by challenging assumptions

Reading this chapter, you may have noticed that many of the tools and approaches for understanding the system and the problem are actually quite similar and just involve slightly different frames (Principle 2). Moving through this step requires a constant iteration between understanding the system and defining the problem. Remember, a problem is not the same as the actions you take to solve it. When stepping back to identify the problem, there can be a strong tendency to jump straight to discussing solutions in which you previously invested.

Iterating between defining the problem and understanding the system usually requires us to challenge and reassess our assumptions about how the world works. While many of the tools and processes you've already used likely begin to do this, it's helpful to create deliberate space for iteration and use probes that specifically ask questions like, "What must be true about the world for this to occur?" Questions like this (using any of the tools introduced so far) can deliberately surface our assumptions and perceptions of the world.

Earlier, we emphasized how important it is to define a problem well. Defining a problem requires understanding the underlying system that contributes to it. We know our problem definition shapes how solutions are identified and advocated for, who will be impacted, what resources are sought, and how effectiveness is evaluated. Learning to iterate is indeed the art and craft of systems change.

Facilitator's tip: The importance of mindset

If you're facilitating a group through the process of understanding the system, remind people to stay in the "exploring and describing" mindset, even if there is resistance. There is often a natural pull to jump straight into, "We know what the problem is," and facilitators can get swept up by the will of the group. By keeping this phase open and underscoring the importance of exploring, we increase the chances of truly understanding our problem and different participants' perspectives of it.

Moving forward

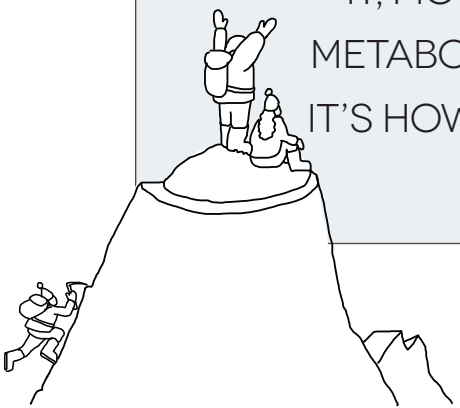
There is no set amount of time to spend on understanding the system. We strive to get to "good enough" at the end of this phase because, in reality, everything we do going forward will not only build but also expand on our foundational understanding of the system and the problem we want to solve. Transitioning to Phase 2 essentially involves giving ourselves the license to expand our thinking beyond the current situation and to imagine possible futures. We know it's time to transition out of Step B if we are able to answer the following questions:

- What is the problem (or problems) that we think are most important?
- Who or what is impacted by the problem, and why is that important?
- What is the history of the problem?
- What dynamics are creating the problem?
- What evidence do we have for the problem's existence?
- What are the boundaries of the problem and the system within which it exists?
- Where is there tension or disagreement about the problem or the system?

We are not striving for perfection when answering these questions: Our understanding will be rough. How long we spend understanding the system is typically decided for us by factors outside of our control, such as the amounts of funding, time, and capacities available. But an indication that we have reached "good enough" is experiencing some discomfort: The four rooms of change model reminds us that we can only experience true growth and renewal by going through a "room of chaos and confusion." Understanding the system requires us to challenge our assumptions, which will typically involve individuals and the group to experience some degree of chaos and confusion before having an insight or entering "renewal."

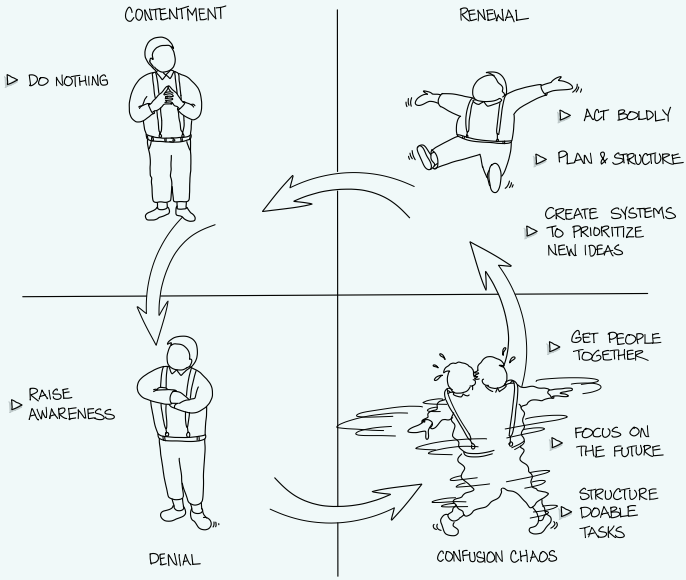
"ONLY BY WALKING INTO OUR PAIN OR DISCOMFORT — EXPERIENCING IT, MOVING THROUGH IT, AND METABOLIZING IT — CAN WE GROW. IT'S HOW THE HUMAN BODY WORKS."

—RESMAA MENAKEM

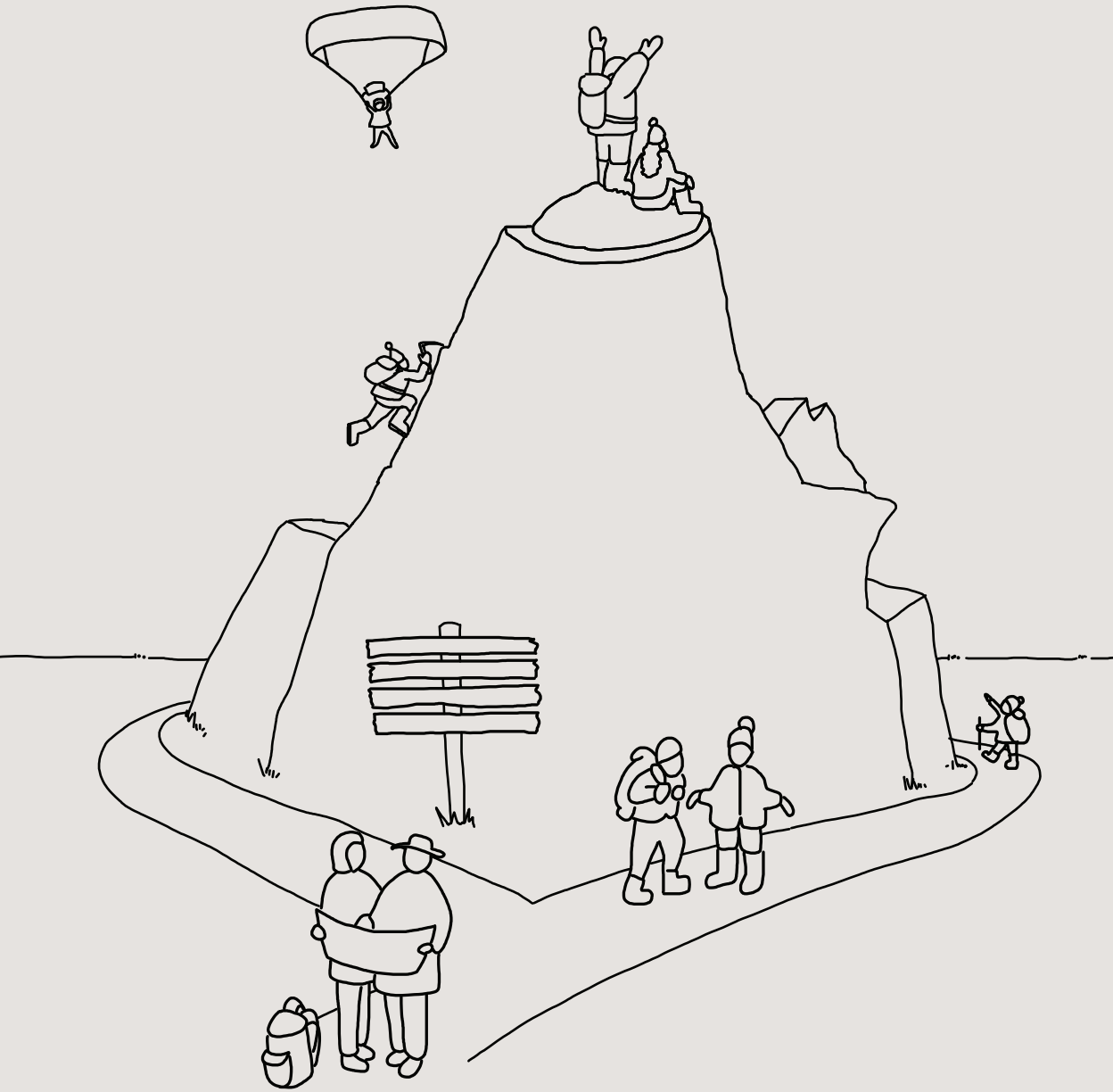


Facilitator's tip: The four rooms of change

Systems-change work naturally includes periods of discomfort. Welcoming these times of uncertainty and confusion results in creative solutions that lead to insights. This model illustrates that all participants move through four phases, or "rooms." Recognizing this can reduce anxiety about the accompanying feelings of chaos and confusion. Embracing and being in chaos and confusion means that renewal and contentment are on the horizon. The four rooms of change can be used as a simple heuristic or as a facilitation tool in a group setting to understand where you and others might be on your change journey.



The ideas and products generated in this phase will be a critical reference point for future phases of change (for an example, see Understanding the system with Semi-structured Interviews, p. 69). As you close this phase, document insights using photographs, notes, or virtual or written artifacts using tools like **Systems Mapping**, the **Iceberg Model**, and **Visualizing Situations and Change**. It's equally important to sense when not to document the process. Early on in a change process, people often need space to have honest and frank discussions with each other, which may require greater confidentiality and discretion. Fostering a culture without blame and allowing for meaningful and real conversations requires sensing and negotiating when and how to be transparent.



FAQs

- **How do I know that I'm done with this phase?**

  Trusting your own intuitive sense and those of your collaborators is the only way to know that you've reached "good enough." Remember that you're on a journey, so there will be many opportunities down the line to revisit your understanding of the problem and its underlying system as you evolve and grow with others.

- **How do I set my system boundary?**

  Setting the boundaries of a system is no easy task — everything is related! But setting a boundary is critical. While working to understand the system (possibly with a systems map or another visual), start from the problem statement and work outward. What causes what? Does any element you are adding or discussing directly impact the problem? You will find there are some influences impacting the system outside of your control, such as climate change and world events. It's ok to note these, but keep them on the edge of your system boundary. This process will help you set enough tentative boundaries on your system to move forward.

- **How do I decide who should be part of the process and who shouldn't?**
  This is one of the most important questions for those on a Systems Journey. You can only journey with those who you trust to have good intentions, so watch how relationships unfold in this phase. Also, pay close attention to power and history. Power dynamics are always changing but often have strongly rooted historical legacies, so ensure that those who you do invite into the process have good intentions and the capacity to build goodwill toward other stakeholders.

Tools referenced in this chapter

- **Iceberg Model**
- **Visualizing Change**
- **Semi-structured Interview**
- **Stakeholder Mapping**
- **Systems Mapping**

Boxes in this chapter

- Even a list will do!
- Facilitator's tip: Using silent conversations
- Mapping stakeholders, power, and relationships
- What does a good problem statement look like?
- Understanding the system with Semi-structured Interviews
- Facilitator's tip: Four ways of talking and listening
- The power of exploring divergent histories
- Four rooms of change

Tables in this chapter

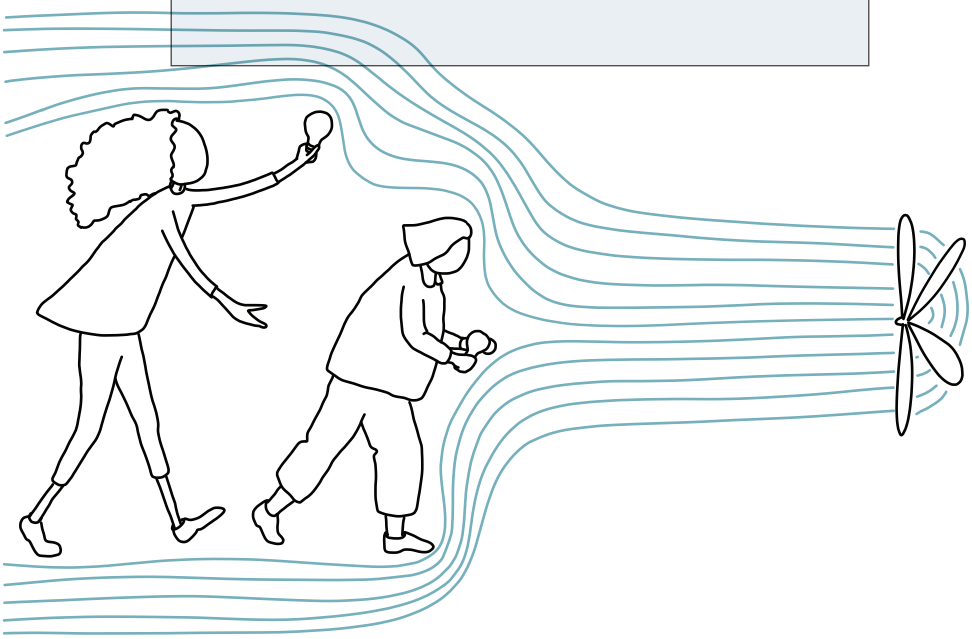
- Table 4: Concepts to guide understanding the system
- Table 5: Examples of common archetypes

SUMMARY

PHASE 2: EXPLORE THE FUTURE

Step C: Co-creating visions for the future

> "WE ARE CREATING A WORLD WE HAVE NEVER SEEN."
>
> —adrienne maree brown



OVERVIEW

Overview

- The first step of **Phase 2: Engage** is Step C: Co-creating visions for the future which emphasizes the importance of exploring and questioning multiple futures rather than focusing on a single, utopian vision. This helps keep us grounded in the reality that the future is uncertain, despite our best attempts to engineer what's ahead of us. This awareness helps us target our actions toward creating a more resilient future, not a perfect one.
- Exploring a variety of futures harnesses the power of diversity and creativity by elevating the different visions that the actors in our system have.
- To co-create future visions we must surface and challenge our pre-existing ideas about what lies ahead, telling collective stories and assessing, navigating, and holding space for the tensions that emerge between different visions of the future.
- Getting to "good enough" in this step involves developing a better understanding of (1) the individual and collective assumptions about what the future can and should look like, (2) where there might be resistance to change, and (3) elements of the future that might be most important to us and others on our journey.

Common outputs from this phase

- A set of scenarios or stories that describe possible futures
- Descriptions of the process of creating visions of the future
- A list of tensions to track over time

Common capacities cultivated in this phase

- Capacity to imagine and think differently about the future
- Capacity to navigate tensions about possible futures
- Sensitivity to time
- Shared language to describe and talk about the future

People often create strategies that assume a direct and transparent relationship between their current actions and the kind of changes those actions will make in the world. We tend to assume that we can predict or engineer the future world as we would like it to be, despite the uncertainty and unanticipated behaviors of complex systems. Thus, as we shift from **Phase 1: Engage** to **Phase 2: Explore**, we look ahead and imagine the many possible futures that we, and the people and places we care about, could thrive in. This sets us up for the rest of Phase 2, where we more realistically assess what actions we should take and how they might create change.

Questioning and re-imagining the future helps us think critically and creatively about the possible situations we could face. Imagining multiple, plausible futures that we want to either realize or avoid helps us orient and then decide which actions or steps we should take first. The future is not inevitable, it is still uncertain — we are co-creating parts of it every day with the choices we make (Wyborn, et al., 2020). We must also face the reality that creating systemic change might involve letting go of our assumptions and expectations about how change happens and what is possible. Dreaming of new futures can inspire us and others to think and behave differently, and importantly, give us hope.

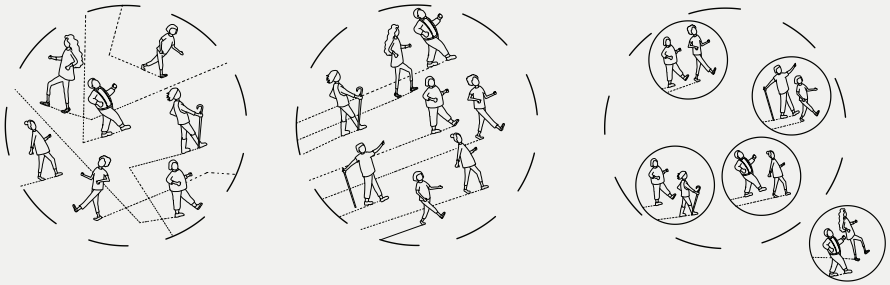
This step is not about creating an identical and ideal future for all. Instead, it is about imagining and interrogating the different futures we might encounter: their possible structures and functions and the new relationships and values that might thrive in these scenarios.

Making explicit the things we hope to see (or not) in the future allows for open and shared conversations about the implications of those futures. If the future is worth living in, then we have the initial motivation to do the hard work of interrogating the actions we need to get there. This step offers a reason to do the hard work

By co-creating visions together, we can:

- Identify shared assumptions about how the future could unfold
- Identify places where a collective effort could lead to better outcomes
- Identify resistance to change and start to imagine how to overcome it
- Imagine multiple potential outcomes for the things we care about (Candy, 2010)

Complementary visions of the future



Moving toward a better future does not require everyone to take the same actions to achieve the same future. As we explore possible futures, some people on the journey might want to invest in different ways to realize different futures based on their individual histories, values, or beliefs. By understanding these differences, we can better work in relation to one another. Even if we're not striving for the exact same future (image 2), we can move from working against one another (image 1) toward moving in the same general direction with complementary visions of the future (image 3).

Facilitator's tip: You can use an image like this to help communicate the value of complementary visions to participants in a journey.

Figure 2: Complementary visions of the future

Who gets to create visions of the future?

You have already begun to form a community of stakeholders in **Phase 1: Engage.** Many of these people will now be ready to work on a shared vision together. Like in earlier steps, asking yourself a now-familiar set of questions as you move through Step C can help you continuously assess who to involve in this phase..

- Are there people who lend credibility to this process (e.g. they are well respected or have authority in their field/location) and who have helped move change forward in this part of the system before?
- Do you have a good balance of more and less powerful voices in this part of the process to make sure the visions represent all perspectives in the system?

- How diverse is your group? In particular, how are different genders, ages (including the youth and elders), expertise, and/or ethnicities who have a stake represented? These groups will likely be disproportionately affected by various "good" futures.
- Are there people who have power or mandate over parts of your system that will be important actors in realizing elements of the future visions you explore?

What do we mean by "the future?"

How to think about the future is a growing field of study. Climate change — among other global changes — is teaching us that potential futures exist far beyond anything we have yet to experience. As a result, new tools and approaches are emerging for collectively imagining futures that are not totally dependent on the past.

We can also differentiate between "existing futures" and/or "preferred/alternative longer-term futures." The first examines how existing processes already underway might play out or be shaped. The second explores and imagines much further into the future, considering beyond what is possible to what would be desirable.

Understanding which kind of future is within the scope of what we are exploring can point us to the most fit-for-purpose tools.

Adapted from Pereira, 2020

How to co-create visions of the future

While we cannot recreate the past, thinking about the future almost always begins with an honest and humble understanding of it, as well as of the present. The artifacts you created in **Phase 1: Engage** will be useful as you start to look to the future. The (initial) shared problem you identified will provide an anchor and also help to set the boundary of the system. Problem statements are often filled with clues that hint at the kinds of dynamics and relations we want to change in the future.

Co-creating a shared vision for the future typically follows three steps:

- Exploring pre-existing ideas about the future
- Telling stories
- Assessing tensions

We are still early in Phase 2, so this step involves thinking about where we *might* want to go (or not go). We are not quite ready to think too deeply about how we will create change or decide on specific actions to take.

Tools can play a variety of functions as you co-create the future. For example, use **Rapid Cycle Prototyping** to advance a group quickly through all three steps. The more future-oriented tools like **Scenario Planning** and the **Three Horizons Framework** progress through the three steps at a slower pace, allowing us to highlight what we want to keep and let go of in moving toward new futures. While this book introduces the set of practical tools (p. 167) that the authors have turned to time and again, there are many more that exist and are being created in the growing field of strategic foresight and futures thinking.

Finally, consider what time horizons will be most helpful for you on your journey. Sometimes, it helps to look into a far-distant future to prompt creative and out-of-the-box thinking (see insights on science fiction prototyping in Merrie, et al., 2018). Other times, it may be more practical to consider a nearer-term future anchored by a specific future milestone (such as a key decision or meeting). It might also help to loop back to the past using a **Historical Timeline** to search for clues about time horizons and the system's current trajectory.

1. Explore pre-existing ideas about the future

Whether consciously or not, we all tell ourselves stories about the future — our own personal futures and our collective futures. Often these stories are rooted in our understanding of the past and become tangled with our own individual values, beliefs, and dreams of what a good future would be. Making the assumptions behind these stories explicit and challenging them can be a powerful way to identify areas of convergence or divergence regarding potential futures. It can also help us "get out of our own way," as often we unconsciously limit ourselves with these stories. By interrogating our pre-existing visions of the future, we can think more creatively about what is actually possible and open up more potential pathways to create change.

Facilitator's tip: Embrace discomfort

When encouraged to think differently about the future, participants might say things like "That's not what I came here to do," or "I didn't know that we had agreed to consider that." Yet exploring stories about different and unexpected futures can uncover areas or topics that people may have previously avoided, or failed to address. Encourage participants to have an open mind and to view discussions about the future as just the beginning of a dialogue. You can suggest participants use "what" and "how" questions with each other (rather than "why") to encourage a balanced dialogue and avoid blaming and defensive behavior.

Generating good questions and ideas about the future helps uncover personal stories and assumptions. Tools like **Creative Writing**, especially the prompt to write a letter to or from your "future self" facilitate this stage.

To facilitate this in a group, prepare prompts for participants to react to based on insights from Step B: Understanding the system. For example, you might refer to notes or images generated using the **Iceberg Model** or **Systems Mapping** and prompt with queries like, "How might these dynamics change in five/ten years?" You could invite participants to suggest vastly different futures from the current system or to identify different but related systems dynamics or feedbacks that might encourage creative thinking about potential futures.

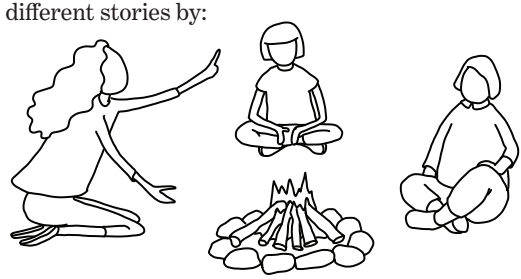
Cultivating an atmosphere of curiosity and freedom for the group will allow different visions to be shared without shutting any down. You'll want to encourage discussion around potential futures even if they don't make sense or even seem viable right now. Let different visions exist alongside one another, preferably in some kind of visual form. You can also ask participants to reflect on any perspectives that might be missing, and consider what kinds of futures that other stakeholders would advocate for if they were with you.

2. Tell stories

Storytelling is an ancient practice embedded in almost every culture across the world. By bringing together our individual stories about the future, we can see what collective stories about the future emerge. Stories also encourage us to be more specific and can help us consider how our actions today might impact those yet to be born or those who cannot be part of our journey today. Stories about the future come to life when they employ tangible examples about what a future could look like. Whether written, visual, or told orally, stories can become artifacts useful for inviting others onto the journey or reminding participants of where they have been.

Allow people to tell stories in any format they prefer wherever possible. Eventually, you will aim to end up with a written narrative, too. But some people might be more comfortable with images (**Visualizing Change**), verbal storytelling, or written stories (**Creative Writing**). Allowing for a variety of storytelling approaches might require more effort, but will support intercultural, interdisciplinary, and inter-generational communication and sharing. You could also encourage participants to explore what dynamics they might see in the future. Refer back to some of the basic concepts of systems thinking from Phase 1: Engage and explore what kinds of feedback loops, relationships, or system archetypes (see Table 4: Concepts to guide understanding the system, p. 73) could be present in one or more futures.

As these stories are shared, a group can process the different stories by:



1. Highlighting commonalities between or within stories and beginning to document them
2. Noting tensions or differences between or within stories
3. Querying what it would take for these stories to become real
4. Introducing moments to slow down and take a break, particularly if members of the group have strong reactions to the exercise. Don't ignore these reactions; instead, encourage participants to be curious about where they are coming from.

Facilitator's tip: Change up your location

It's important to consider how the physical location where you hold these activities shapes the process. Creative thinking is critical for many phases of a Systems Journey, especially when trying to imagine futures we have never seen. Since our intent is to think differently, try spaces beyond the usual conference room or work area. For example, visiting art installations, exploring the outdoors, and walking can prompt creative thinking. If the process is being held remotely or virtually, you can still be creative about where you ask participants to call in from.

3. Assess tensions

In **Phase 1: Engage**, we uncovered areas of tension where people's ideas and perspectives of the system may have been different. The presence of tensions will not change as we move toward the future. It is crucial to create space to explicitly acknowledge these tensions — especially between possible futures — throughout the journey. This helps to ensure that the real issues get talked about as the journey progresses. This can be done by creating a list of tensions that come up during meetings or workshops, or through facilitation exercises like *polarity mapping*, which helps individuals or groups explore a "polarity," or a pair of values or ideas that seem to be in opposition to each other but are more often interdependent. (see CoCreative, 2020 for a detailed guide on polarity mapping).

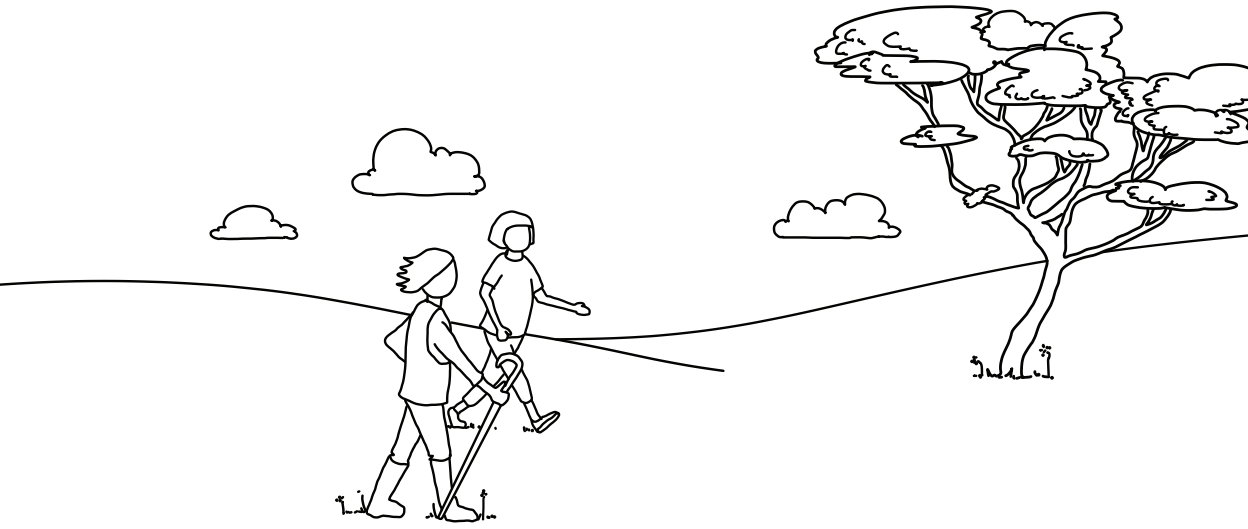
Tensions often arise from the intersection of individual and collective values, attitudes, and beliefs, so remember that exploring ideas about the future can become deeply personal. It's only human to want agency over your own future, and grappling with uncertainty here can be extremely difficult for many. Feelings of fear, grief, and panic might be at the root of how people react to these exercises, especially if the future(s) being described feel threatening to us, our work, or the things we love and cherish (like the natural world, our families, and communities). While some people might feel empowered to describe radical changes, others will need time to process and warm up to the idea. All of these feelings will shape how and why tensions emerge, and whether they can be effectively navigated.

Identifying and assessing tensions can highlight how deeply rooted the causes of today's perceived problems might be. Some participants might decide to pull back or feel wary. The development of strong relationships through genuine co-creation will prove critical to fostering enough trust to make this part of the journey impactful in the long run.

As you move forward, remember that it is good, and only natural, for tensions and differences to sit alongside one another in a journey. But remember, too, that sometimes tensions can be actively at odds with one another, and this can become a problem as you strive to identify shared goals and actions in the later steps of Phase 2. This may be another good moment to reassess whether the conditions are making it safe or wise to continue on the journey (see When to use (or not to use) this guide, p. 14).

Facilitator's tip: Encourage deep listening

When assessing tensions about the future, revisiting the four ways of talking and listening (p. 70) can facilitate deeper listening and more authentic conversation. These can help people externalize their internal, intellectual, and emotional processes in less threatening ways and also allow people with different personality traits to engage more meaningfully.



Elevating perspectives on the future using Rapid Cycle Prototyping

An NGO convened a national dialogue on community-based conservation in the hopes of both slowing down to understand the system and creating a forum where members of community-based organizations and government from across the nation could meet for the first time to share experiences. The dialogue was designed to facilitate learning and knowledge exchange, as well as to identify ideas for actions that could create change that all participants could act on in their different roles supporting community-based conservation.

One of the tools used during the dialogue was **Rapid Cycle Prototyping**. In this exercise, the question from Step C was posed: "What do you want the future to look like for community-based conservation?" In small groups (3-5 people), participants built physical models using only materials they had in the room, like bags, pens, water bottles, and glasses. After 10 minutes, groups were paired with another group to present their models to each other. They shared how this future related to them as individuals and their role in conservation, asked questions about the other group's model, and combined their models into a shared model of their vision for the future. This went on for several rounds until there were two large groups with two large models.

Getting to the final models involved lots of discussions and negotiations about how and if different visions for the future could be combined or sit alongside one another, and which were incompatible. When it came time to present the two final models, the two models of the future were quite different, representing different stakeholders and perspectives (the facilitator let groups self-select as they were presenting to one another).

One group comprised mostly NGO staff and national government representatives. Their model focused on a very optimistic and perfect future in which all of the conservation problems they were working on were solved. The second group included mostly participants from community-based organizations. Their model focused largely on the legal process of transferring rights from the government to community-based organizations. (It is also interesting to note that securing the rights to manage and make decisions around natural resources can be thought of as a leverage point for change that increases self-governance (see Step D: Analyzing leverage, p. 95).

The differences between the models led to a discussion in which participants debated the intent of the exercise. This in turn allowed participants to realize that the two groups had two different views on what was possible and important for the success of community-based conservation. Community-based organizations believed that, if the process of transferring rights could actually work, they would achieve their goals. Those within government and NGOs (who were farther from the realities on the ground) did not perceive the transferring of rights to be such an insurmountable problem. The energy in the room shifted after the participants had this collective ah-ha moment.

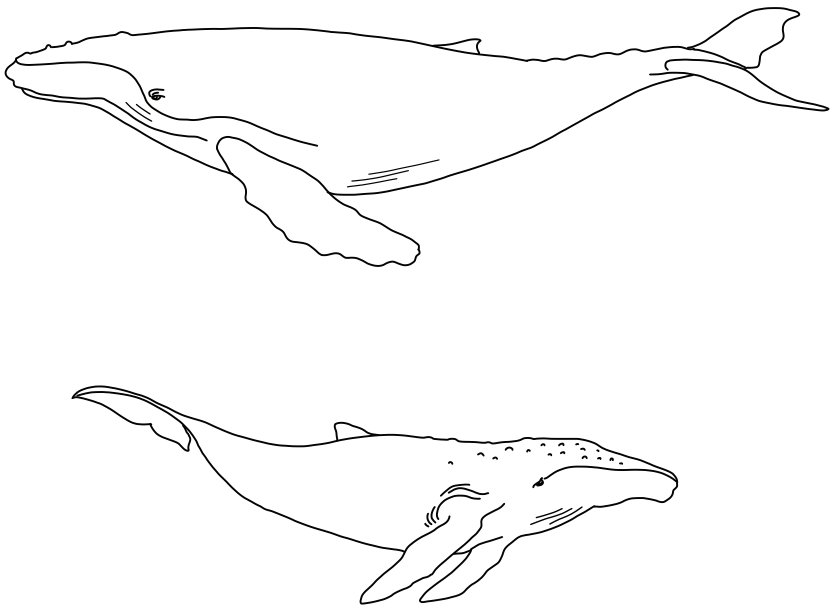
Long after the dialogue, this insight led the convening NGO to think carefully about its own five-year strategy and to elevate the importance of community-based conservation in its work, with a special focus on the transfer of management rights and relationships between the government and community-based organizations.

Moving forward

This step is not about creating an identical and ideal future for all nor setting any sort of quantitative target. Phase 2 focuses on surfacing, imagining, and interrogating many potential futures, their possible structures and functions, and the new relationships and values that might thrive in these futures. To reach "good enough" in this step, you and others should have an understanding of:

1. The individual and collective assumptions about how the future could unfold
2. Where there might be resistance to change
3. Elements of the future that might be most important to everyone the journey

As we move to the next step in Phase 2, Analyzing leverage, we will narrow down the places where we could create change to realize parts of the futures that we and others want to see. These many potential futures push us to the edge of our imaginations. It is with an open mind and creative ideas that we take our next step in the journey.



SUMMARY

FAQs

- **Is this where I develop my vision statement?**

  No, this phase is not about defining an idealistic, singular vision or target. This phase involves imagining the many different futures that might unfold. This creative thinking will support later phases during which you consider which actions to take and what kinds of changes those actions might create.

- **How many futures are enough?**

  We suggest exploring at least three if not many more futures. It's important not to focus on a single "utopian" scenario, or get stuck between two extreme poles of a perfect future and a terrible future. The more futures you explore and the more specific you are able to be about these possible futures, the more ideas you will have for informing your goals and vision later in Phase 2. The more participants you engage, the more futures you might want to explore to ensure that everyone's perspectives are heard.

- **I keep getting stuck thinking only about a utopian scenario and the "life is terrible" scenario. Help!**

  Getting out of the two poles is tricky — often, being more specific will help! What are some specific changes that you might see in one of your futures? How do relationships between people change as a result of these? Can any of the concepts from systems thinking (p. 73) help you imagine these possible future relationships and dynamics? Can you use unique probes to get people thinking about the trade-offs in the different futures? Finding unusual futures involves asking lots of questions!

Tools referenced in this chapter

- **Creative Writing**
- **Historical Timeline**
- **Rapid Cycle Prototyping**
- **Scenario Planning**
- **Three Horizons Framework**
- **Visualizing Change**

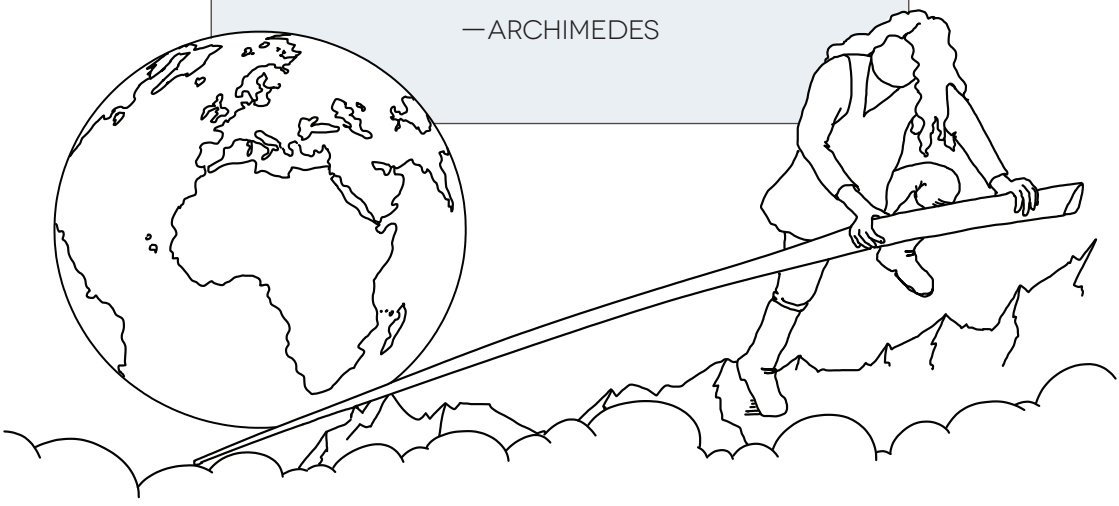
Boxes in this chapter

- Complementary visions of the future
- What do we mean by "the future?"
- Facilitator's tip: Embrace discomfort
- Facilitator's tip: Change up your location
- Facilitator's tip: Encourage deep listening
- Elevating perspectives on the future using Rapid Cycle Prototyping

Step D: Analyzing leverage

"GIVE ME A LEVER AND THE RIGHT PLACE TO STAND, AND I SHALL MOVE THE EARTH."

—ARCHIMEDES



OVERVIEW

Overview

- **Leverage points** are places in a system where a small shift can produce big changes in the entire system. We analyze for leverage to better understand where to focus our efforts to realize more structural and systemic change.
- Basic concepts from systems thinking like understanding the goals of a system, how problems change over time, the influence of feedback loops, and characteristics of common archetypes can help us search for leverage.
- There are both deep and shallow leverage points. We are most interested in searching for "deeper" leverage points, such as those focusing on the goals of the system or the paradigms and values that govern how we and others think, work, and act in systems.
- Leverage points can be identified using facilitated discussions which, if resources allow, can be complemented with computer-based modeling tools.
- Analyzing leverage may lead you to revisit your understanding of the system and how you define the problem and that can be a good thing!
- It's time to move on once you have a good sense of where in the system there might be the capacity to address deeper leverage points and which dynamics of the system you might act on to catalyze change.

Common outputs from this phase:

- Descriptions of systems features and structures
- Identified system archetype(s) that may be underlying your problem
- A list of deeper leverage points and an understanding or description of why they are important
- Refined systems map and/or description of the problem and system

Common capacities cultivated in this phase:

- Capacity to distinguish deeper leverage points from shallower leverage points
- A better understanding of the different methods for analyzing leverage
- Clarity on areas of the system where change might be possible and strategic
- Capacity to apply concepts from systems thinking to find leverage

At this point, you've reflected on your own intent and have started to understand the dynamics underneath the problems you are trying to solve in **Phase 1: Engage**. In **Phase 2: Explore**, you have begun exploring the hopes and tensions around what the future might hold. In the process, you will have accumulated outputs that describe connections, relationships, histories, futures, and dynamics in your system. You may also have now taken people on a journey in which strong values, cultural differences, and emotions have started to interact. Through the relationships created on the journey, you are likely already creating systems change. How great! But now, we take one step forward and ask *where* and *how* we might create systemic change by analyzing for leverage.

Why do we need leverage?

The concept of leverage comes from physics. According to a fable, Archimedes, the Greek mathematician, said, "Give me a lever and the right place to stand, and I shall move the Earth." Simple machines such as the lever allow us to move what was previously impossible.

The same thing is true for leverage in systems. We can put intense amounts of energy, time, money, and other resources into shifting our systems, only to see nothing change, only temporary improvement, or watch our problems get worse. Alternatively, we can look for mechanisms where smaller changes cause cascading effects over time.

Environmental scientist Donella Meadows (2008) defined leverage in complex systems as *leverage points*:

> These are places within a complex system (a corporation, an economy, a living body, a city, an ecosystem) where a small shift in one thing can produce big changes in everything.

Analyzing leverage involves taking a step back, considering the dynamics of the system, figuring out where to grab hold and what to avoid, and then devising interventions that get the system to do the work in moving toward one or more desirable futures.

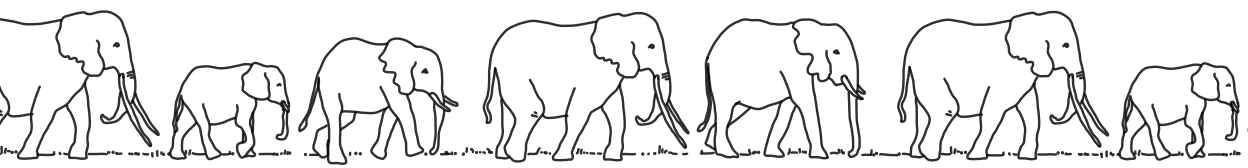
Revisiting the basics of systems thinking

To find leverage, we bring together the knowledge we have co-generated throughout the journey so far and reflect on it using the concept of leverage. To do this, it helps to first revisit some of the basic concepts from systems thinking[1] that we encountered earlier in Step B: Understanding the system, and explore how they relate to finding leverage:

---

1 The Art of Systems Change, p.14

- *Goals of a system*. We've already defined a system as more than the sum of its parts, with elements organized in a way that achieves something and spent time understanding the system we're working within. The systems we live and work in are often not achieving what we want them to achieve (which leads us to perceive and define problems). But they are achieving some purpose. Revisiting and naming what some of the system's current goals are (e.g., profits to a corporation, power or control to a group of people) can help you realize where some of the opportunities for changing goals may exist. The goals of a system are often different from our individual goals. This difference can be helpful to acknowledge.
- *Problems and changes over time.* Our problem statement has likely evolved and will play an important role as we look for leverage. Often the problems we perceive and try to address are "problems" because something we care about is changing or has become stagnant over time. For example, the number of tigers in the wild has been declining over the last 30 years, the amount of conflict between different stakeholder groups has increased in the last few months, or (despite investment) tourism to a park has stagnated in the last three years. Similar to reflecting on the goals of the system, attuning ourselves to how these elements are changing over time gives us hints about the underlying structure of the system (particularly feedback loops) and where opportunities for change might be.
- *Feedback loops*. Feedback loops reflect the notion that elements in the system are interconnected in loops that create either positive or negative behavior. Over time, we see that positive feedback loops result in exponential growth, explosion, decay, and collapse (Meadows, 1999), while negative feedback works in the opposite direction to keep a system in equilibrium. An example to describe these patterns can be found in fisheries: in unmanaged fisheries, declining fish stocks (and thus smaller and more expensive catches) may increase the price of fish, which encourages further fishing and the collapse of the fishery (*positive feedback loop*). In a well-managed fishery, once fish stocks decline past a certain threshold, limitations are placed on the number of fish allowed to be caught, therefore fewer fish are caught, and the fish population recovers to an acceptable level (*negative feedback loop)*. Most systems are made of multiple feedback loops that underlie changes over time and achieve the goals of the system. Identifying these loops is a starting point for questioning how and if they can be disrupted to create more desirable system behavior.
- *System archetypes*. While the world's contexts are diverse, there do seem to be some common systems structures (relationships and feedbacks) that can be found in many different areas. Kim and Lannon identify and name eight common archetypes:, Fixes that Fail, Shifting the Burden/Addiction, Tragedy of the Commons, Drifting Goals, Escalation, Growth and Underinvestment, Limits to Success, and Success to the Successful (for examples, see Table 5, p. 73). Reviewing these archetypes and understanding the signs that they might be present in your system can help to identify leverage points particular to that archetype, and also to avoid common pitfalls in trying to change it



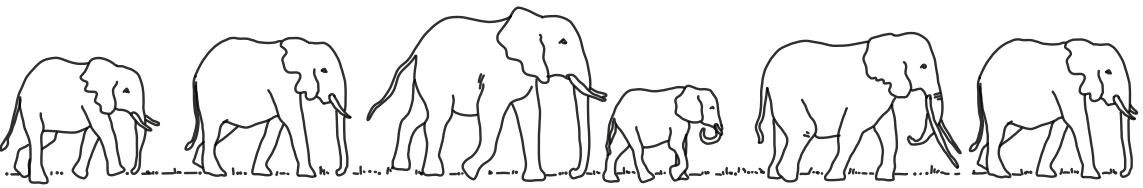
Finding deeper leverage points

Chances are you've already identified and acted on leverage points in your work or life intuitively as you and others have worked toward shared goals. Sometimes finding leverage is intuitive and identifying these "points" doesn't take special training or tools (though these can help! See Table 6 on the next page). However, it's important to note that deeper leverage points are often more effective in creating bigger shifts in complex systems, altering structure and function, while "shallower" leverage points typically alter or change equilibrium points in small ways. Addressing deeper leverage points can also help prevent the same problem from resurfacing over and over again in a system. By finding deeper leverage points, we can focus our energy when we move on to developing theories of change and action in the final step of Phase 2.

Effective leverage points do not change a single element or attribute of a system, but more often focus on shifts in multiple causal relationships and feedback loops. Perhaps a new feedback loop could be added, or the system reoriented toward a new goal. Remember, too, that we are all part of the systems in which we work and live (Principle 1), and so are our organizations, administrative processes, and the policies that govern our work. Be sure to consider these influences when you are trying to understand a system and find leverage.

When trying to fix a problem, it can be easy to focus on shallow leverage points; for example, specific numbers or parameters we would like to see change, such as an increase in the number of elephants in an ecosystem. We can work hard making that number change slightly, however, to truly change the behavior of the system (in this example, move from a declining population to an increasing population of elephants) you will probably need to focus on a deeper leverage point that changes multiple parameters and other structures (e.g., causal relationships) at the same time. We might also focus on points in the system, such as existing physical infrastructure (i.e., roads, buildings, or dams), that would seem to potentially create large change, yet are too slow or even impossible to adjust once in place.

It's critical instead to find deeper points of leverage with the potential for change. The deeper the leverage point, the more it focuses on how actors work together across and within systems. Table 6 below provides some examples. Though deeper leverage points create an outsized impact, it's important to note they are not often quick to change nor easy to address.



Examples of deeper leverage points in a system

Adapted from Meadows (1999). See *The Art Of Systems Change* (p. 67) for more information, including a complete diagram of leverage points. Organized here from shallow to
deeper leverage.

Leverage Point	Description	Example of real-world leverage points and ideas on how to address them
Balance in the system	Influencing the strength of existing feedback loops or creating new loops in a system can be effective in reducing problematic behavior or shifting system behavior to reach your goals. Understanding causal relationships, rates of change, and delays are important here. **Questions to ask** Are there ways to disrupt, slow down, or speed up feedback loops to reach your desired futures? If you're trying to reduce growth or decay, could you create a new feedback loop (physical or informational) that can help rebalance the system?	Worried that certain leaders will keep profits from harvesting octopus from a marine closure to themselves, a local community-support organization encourages balance in the system by working with leaders to establish annual or bi-annual public meetings and transparency mechanisms for all financial transitions.
Rules and regulations	Rules and regulations (both formal and informal) are part of the structure of a system and changing them can be an effective way to create systems change. These points can include new policies, punishments, contracts, and incentives. **Questions to ask** What are the current rules and regulations influencing your problem and ability to achieve your desired futures? Where are rule changes or additions needed? How could these changes impact the rest of the system?	A conservation organization is worried about increasing elephant mortality in a country. The current wildlife policy does not explicitly make the killing of elephants illegal. Though it may be difficult to accomplish, advocating for a new wildlife policy that makes killing an elephant without a permit illegal and punishable provides the legal framework to then reduce elephant mortality.

Leverage Point	Description	Example of real-world leverage points and ideas on how to address them
Power to self-organize system structure & governance	This leverage point focuses on increasing system resilience by empowering actors within it with increased knowledge, capacity, and agency to make changes. This means that actors in the system can decide to add or change any of the leverage points above (adding feedback, changing rules) to evolve in the future. **Questions to ask** How much power and capacity do different groups of people have in the system? How can we increase the ability and capacity for different people to act to improve the system?	A natural resource management agency within a government and leaders of an Indigenous community have been struggling to agree on sustainable forest-harvesting limits and rights. To lessen conflict and allow for clearer long-term decision making, the government (with pressure from outside groups) establishes an official co-management body that has been granted the authority to make decisions on harvesting limits and rules. This body is required to have an equal number of government officials and Indigenous representatives who are elected into their positions by their respective constituents.
System goals	Shifting the goal(s) of the system is a powerful, though challenging, leverage point. This is because all systems are achieving a goal, and shifting that goal involves many of the other leverage points combined. **Questions to ask** What goal is the system achieving right now? What goal(s) would you like it to achieve? Is there a goal that, if shared by others, would create change?	A park manager is struggling to find a solution to the decline of an endemic antelope population. A big challenge they face is that antelopes migrate between private lands and the park every year. The manager decides to bring community, government, and NGO leaders together to identify a shared goal for their shared systems, that all stakeholders value and agree on, for the recovery of the species. This takes time, but it allows each stakeholder group to reorient its own priorities to align with this new shared goal.

Leverage Point	Description	Example of real-world leverage points and ideas on how to address them
Mental models and paradigms	Mental models and paradigms are the fundamental underlying values and beliefs held by people in the system about how things work (or should work). These are sometimes hard to identify, but they often underlie the way a system is functioning. Some examples of collective paradigms are (a) protected areas are only effective without people, (b) economies should always be growing, and (c) nature only has value when it's useful to people. **Questions to ask** What major assumptions are we (and others) making about how the world works? What do we or other actors value and why? Could these assumptions and values be changed? What would happen if we shifted our thinking?	After years of steady decline in wildlife numbers, leaders in a natural resource management agency look for a new approach. A series of exchanges with a neighboring country that has embraced a community-led approach to conservation helps foster a shift in the dominant belief that (a) communities can't manage, and will exploit their wildlife and that (b) the only way to save wildlife is to increase law enforcement and punishments to reduce illegal harvesting and exclude communities from wildlife areas. This collective mind shift — especially by those in high-level government positions — opens up many more leverage points for change. For example, the shift in values leads to new policies that devolve rights to communities (leverage point: the power to self-organize), and funding becomes available for community-led groups to develop new management plans (creating shared goals).

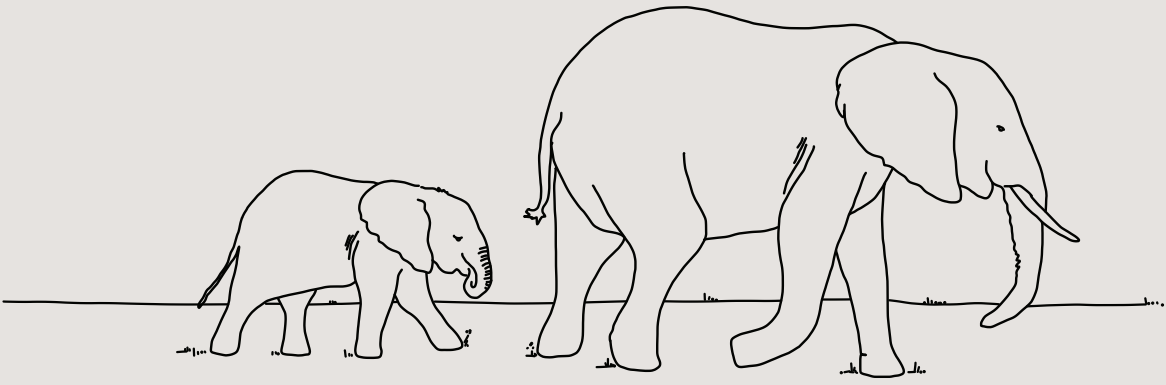
Table 6: Examples of deeper leverage points in a system

Community-based conservation as a deep leverage point

In the 1980s, after a period of conflict, the populations of elephants, lions, and antelope species were declining dramatically in Namibia. A shift during colonial rule had moved power and ownership of natural resources (including wildlife) from communities to a central government. The government at the time was trying to maintain wildlife by increasing enforcement and the relationship between local communities and law enforcement was rife with conflict. Elsewhere in Africa, the idea of community-based conservation had been taking hold; the Communal Areas Management Program for Indigenous Resources (CAMPFIRE) program in Zimbabwe (Child, 1996), for example, had started with the goal of devolving the right to resources back to communities.

This "new" approach was attractive to the newly formed independent Namibian government beginning in 1990. By 1996, community conservation was written into policy, and by 1998 the first four communal conservancies were established (IRDNC, n.d.). Instead of looking to institute enforcement measures to increase punishments, the government of Namibia allowed for communities to self-organize and agree to manage their wildlife. Though not without challenges, communal conservancies now cover 20% of Namibia's land area, and wildlife populations have stabilized and recovered since the program began (Jones and Weaver, 2012).

This story shows how shifting a deep leverage point that spanned government, NGOs, the donor community, and communities living adjacent to wildlife, led to more systemic and transformational change. In order to establish the program, champions within all of these different groups changed the way they saw the problem of and solutions for wildlife decline. This allowed for new legislation and the development of a new approach country-wide. In this case, the shift in the deep leverage points (mental model around how conservation should work) unlocked two other leverage points: first, a shift of system goal from keeping communities away from wildlife to communities and governments working together with wildlife; and second, an increase in self-governance of actors in the system, with communities living adjacent to wildlife increasing their capacity to manage and govern resources across different institutions. For more on this case see communityconservationnamibia.com.



How to find leverage

Using the concept of "deep" leverage points together with our knowledge of systems dynamics can help us identify places for creating the change we hope to see in complex systems. Finding leverage is also closely tied to what has already been done in Phases 1 and 2, in particular efforts to understand the system, identify the problem(s) we want to address, and discover our visions for the future.

Leverage points can be identified using facilitated discussions which, if resources allow, can be complemented with computer-based modeling tools (for example, interactive *causal loop diagrams* or *system dynamics models*). Both approaches (with and without computational models) are described below, along with the benefits and challenges of each approach.

Facilitated discussions to find leverage points

The simplest approach to finding leverage involves using the outputs you have already generated (for example, **System Maps**) as anchors for discussions to elucidate and sense how feedback works in the system and which leverage points are the most important and relevant. You may be able to weave these kinds of questions into tools used during earlier phases of the journey, such as **Systems Mapping**, **Scenario Planning**, and **The Three Horizons Framework.** When these exercises are done with others, the wisdom of the group can emerge.

Semi-structured Interviews also can be used to gather feedback from specific individuals or groups. Direct questions that use concepts from systems thinking (see Revisiting the basics of systems thinking, p. 97) can help guide interviews or discussions. You could ask, "What are the current goals of the system? What is causing the problem? Why does this problem exist? What relationships (or dynamics) are contributing to this problem? And how do these relationships and goals relate to the types of leverage points in systems?" (for more probing questions, see Table 2: Check your conditions, p. 50).

As you move through the analysis, call out, label, and tag the leverage points you identify. Noting these features — even just for yourself — will be helpful as you move toward identifying actions that can catalyze change. As you identify potential leverage points, it can help to interrogate these points and ask yourself questions like what kind of impact changing those leverage points can have in the system? Where might unintended consequences arise? At the end of the discussion, you should have a refined list of leverage points with a rough assessment on which are deeper versus shallower.

Complementing discussions with computer-based tools

There are many computer-based tools that can help uncover areas of leverage that are not easily detected through discussion alone. Similar to how **Systems Maps** are used as anchors

in discussions, computer-based simulations or models can complement people's intuition, challenge assumptions, and tangibly depict how a system may evolve over time given a collective understanding of how a system operates today. Considerations when choosing whether or not to use computer-based tools include cost, access to relevant experts, time available, your goals, and the questions you'd like to ask or problem you are looking to solve (see below, Table 7). In general, if you are looking to test or compare the effectiveness of different actions or policies, a computer simulation model may be very helpful in understanding whether the policy would have the desired effect.

Common systems modeling approaches and their uses

Name	Description	Strengths	Limitations	Reference & Software
Leverage analysis	A method of analyzing system structure with algorithms from graph theory. Different measures have been adapted from social network analysis to identify the "most central" phenomena in a system. Kumu.io is one web-based software with built-in centrality-analysis algorithms you can use to model and apply these algorithms to your system.	Tools like Kumu have no cost.	There is often a learning curve with using these kinds of tools. This type of analysis does not actively explore change over time.	Murphy and Jones, 2020 Software: Kumu.io

Name	Description	Strengths	Limitations	Reference & Software
System dynamics modeling	System dynamics (SD) is a computer-aided approach to policy analysis and design that combines both causal loop diagrams and dynamic simulation models of stocks and flows (see *The Art of Systems Change*, p.19) to understand systems, solve problems, and test policies. Valuable for problems that are dynamic (changing over time), involve feedback, non-linear relationships, and delays, and involve multiple stakeholders.	Helps clarify assumptions and focuses on the major underlying structures that generate system behavior. Appropriate for complex problems. Models can be used to quickly test multiple policy interventions.	A participatory approach can be time-consuming. Not appropriate for capturing the behavior of individuals. Not appropriate for problems that don't involve feedback.	Sterman, 2000 Ford and Ford, 1999 Software: Stella, Vensim, AnyLogic, Studio, Insight-Maker, Loopy, Cauzality
Agent-based modeling	A type of simulation model that focuses on discovering emergent system behavior from individual actors in a system. Each actor is assigned unique attributes and set to interact with other agents (people, places, things) in the model according to specific rules. Unexpected behavior may emerge from the combination of the actions and choices of the actors in the system.	Helps understand what emergent behavior may come from the actions of individuals. Can incorporate stochastic events into models to observe resulting behavior. Good for spatial problems.	Can take a long time for large models to run. Structure can be hidden in the programming language.	Railsback and Grimm, 2019 Wilensky and Rand, 2015 Software: AnyLogic, NetLogo

Name	Description	Strengths	Limitations	Reference & Software
Discrete event simulation	A type of simulation modeling that is appropriate for problems with a lot of detail complexity (e.g., manufacturing supply chain or process, hospital administration, etc). It is best suited for projects that can be broken into a logical set of discrete but connected, sequential processes. For example, a resource becoming available or a person reaching the front of a line.	Can handle a lot of details focused on operational activities in complex processes.	Not appropriate for dynamic complexity (changes over time) and best with highly accurate data on past events and processes.	Fishman, 2013 Robinson, 2005 Software: AnyLogic, Arena

Table 7: Common systems modeling approaches and their uses

You might go through the leverage-finding process once or even several times and still not feel confident that you have found effective leverage points. Remember, this is an iterative process: the more you explore and test, the more you learn and the deeper your understanding becomes.

You may also feel as though the leverage points you have identified are too difficult. Identifying actions that can meaningfully address leverage points (which will be explored further in Step E: Developing systemic theories of change and action, p. 111) can be a challenge. Adding to the difficulty is the tendency for systems to resist change. The more influential something is in a system, the more the system will resist or push back. Iterating with a variety of perspectives always helps — the more you break down and discuss parts of the system with others who may hold different knowledge, the more opportunities you are likely to find for identifying new areas of deeper leverage.

Moving forward

When we search for leverage, we strive to understand where in the system we might have the greatest chance to catalyze deeper systemic change. For this step to work, we must be honest in describing the world (or system) as it actually works, rather than how we think it should work (a key reason why we engage in co-creation). Hard truths about how the world works now, no matter how uncomfortable or painful, set us in a much better place when we start to discuss what actions to realize these points of leverage and move the system toward a more desired

state. Getting to "good enough" at the end of this step means you have more or less answered the following questions: Where are the greatest points of leverage in the system? Which of these are potential areas where we could create change? And what are some of the dynamics that we might try to change to act on the deeper areas of leverage?

As we move from analyzing leverage into our final step of **Phase 2: Engage**, we use the areas of leverage we've identified to explore how change might happen and what we can do to catalyze that change. Using leverage to shape our ideas for action and our theories on how change might happen helps us find some simplicity in complexity (Principle 5), lending power to our interventions and making them workable and even elegant.

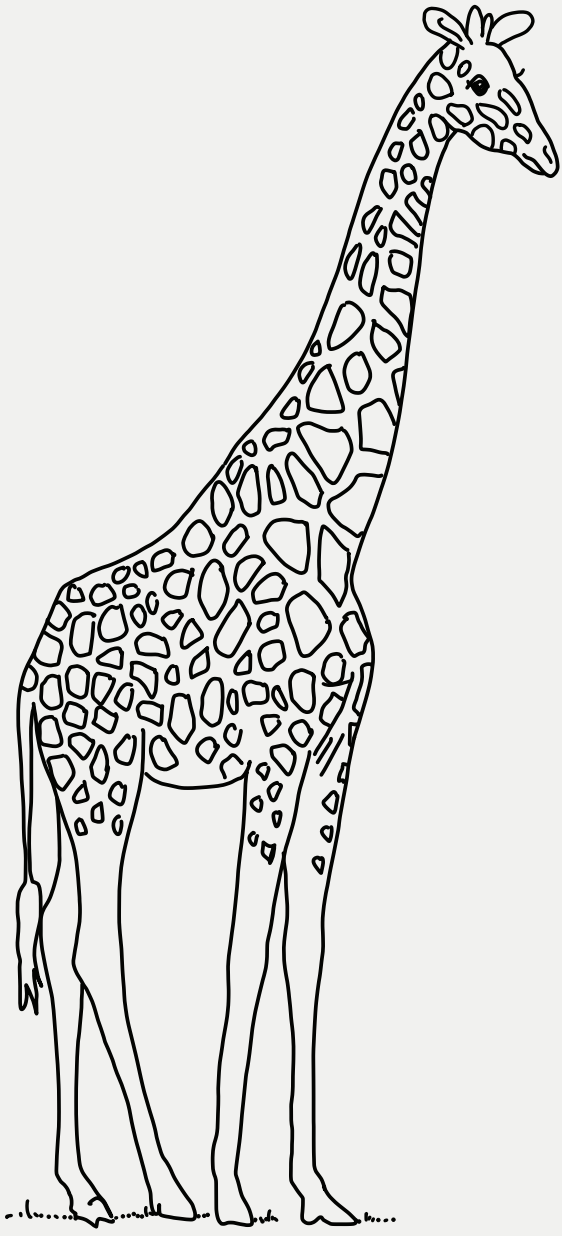
Stories from the field

Uncovering hope as a leverage point for change

A network of development and conservation NGOs was interested in safeguarding the future of coral reefs within a changing climate. To understand the system and identify strategic actions, the network convened a series of national-level workshops over two years to discuss the state and future of coral reefs with people from resource-dependent communities, non-profits, and governments. Through these workshops, participants discussed the challenges and opportunities facing coral-reef conservation and their hopes for the future. All this created a "systemic understanding" of the environmental, economic, and social aspects that influenced the history, current state, and future of coral reef ecosystems.

Two years of learning created a lot of ideas for action. To help prioritize actions into a global fundraising strategy, the initiative's core team (with the help of a colleague and consultant with experience developing collaborative system maps) created a systems diagram using **Systems Mapping** to summarize the collective "mental model" of coral-reef conservation. The map utilized artifacts from the first two years of the program, which included notes, reports, and photographs from the many workshops and meetings that had been held to understand the different needs and perspectives in each country where the initiative was to operate. The map was created using the web platform Kumu.io, and a mathematical-leverage analysis was carried out using the platform so as to quantitatively identify system features and possible points of leverage that had not already been specifically raised by stakeholders in the workshops. While many of the leverage points that surfaced were intuitive, *hope* emerged as an unexpected point for change. While stakeholders had emphasized the hopelessness of coral reef protection in many of the workshops, none had called it out as an area for possible action. The lack of hope for coral reef conservation was a shared mental model held by many in the system, who were struggling to reconcile the threats to people and marine ecosystems today. But could it be possible that addressing this lack of hope in coral-reef conservation head-on could unlock other areas of leverage?

During a planning call, the outputs of the leverage analysis were presented and discussed by project partners. These helped the team realize that hope was a new way to consider shared challenges, changing the tone and direction of the planning meeting. The team discussed how they needed to find new ways to break this sense of hopelessness, despite hope being — as one participant put it during a planning call — "slow to build, quick to die."



SUMMARY

FAQs

- **We know what we need to change in the system and we've been trying to change it for many years. How can this process help?**

  If you find yourself staring at the same leverage point or taking the same actions and not making much progress, revisiting your problem statement could help illuminate other aspects of the system and new leverage points. Your initial problem might be, "How to reduce trade in ivory?" while an alternate problem may give more productive insights. For example, "How might we reduce demand for elephant ivory?" or "I wish I knew why our demand-reduction strategies aren't working."

- **I feel like we keep coming to the same conclusion about where there is leverage for our problem. Are we doing something wrong?**

  Often, the problems we are trying to solve on a Systems Journey are hard. There is rarely an easy solution just sitting there, waiting to be discovered. That said, there are ways to improve a leverage analysis. First, return to your problem statement. Have you been working on the same area of leverage and still are not seeing change? Try bringing new people with different perspectives into the process, or introducing new tools or approaches to help you think differently. It also may help to bring in a trained facilitator who can (a) probe using qualitative approaches in new ways or (b) use quantitative tools that can surface emergent behavior in the system that you may not have already detected.

- **Deep leverage points, such as changing a mindset or goal of a system, seem impossible. Can't we just work on the easier, quick wins?**

  The temptation to address shallower leverage points (which are often more tangible and quicker to change) can be great, but systems theory has taught us for a long time that working on these leverage points alone will not be enough to create truly transformative change and could even make the problem harder to solve (check out the Fixes That Fail system archetype, p. 75). This doesn't mean there aren't tangible ways to address deeper leverage points though! As you move toward creating theories of change and action in the next step, make sure you continue to find ways to challenge your assumptions and widen your perspectives. Sometimes finding new ways to tackle deeper leverage points involves stepping out of our comfort zone and engaging others that we may not be used to working with as allies or partners.

Tools referenced in this chapter

- **Scenario Planning**
- **Semi-structured Interviews**
- **Systems Mapping**
- **Three Horizons Framework**

Boxes in this chapter

- Community-based conservation as a deep leverage point
- Uncovering hope as a leverage point for change

Tables in this chapter

- Table 6: Examples of deeper leverage points in a system
- Table 7: Common systems modeling approaches and their uses

Step E: Developing systemic theories of change and action

"THERE IS NOTHING AS PRACTICAL AS A GOOD THEORY."

—CAROL WEISS

OVERVIEW

Overview

- On a Systems Journey, we distinguish a theory of change from a theory of action. A **theory of change** is an understanding of how change happens irrespective of our actions, while a **theory of action** is how our individual and collective actions might catalyze a theory of change.
- Distinguishing between the two helps us stay grounded in where we have the capacity to create change and be able to iteratively adapt the actions we take for creating change.
- Developing theories of change and action involves developing (1) a **guiding-star**, (2) one or many **theories of change** that describe how change might unfold to realize the guiding-star goal, (3) shorter-term **outcomes** used to inform the actions we take today, and finally, (4) brainstorming actions that will help us realize our outcomes in service of our guiding star.
- Iterating on our theories of change and action involves stress-testing actions against a theory of change and potential futures to help prioritize what actions have the greatest capacity for creating change.
- At the end of this step, we have a set of products to support efforts in **Phase 3: Learning Our Way Forward.** Keep these products in simple forms so you can easily use and adapt them as you move through your journey.

Common outputs from this phase

- Theories of change and action in any form (e.g. statements, diagrams, images)
- A guiding star and a set of nearer-term outcomes
- List of possible actions and theories on how these actions might catalyze change

Common capacities cultivated in this phase

- How to distinguish a theory of change from a theory of action
- Capacity to distinguish a guiding-star goal from a nearer-term outcome
- Capacity to challenge assumptions underpinning theories of change and action
- How to stress test actions for creating systems change

As we come to the end of this phase, we are ready to bring together what we've done previously in **Phase 1: Engage** and here in **Phase 2: Explore** to explore how change might happen, and what we and others could do to catalyze it. In the past, mission-driven organizations have leaned heavily on the concept of a *theory of change* to clarify thinking on both of these steps. As a result, the term "theory of change" is deeply ingrained in the language and culture of many organizations and agencies, and theories of change are often required to secure funds from donors or leaders. Thus, in this guide, we leverage this existing momentum around theories of change and introduce a disaggregated definition that recognizes the importance of both a *theory of change* and a *theory of action* (see Dhillon and Vaca, 2018) for exploring how change may happen and identifying actions that can create systems change.

Theories of change and theories of action

Distinguishing a theory of change from a theory of action is relatively new. We learned in **Phase 1: Engage** that we are only one small part of the systems within which we live and work. Separating how we think change happens more broadly from where we have the actual capacity to influence change keeps us grounded in the realities of what is possible (and upon which we can make real, tangible progress!), while still staying open to chances for catalyzing game-changing transformations. It also keeps us from becoming too attached to specific actions, especially when they don't work. It focuses us on the system behaviors and structures we want to change (our "theory of change" for the world) and helps us iterate more quickly on the actions that can catalyze change around areas of leverage. In this guide, we define these two terms as:

Theory of change – a theory (or hypothesis) of how and why systems change occurs, irrespective of any planned actions. Theories of change lay the pathway(s) for how change is likely to unfold, given our current understanding of the system and its past, present, and possible futures.

Theory of action – a theory (or hypothesis) of how our planned actions may propel a theory of change to achieve the desired outcome(s). Theories of action are more tangible and specific, and take into account our sphere of influence and control (see Spheres of control, influence, and interest, p. 119).

This distinction disentangles the actions that we intend to undertake from the broader change that may happen in the world with or without our help. It also helps to remind us that there can be many actions that catalyze or activate change, which might occur as direct or indirect results of our own work. This keeps our changing understanding of the system alive and adaptable as we learn and adapt later in Phase 3. Here, we provide examples of theories of change and action together with a *guiding star* goal (introduced below).

How to develop theories of change and action

To develop theories of change and action, we move from thinking broadly about how change happens, to being very tangible and specific about the actions we might take in the short term to catalyze change. To do so, we follow and iterate in three steps:

1. Define a *guiding star* and explore theories of how change might happen
2. Identify shorter-term "nearby star" outcomes and brainstorm actions that we can take to catalyze change
3. Stress-test actions against your outcomes, theories of change, and possible futures

1. Define a guiding star and explore how change happens

Define a guiding star

It's easy to fall into the trap of setting concrete goals early in the journey before truly understanding the role we can play in creating change. We become bound to these goals and hold ourselves and others accountable to a statement or target that in all likelihood, was conceived quickly by a homogenous group of people and may or may not be realistic or achievable. So, it is only now — after we have **engaged** and **explored** the system with others — that we identify a vision we want to work toward.

To begin, we start with a *guiding star*: a goal or vision that you orient toward on your journey (The Omidyar Group, 2017). Your guiding star does not need to be SMART (specific, measurable, actionable, realistic, time-bound). On the contrary, it can be broad and fuzzy. It's the "why" behind the work, and like a compass, it steers you and others toward the vision you're aiming for. Your guiding star will emerge from your understanding of the system, hopes for the future, and the areas of leverage you've identified, to articulate a shared vision or value that you and others will work toward.

Use what you already have to set your guiding star. The Omidyar Group (2017) suggests thinking about a guiding star with this template: "Our guiding star is a [name of system] that produces [desired condition]" (see Sample theories of change and action, p. 117). You could be a little more specific, based on what makes sense for you and the type of journey you are on. It matters less what format the star takes, and more how you use it in the future.

Explore how change happens to develop your theory of change

Earlier, we defined a *theory of change* as a theory of how change happens in the world, irrespective of our actions. Now that we have a guiding star toward which we are orienting,

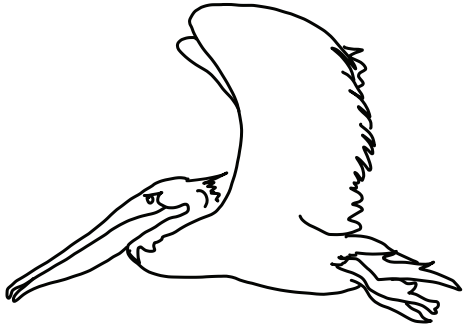
we can explore how based on our understanding of the system, changes to areas of leverage and one or many of the futures we have envisioned.

A critical part of creating a theory of change is interrogating the assumptions we have about how change happens. As Michael Patton, leading thinker and practitioner on program evaluation, once said, "The idea was never to just get a bunch of people together to share... biases and fabricate a theory of change out of thin air." So when developing your theory of change, it's important to ensure it reflects the different perspectives of those in your system. Be sure to note where opinions diverge.

This is also a good step in which to challenge assumptions around how change might happen. This can be done in several ways. You may choose to have an assumption "parking lot" (e.g. within recurring meeting notes or on a whiteboard during a workshop) where assumptions are recorded as they are raised in the flow of conversation. You can also add them directly to artifacts from tools used earlier (for example, a virtual or physical systems map or drawing).

You can then start to question these assumptions: Why do we think this is true? What evidence do we have that backs up these assumptions? And if we don't have evidence, what theories, disciplines, or perspectives could help us understand them better (see next page, What happens if I don't know the answer?). You can also step back and interrogate assumptions about the broader context using the **Iceberg Model** to probe mental models you and others hold about the system. These can help answer the question, "What must be true about the world in order for this kind of change to occur?" This can, in turn, lead to rethinking and iterating on your theories of change, or may prompt you to look for input or expertise elsewhere that ground-truths your assumptions with other types of evidence or knowledge.

What form your theory of change takes will depend on your journey to date: it might be a series of short statements, simple annotations on a **Systems Map**, a visual created by **Visualizing Situations and Change**, or any other products resulting from Steps C and D above. Don't get too attached to the form at this point — it will evolve and change as you move through this step.



What happens if I don't know the answer?

Surfacing and describing assumptions is not about being 100% certain or accurate. It is a process to explore where our boundaries of knowing and understanding lie. When we come across assumptions for which we have limited evidence or experience in that particular part of the system, it is a great opportunity to learn. There are several strategies that can be taken to help better understand assumptions:

1. Building in research or analysis on the assumption to see what evidence exists. You can turn to many experts from different scientific disciplines to help here, including:
    a. **Systems transition theory**, which helps us understand how we work at multiple scales for change (Geels, 2011).
    b. **Co-production of knowledge**, which helps us understand how we work with others to understand the world and create knowledge, and its role in making change in the world (Norström, et al., 2020).
    c. **Psychology and behavioral sciences**, which help us understand what leads to human learning and changes in behavior (Schwerdtner Máñez, et al., 2020; Rare and the Behavioral Insights Team, 2019).
    d. **Systems thinking and system dynamics**, which identify frameworks that help us understand the patterns in our systems and where to intervene to change the way they work[2] (Meadows, 2008; Stroh, 2015).
    e. **Social change theory and sociology**, which can help us understand how our social structures evolve and change, and how history shapes that change.
    f. **Social-ecological theory**, which helps us understand how our systems move through or exhibit behaviors that let us know they are more or less resilient (Folke, et al., 2005; Ostrom, 2009).
2. Seeking out partnerships or connections with other people and organizations who might offer different perspectives on specific parts of the system
3. Expand your core team and bring in new expertise and perspectives
4. Ensure that exploring any unknown assumptions is a key part of any experiments you may try as you learn your way forward.

Each of these strategies might be right in different circumstances. Importantly, you have options to move forward and account for uncertainty. Being honest about your assumptions is critical for effective learning and adapting when we reach Phase 3.

---

2 The Art of Systems Change, pp.19-30

But what do they look like? Sample theories of change and action

Imagine a system where a fictional NGO is trying to catalyze change around wildlife protection and management. After engaging and exploring the system, the team identifies their guiding star to be, "A future Elephantland [name of the system] where elephant populations and other wildlife have stabilized [desired system state]."

Based on their understanding of the system, possible futures, and areas of leverage, they start to theorize how change might happen. Their theory of change could be something like: "To counteract declining elephant numbers, we believe that increasing the value of elephants to local communities through ecotourism will reduce poaching and encroachment on elephant habitat." The theory of change may build on an existing **Systems Map** or visual output from **Visualizing Situations and Change** to show how the relationship between ecotourism and elephant populations could change. After identifying this theory of change, they may challenge their assumptions about the potential impacts of increased tourism, considering the threats from increased traffic, waste, and food consumption. Finally, after some generative brainstorming, they identify a theory of action like, "We will increase tourism by facilitating a joint venture between private-sector partners and communities and increasing destination marketing, while simultaneously working with local communities and government officials to set in place sustainability standards that ensure the tourism industry doesn't negatively impact elephant populations in the long term."

A theory of action can be designed to tackle both leverage points and features of the system where unintended consequences may be likely to manifest.

In this case, separating out the theory of action (how developing infrastructure will catalyze change) from the broader relationship between economic value and elephant conservation prompts more nuanced conversations around what assumptions are being made about how change happens in this system and how our actions might catalyze it. In this case, there is evidence of the relationship between the economic value of wildlife and the stability of elephant populations, yet there is also a risk that uncontrolled tourism could backfire in the long term and adversely impact the ultimate goal to improve wildlife populations. This kind of disaggregation also sets the team up to design a system that can help them learn their way forward (Step F: Sensing systems change, p. 129).

2. Identify a short-term outcome and brainstorm actions

Identify an achievable outcome

With an initial theory of change, the next step is to identify a near-term *outcome*: a more tangible goal (or set of goals) that will help guide the set of actions you choose to take initially to catalyze your theory of change. An outcome can be a SMART goal – one that is **S**pecific, **M**easurable, **A**chievable, **R**ealistic, and **T**ime-bound. Depending on the time horizon of your theory of change, your outcome might be realized in the near future (2–6 months) or a bit further down the line (2–3 years). It should be clear how you think achieving this outcome can help you and others catalyze parts (or in rare circumstances, all) of your theory of change.

Your outcome is typically found within your locus of control or influence (see next page, Spheres of control, influence, and interest) and should be informed by insights from the possible futures imagined and areas of leverage identified. There can be a strong temptation to set extremely ambitious goals to inspire our funders and supporters, but these often are not grounded in reality or in acknowledgment of dynamics like feedback loops and system thresholds or relationships across different components of a system. Despite their allure, highly ambitious goals can make it difficult to plan, implement, and learn from actions to make realistic progress.

Our systems always contain actors, structures, and deeply entrenched patterns, which we cannot easily influence, be they a current political party, values held by a subset of the population, or just the changing of the seasons. Reflecting on your sphere of control and influence when setting an outcome allows you to see which leverage point you might have more success in addressing easily or effectively, and can help prioritize where to spend your time and energy. This doesn't mean that giving up on trying to change deeply entrenched, problematic parts of the system. But it does help us focus on addressing leverage points in smart ways that harness our strengths. It also gives us a chance to create lasting change over longer periods of time, and to be realistic about the level of effort required, timeframes for change, and what we can be accountable for.

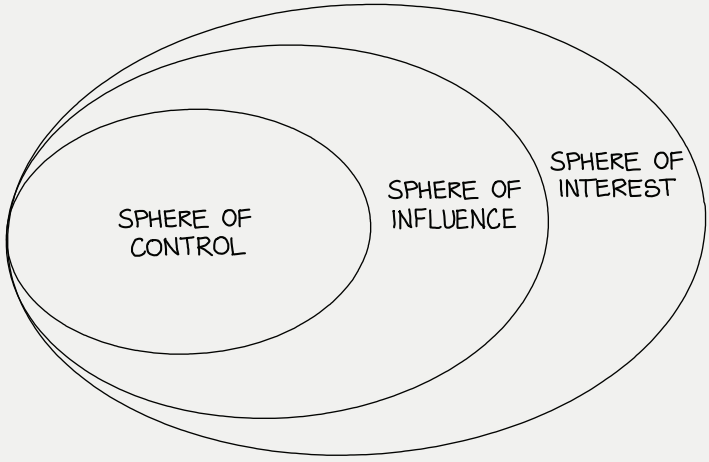
By identifying your locus of control, you can connect the parts of the system you can directly influence with areas of leverage you need or want to address to catalyze your theory of change. Using tools like **Stakeholder Mapping** and **Systems Mapping**, you can discover who has the capacity and authority to change other parts of the system that you and your core team cannot. You can look to your past experience using a **Historical Timeline** to understand what's worked before. Revisiting these with the question, "What is within our power to change?" can narrow down your focus on an outcome that you want to strive toward today, and what actions might help catalyze that outcome.

Similar to your guiding star, your outcome can be a simple statement or a visual. The most important thing is how you use your outcome to identify actions for creating change and later, in Phase 3, how to most effectively sense systems change.

Spheres of Control, Influence, and Interest

The problems we tackle as changemakers can be daunting, and at times, overwhelming. This can lead us to spend our energy in ways that do not serve our own well-being or our ultimate goals. We can use the model of spheres to help separate our *sphere of control* (the things we can directly do something about) from our *sphere of influence* (things we can indirectly shape), and *sphere of interest* (the things that shape our systems but which we cannot control). Use it as a facilitation tool or a thought exercise to be more explicit about how your points of leverage line up to areas of the system where you have control or influence.

This doesn't mean that we stop paying attention to some of the more deeply rooted and problematic parts of our system. Instead, we focus on where change is possible, which should eventually lead us to address some of these fundamental concerns in the long run. Using these spheres as a filter will allow you to spend your energy wisely as you brainstorm actions for change and choose strategies that can reasonably be achieved within the scope of a project or initiative.



Adapted from Discovery in Action "Knowledge Bite," RootChange.org

Figure 2: Spheres of Control, Influence, and Interest

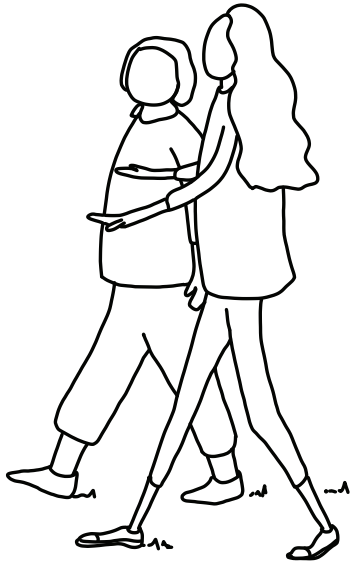
Identify actions that catalyze your theory of change

Actions that help us realize our outcomes and catalyze change do not need to be complicated. A good systemic action or intervention may simply be the right conversation with the right person at the right time, which may have the power to transform underlying mental models about a system, forge new relationships, or build trust. Other interventions might be more complex and require activities that address multiple leverage points simultaneously. The more creativity and careful thought you bring to this stage of the process, the more options you will have to create change. All of the ideas you generate — regardless of which you choose to implement first — become a resource for you to revisit time and again along your journey as you seek to experiment and learn your way forward.

To identify actions that catalyze your theories of change, start with your outcome. What area of leverage needs to change in order to realize this outcome? Which parts of the system need to change to address this area of leverage? How should elements or dynamics in the system be behaving to realize the change you seek? What can you do to create the necessary changes? Refer back to any relevant artifacts created in **Phase 2: Explore**.

Remember the importance of time and scale (Principle 4, p. 37): What behaviors do you see over time? Refer to the **Iceberg Model** and outputs from Step D: Analyzing leverage. Are there feedback loops or archetypal patterns to be aware of or that you can use to your advantage? A **Historical Timeline** can probe which actions in the past were successful, if and how they addressed systems dynamics effectively, and if they could work in other contexts. In addition to classic group brainstorming activities, **Semi-structured Interviews** can identify actions from those who might have experiences or ideas different from yours. Widening perspectives can also shift power dynamics in the system. Especially if you are in a position of relative power, elevating the ideas and hopes of others in true partnership can be transformative.

Creativity is key here. As you make sense of the various perspectives and ideas you could take forward, simple things like changing your physical setting, having a "walking brainstorm" with colleagues and partners or chatting with someone who you might not typically seek advice from or speak to can surface new ideas. Remember, this is the time to generate many ideas while staying grounded in both the realities and opportunities of your system. And finally, be sure not to limit yourself to ideas that are classic "activities" in project proposals and budgets. For example, sometimes simply showing up in a certain place at a certain time, or engaging in a conversation with a particular person in more informal ways (see Principle 1, p. 35) can be a transformative intervention.



Challenging our biases to find actions for change

An ongoing conflict between a national government and communities living adjacent to a national park was intensifying with escalating acts of violence on both sides. The national government decided to convene a meeting with community representatives to try to identify ways to resolve the conflict.

Poaching appeared to be at the root of the conflict. Community members were entering the national park to legally graze livestock, but illegally poaching on their way in and out of the park. The government wanted to find a way to put an end to poaching by restricting park access, while the community members wanted to continue to access their prime grazing land. With these perspectives, the conflict continued.

Facilitated discussions, with careful attention to the power dynamics and growing conflict, helped both groups realize that the underlying values and hopes for the future were similar on both sides. The groups both shared a great deal of respect for nature and recognized the importance of grazing animals. A compromise was eventually reached in which the national park borders were modified slightly to give local community members access to grazing land but did not require them to cut through the national park.

The national park authorities had never entertained the idea of changing the park border, given how difficult it was for them to establish the park in the first place. But they challenged this assumption by engaging in open dialogue with those who they perceived as "enemies." This helped them realize they could resolve the current conflict and build goodwill with the community members if they challenged their ideas about what was possible and right. Changing the border didn't dramatically alter the health of the ecosystem, and instead secured the health of the larger national park by resolving the conflict, which reduced the instances of poaching.

Sometimes challenging our own biases around what actions are impactful and feasible can lead us to unusual actions that may, in fact, deliver the exact outcomes we need.

3. Stress test actions against your theories of change and possible futures

Once you have a list of potential actions you might take, stress testing uncovers the *theory of action* — the theory (or hypothesis) of how planned actions may propel the theory of change to achieve an outcome. Stress testing before committing to a defined set of actions allows for deeper reflection about how actions might catalyze a theory of change before getting too attached to them. Stress testing can also uncover different and unexpected pathways that actions can take in complex systems, and help you to iterate further on your theory of change as well as to sense how the actions you choose to move forward with are creating change (introduced next in Step F).

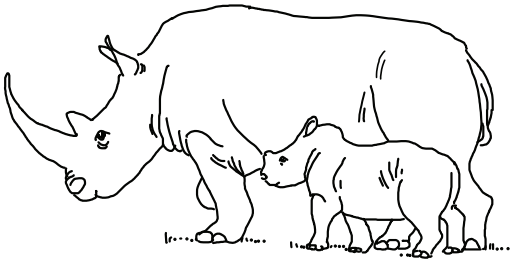
If the outputs from earlier stages were more "qualitative" (e.g., summaries of workshops or narratives about your system), then stress-testing will most effectively begin with a series of self-questions, such as:

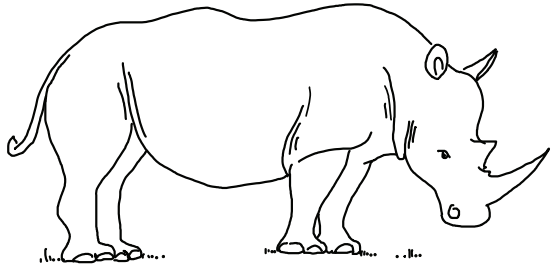
> ***"How will this action impact important things we've talked about before?"***
>
> ***"Does this action address a leverage point in a way that change will last?"***

Visual depictions of the system are especially useful in this phase. For example, maps of system features can keep the system's dynamics at the forefront of discussions and debates. Tools like **Rapid Cycle Prototyping**, **Scenario Planning**, and **Wind Tunneling** can help us stress test with others in interactive ways. For those with the skills and resources, computer-based simulation models (see Complementing discussions with computer-based tools, p. 104) are also useful.

All of these tools are helpful for facilitating questions on trade-offs, but it's rare that there is ever just one optimal solution to a complex problem. So, use the stress-testing period as a chance to have the difficult but necessary conversation about tradeoffs, together with actors in your system. This is critical for mitigating conflict that ensues as you begin to implement and adapt your actions in the real world.

Stress testing should help you filter out the ideas that should be left behind (based on potential unwanted outcomes or a poor return on investment) and decide which should be priorities as you move toward Phase 3. It is also likely that many actions will fall somewhere between these two extremes. You may find opportunities to quickly pivot your efforts toward other actions. Having a set of ideas that have already been stress tested could be a valuable resource.





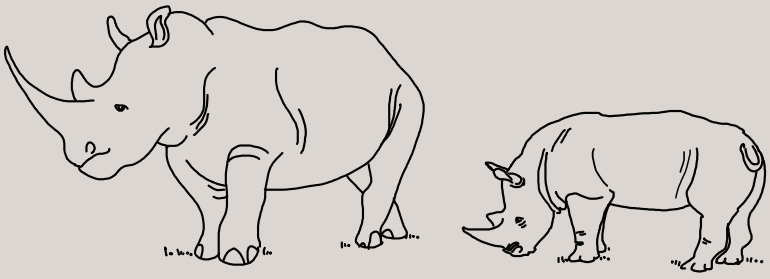
Stress-testing actions for change: trade and biodiversity conservation

A partnership working at the intersection of trade and biodiversity came together for a small working session to explore how to reduce bushmeat consumption in several countries in Africa. Participants included biodiversity conservation professionals from those countries and professionals from other countries with experience in social psychology and behavior-change science.

The team had already spent time understanding the system and thinking about the future and areas of leverage in a series of workshops, as well as out-of-session via research and analysis. In the working session, they sought to identify and stress test possible actions to engage national governments to develop policies targeting bushmeat harvesting and consumption.

After identifying a long list of possible actions, participants used **Systems Mapping** to understand the current system, and specifically interrogate how the actions might create change in their national systems. While creating the map, they discussed the changes that could occur if they were successful in meeting their goals. One example involved exacerbating a feedback loop between young men shifting careers and their feelings of disempowerment, which often lead to increases in gender-based violence. Other possible outcomes discussed included the risk of displacing economic activity from bushmeat harvesting to other unsustainable practices, like timber harvesting. Participants also discussed potential positive outcomes, including creating new feedback loops that would enable new careers and relationships with the national forestry departments and other private-sector stakeholders, as well as how overlooked existing policy and legislation could be used as leverage points to support change.

Using the systems map to facilitate stress testing, participants considered how their proposed actions might play out over time and across different scales. While the process uncovered many factors and dynamics outside of the participants' control, the dialogue around these issues led to creative thinking about how the unintended impacts could be mitigated as they learned their way forward. The exercise also gave the participants a common language to use for the complexity of their initiative. When the COVID-19 pandemic hit a year later, the team already had a sense of which actions they could pivot to given the new and uncertain world they were living in.



Methods of stress testing actions for change

Here we contrast how you might go about stress testing potential actions using qualitative outputs (e.g., workshop reports, interview transcripts, notes from the Iceberg Model) versus quantitative ones (e.g., systems maps or simulation models), depending on which of these outputs you have available. For example, if you recently hosted workshops and carried out interviews but don't have a systems map to work with, you could ask yourself qualitative questions about the information you have compiled to date.

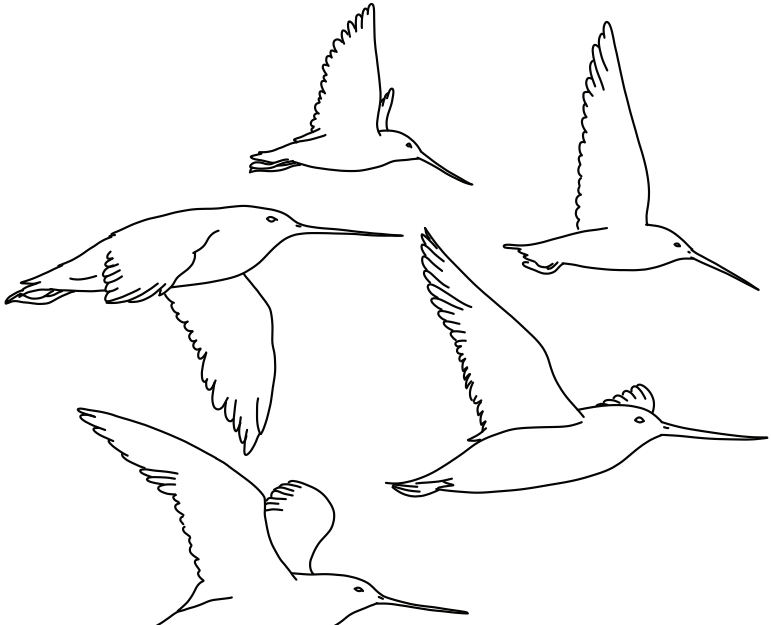
Type of stress testing	**Using qualitative questions** *Ask yourself these questions*	**Using quantitative outputs** *Use your systems diagram or model and follow these steps*
Charting different pathways for creating change in the system	What will happen next after we complete this action? And after that?	Identify the relationships between the components of the system (or leverage point) you are trying to influence, and identify how an action might create change.
Identifying shifts in the system	How will this chain of actions/ reactions influence or change major patterns of behavior, system structures, and mental models? Does this chain of action get us closer to any of our possible futures?	After tracing an action and its impact, reflect on what dynamics and feedback loops could shift as a result of the action. What new feedbacks might emerge? Draw these!
Identifying areas of resistance	Based on these actions and reactions, how might we envision (insert different stakeholder groups) experiencing this change? What kinds of actions might they take in response?	Based on your change pathways, at each connection ask which patterns or structures in the system might prevent this change from occurring? Who in the system wants to see this change? Who does not?
Identifying areas where unintended consequences or "failures" may occur	What other relationships do we think might be affected by our actions? Are there any good resources out there (scientific reports, testimonials) about similar actions that were carried out before? Can we learn from these?	As you review each action, consider and label other potential consequences. Identify which of these are particularly problematic.

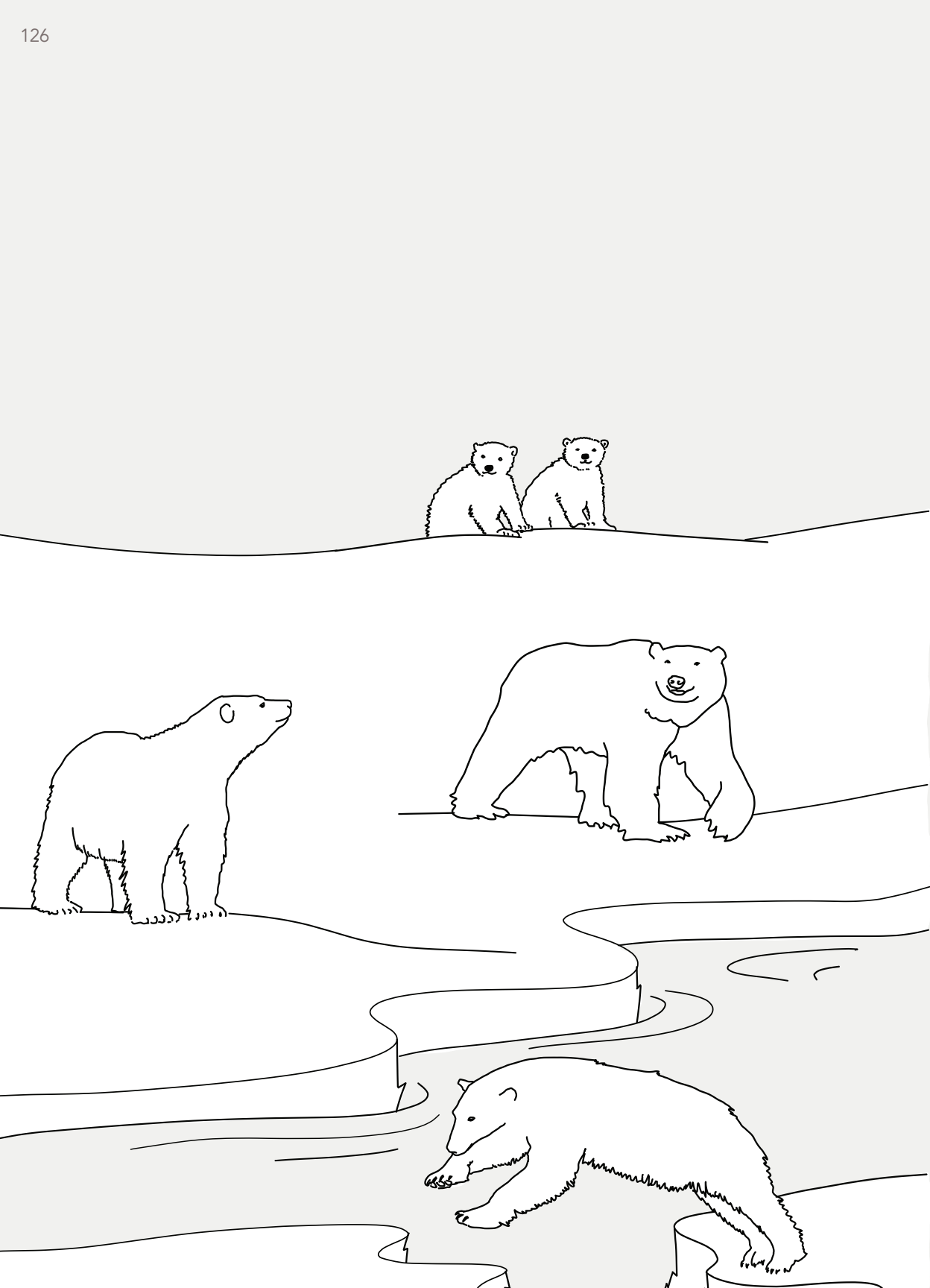
Table 8: Methods of stress testing actions for change

Moving forward

There is no single way to codify your theories of change and action. What matters most is how you plan to use them moving forward. In this guide, we suggest you keep your theories of change and action simple: build out diagrams based on earlier products, or write a set of statements outlining your current understanding of how change happens and what actions you want to take to catalyze that change. If you are required to develop a theory of change for any operational reason, avoid locking yourself into a specific set of actions that might need to evolve and change with your system. All too often, theories of change and action become locked in place (via funding proposals or strategy documents), which can constrain the flexibility that is necessary to really create change. It's important to leave space to review and revise our theories of change and action as our understanding of and role in the system evolves.

As we move forward into **Phase 3: Learning Our Way Forward**, we will intentionally create experiments, large and small, to learn from. What we learn will inevitably bring us back to earlier phases of the journey, challenging our assumptions about the system and our role in it, the future, and areas of leverage, which can lead us to revisit and revise our theories of change and action. "Good enough" systemic theories of change and action are a set of assumptions and ideas that have been ground-truthed and stress-tested well enough that they can inform our first few concrete systems changes.





FAQs

- **I am working with a group that has a hard time thinking about new and different actions for our work. What can I do to prompt creative thinking?**

  Gather the same individuals with the same knowledge to tackle the same problem and you end up with the same solutions. Instead, start by asking if there are individuals or groups that represent different perspectives, who you can involve in your process? Then think about how to engage them respectfully, either bringing them in as full partners or using tools like **Semi-structured Interviews** to slowly suss out different perspectives. If you can't engage others, try changing the setting that participants are in, or invite reflection on other topics they might be passionate about (e.g., hobbies and family). See if "connecting the dots" outside of the problem area can spark creative thinking.

- **What do you do if your theory of change is locked in via a funding proposal?**

  Try to test this assumption. How locked in are you, really? You might try having open discussions with your funder about your broader intentions and guiding-star goal. You might also see if you can create small experiments within the frame of your existing theory of change, which can inform a revised theory of change for your next project or proposal.

- **But what do a theory of change and theory of action actually look like?**

  On a systems journey, there is no single way to write a theory of change and action, so the short answer is: it's up to you! What matters is that your theory of change helps you, your team, and collaborators gain clarity on what kind of change you hope to catalyze in the world. Likewise, your theory of action should help you test assumptions about how you might catalyze that change. You might mix and match different "products" that communicate your theories of change and action to different stakeholders. These could include a brief statement, a slide deck, or a systems diagram annotated with actions. At some point, you might need to transform these simple theories of change into specific products for donors or leaders. But keep your own theories of change and action simple, fluid, and flexible.

Tools referenced in this chapter

- **Historical Timeline**
- **Iceberg Model**
- **Rapid Cycle Prototyping**
- **Semi-structured Interviews**
- **Systems Mapping**

Boxes in this chapter

- What happens if I don't know the answer?
- But what do they look like? Sample theories of change and action
- Spheres of control, influence and interest
- Challenging our biases to find actions for change
- Stress-testing actions for change: trade and biodiversity conservation

Tables in this chapter

- Table 8: Methods of stress testing actions for change

SUMMARY

PHASE 3: LEARNING OUR WAY FORWARD

Step F: Sensing systems change

"INDICATORS ARE LEVERAGE POINTS. THEIR PRESENCE, ABSENCE, ACCURACY, INACCURACY, USE, OR NON-USE CAN CHANGE THE BEHAVIOR OF THE SYSTEM, FOR BETTER OR WORSE. IN FACT, CHANGING INDICATORS CAN BE ONE OF THE MOST POWERFUL AND AT THE SAME TIME, ONE OF THE EASIEST WAYS OF MAKING SYSTEM CHANGES — IT DOES NOT REQUIRE FIRING PEOPLE, RIPPING UP PHYSICAL STRUCTURES, INVENTING NEW TECHNOLOGIES, OR ENFORCING NEW REGULATIONS. IT ONLY REQUIRES DELIVERING NEW INFORMATION TO NEW PLACES."

—DONELLA MEADOWS

OVERVIEW

Overview

- While sensing change on a Systems Journey, we can easily fall into the "accountability trap," in which we measure change in a way that downplays the uncertainty and complexity in the system and underestimates how long systems change can really take.
- Systems change involves (1) reflecting on important decisions you and others make and the questions that you still have about your actions and system, and (2) identifying a useful set of indicators that brings together different types of information over different time horizons.
- It helps to ask questions that ensure progress is tracked on (a) the process of the journey, (b) the results and outcomes, which involves measuring shorter-term "leading" indicators and slow-to-change "lagging" indicators, and (c) changes in the big picture to see how the broader system might be changing, which may shape your current theories of change and action
- When prioritizing what information you might collect, question what the indicators are *really* telling you, what knowledge they draw upon, how they might be used, and if others in your system will perceive the information you collect as credible, salient, and legitimate.
- Getting to "good enough" involves finding a balance between gathering evidence to help you understand progress toward your guiding star and quickly learning and adapting.

Common outputs from this phase

- A list of past and future decisions
- A list of prioritized learning questions and ideas on the evidence you will use to answer these questions
- A set of possible indicators (quantitative and qualitative) to be tracked across three domains (process, results and outcomes, and the big picture)

Common capacities cultivated in this phase

- Heightened awareness about decisions and learning questions
- How to distinguish indicators for process, results and outcomes, and the big picture
- Capacity to discuss trade-offs between indicators, and weave different knowledge types together for decision-making

By the time we reach this phase, we have internalized that a true Systems Journey requires shifting how we work and that this shift is just as important — arguably more important — than what we do in our work. In **Phase 3: Learning Our Way Forward,** we focus on creating processes that will support us as we implement and adapt our actions in the real world. We start by developing ways to more effectively "sense" the change we hope to make in the world using evidence and knowledge.

Sensing real-world change requires creativity. There are often time delays (years, sometimes decades) between our actions and detectable change in the real world. Yet, sensing how the system is changing — in response to our actions and to broader drivers of change — is central to navigating the Systems Journey. This paradox is not new. In 2010, the former the Head of USAID[1] remarked that "those development programs that are most precisely and easily measured are the least transformational, and those that are the most transformational are the least measured."

The reality is that a conventional monitoring toolkit already contains many (though not all) of the models, techniques, and approaches for sensing progress on a Systems Journey. We just need to think about, combine, and apply them differently, let go of those that no longer serve us, and adjust our collective mindset for measuring and sensing change.

The "accountability trap" & how to avoid it

Many organizations seeking systems change use monitoring frameworks rooted in fiscal or programmatic accountability. They are designed to provide checks and balances on financial expenditure and organizational activities and demonstrate that teams have a plan and know what they are doing. Within these frameworks, it is assumed that, before implementation, we will be able to articulate with confidence all of the actions we must take over the lifespan of the work to achieve our goals, and set accurate metrics that track and communicate our progress.

For many on a Systems Journey, the need to report against a prescribed monitoring framework can be an obstacle to learning and adapting projects and programs with ease. This obstacle manifests in several ways.

First, we feel pressure to downplay the uncertainties involved in our work. As a result, we might use *indicators* that we can measure with precision (even if we know that they are not particularly meaningful or useful in helping us learn) in order to make our progress observable to ourselves, our leaders, and our funders. Second, we are forced to confront the fact that creating systems change often takes more time than we have, and requires shifts in processes that are beyond our control. This leaves us wondering how best to measure the changes we seek if there's a risk we will be held accountable for things beyond our control.

---

1 "The Clash of the Counter-bureaucracy and Development," Center for Global Development Essay, published in July 2010.

This challenge provokes a (sometimes visceral) fear that setting the bar too high will result in perceptions of "failure," which can, for example, impact job security or limit access to future funding. So, teams end up channeling most of their energy into monitoring and evaluation that meets the requirements of external funders and leaders, leaving little time, energy, and resources for monitoring and evaluation that can enable us to learn and adapt.

It is possible to navigate past this accountability trap. We can negotiate the license to work differently with a funder or board by, for example, being more intentional about who we are designing monitoring and evaluation systems for, and distributing our efforts more evenly between meeting donor needs and learning needs of others who play different roles in our journey. We can also actively work to change the culture within the institution that we work by encouraging the development of monitoring and evaluation systems that help us acknowledge and learn from failure.

Stories from the field

LogFrame is no longer a dirty word

Many systems thinkers cringe when they hear the word "LogFrame." Short for "Logical Framework," this planning tool was designed to organize a project's activities and expected outcomes. Though often criticized for being overly simplistic and linear, a well-developed LogFrame can, in fact, be a powerful tool.

LogFrames can be valuable in getting specific about how actions lead to change, but too often they are used both as a way to articulate how change happens and as a detailed work plan and sole anchor for monitoring and evaluation. LogFrames are great, but they shouldn't do all the work!

Over the course of two years, partners from 40 organizations around the world developed a collaboration to tackle challenges at the nexus of global trade, equity, poverty, and nature. Starting with a theory of change (that explored how change happened irrespective of their actions), the team moved into developing a LogFrame to solidify their theories of action, which translated into tangible activities and outputs.

In this case, the LogFrame played a discrete role in anchoring discussions around indicators for monitoring results and outcomes and the systems process. The process helped the team better plan investments in data collection and monitoring. With more clarity around what learning questions were most important to them, they identified tools that were fit for their needs — tools that, for example, allowed their globally dispersed teams to collate data virtually using smartphones. It also helped them understand where they needed to invest more in monitoring, where relationships were less known. This was all enabled by a long-term and trusted partnership with a funder who encouraged experimentation and facilitated this kind of learning in their grantee's budgets.

Using these "old" tools with our new mindsets and tools is truly the art and craft of a Systems Journey.

Changing how we use our monitoring toolkits

Effectively sensing systems change requires that we diversify the types of information that we use in our monitoring and evaluation systems, explore how to better track and understand changes in systems dynamics and trends, and more intentionally use this information with others as we learn our way forward. In his book on repurposing evaluation in the Anthropocene, Michael Patton (2020) identifies a suite of principles for evaluating systems change, which argue that effective frameworks for sensing systems change need to:

- **Cross siloes:** draw on information from across sectors and bring actors together across knowledge systems
- **Cross scales:** deliberately design frameworks to capture interconnections across multiple spatial scales
- **Harmonize conceptual opposites:** actively seek information drawn from contrasting perspectives or philosophies
- **Bricolage:** inform decision-making by stitching together methods and approaches with intentions

Throughout the journey, we have started to amass information, knowledge, and evidence that can offer clues about how change is unfolding, which will help us learn and adapt our way forward.

In this chapter, we explore how to intentionally use this information to sense change in the systems around us.

How to sense systems change

As you have followed this journey, you will have developed a strong sense of where you want to go (Step C), the actions you want to take (Step D) and the way you think systems change will happen (Step E). Now, it's time to reflect on how you will gather, track, and use information to **learn your way forward**. There are two steps involved in this part of the process:

1. Reflect on future decisions and learning questions
2. Identify information to support learning and adapting

1. Reflect on future decisions and learning questions

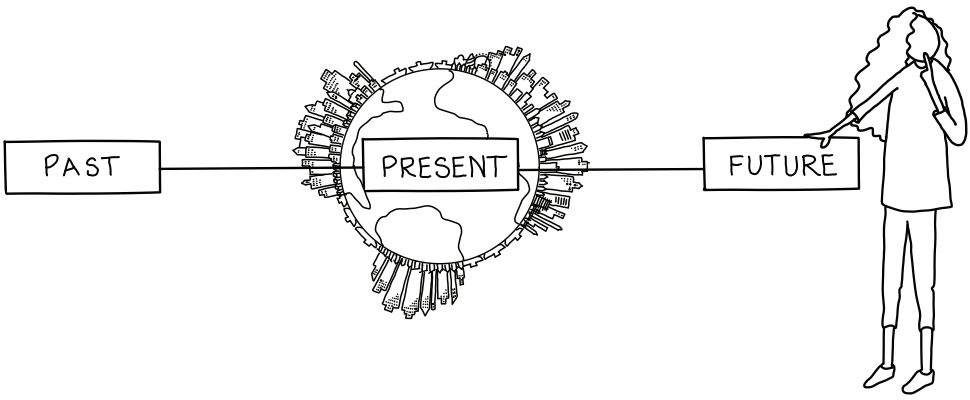
Thinking about how we might sense change in the future helps us to be pragmatic about what indicators and information we prioritize and invest in. There are two steps for this: we first reflect on the possible decisions we and others might make in the future, and then, we reflect on what we need to learn about.

Of course, we cannot predict all of the decisions that might be made, but we can reflect on what decisions we and others might make based on past experience and knowledge of future events. We can roughly sense when we might make them and brainstorm if we will (or could) be involved in making them. We can view these potential future decisions as windows of opportunity to leverage the knowledge we've generated on the journey in creating new pathways for change.

For example, we may know already that we will need to make decisions about (a) when to try a new action, (b) how we implement an intervention (and who with), (c) how we present work to a key partner, or (d) whether we need to collaborate with new actors. We can also sense others' needs, for example, community-led groups who may need to decide how they engage their neighbors in a new program or governments that might make decisions about policies or programs relevant to our work.

All of these decisions will involve different people and organizations, and actors may need information specific to their own decision-making processes. Many of these decisions are also likely steeped in politics and power dynamics. But by thinking about these decisions in advance, we can reflect on what changes we are looking for in a system, what barriers to change may exist, and where the power to bring knowledge and data to the system can help us and others make more informed decisions.

You can make forecasting future decisions easier by playing with time. Reflecting on past decisions can help us sense some of the types of decisions we might encounter in the future.



And using our understanding of possible futures (see Step C, p. 83) we can sense what decisions we might have to make that we've never encountered before. You can make a **Historical Timeline** to note key past events and the decisions that surrounded them. Or use good probing questions with actors in your system.

Looking back:

- What was the most difficult decision made in the last year in our system?
- What was one of the easiest decisions made in the last year?
- Can you identify a decision you made that required input from other people?
- Which decisions had the most impact on your day-to-day work?

Looking forward:

- Based on the possible futures you've identified, what might be one of the most challenging decisions you see yourself making?
- What might be the easiest decision?
- On which decisions might you need input from others?

At first, our assessment of these decisions and their information requirements will be coarse but over time, tracking how decisions are made can help us understand what and when information is needed and the form that information must take. You can use (and invite others to use) the journaling method in **Creative Writing** to track decisions over time. Then, as you implement, reflect on what you wrote to improve your capacity to anticipate different types of decisions in the future.

Another way to anticipate future needs is through *learning questions*. Learning questions are questions that help guide learning around specific aspects of a theory of change or action. They can be used to prompt creative thinking about the unknowns in a project or system. They can also be used to gain insights in **Pause and Reflect** sessions — reflect on if they are useful, focused, feasible, and inclusive (USAID LEARN, 2018; for an example, see next page, Learning questions for sensing systems change).

This concept can be used to help elucidate a range of questions and can also help to prioritize by investigating which questions (1) are critical, need-to-know queries for achieving your and others' visions and outcomes, (2) relate to the key decisions you may need to make, (3) are specific enough to answer, (4) leverage existing knowledge or data you have access to, and (5) are answerable within a timeframe that aligns with key decisions (USAID, 2020).

Learning questions for sensing systems change

A project supporting mangrove conservation in four countries was supported by a funder who had not prescribed any specific monitoring, evaluation, and learning (MEL) approach. This opportunity created a wide-open horizon for the international project-implementation team to co-create a learning agenda and build a MEL system designed to facilitate bottom-up learning across geographies.

While the project was moving into implementation, a group of scientists and facilitators organized a series of meetings with project stakeholders in each country and used learning questions to frame discussions on how each country team individually, and the international project team as a whole, might sense systems change. Each country team had developed a work plan and set of activities for the project, and in parallel, were having deeper discussions around understanding the system and exploring the future within their own teams and with their partners.

Each workshop (convened virtually) involved team members reviewing a systems diagram that had been created using **Systems Mapping**. It translated project documents and work plans into a series of systems maps. These showed the system's dynamics (the theory of change — how the team thought the world worked) with the theories of action from each country overlaid on top. The discussion around the map was focused on ensuring everyone had the same understanding of the system and the project before asking learning questions.

Discussions surfaced key dynamics that were of particular importance in the different countries. For example, one country had a stronger focus on working with the national government and expanded some of the dynamics that surrounded national-level relationships, while another team was much more focused on engagement with community-led groups and discussed the importance of gender disaggregation.

The facilitator used a mix of online facilitation tools, including the conference call chat feature and a virtual whiteboard, to invite participants to share what big questions they were currently thinking about in their work that the project was designed to support. Learning questions were posted to the virtual whiteboard and organized by type: questions about impact and actions; technical questions; and operational questions. The facilitator used the systems diagram to identify areas to probe. For example, the facilitator asked the team specifically about learning questions related to community resilience (a central goal of the project) because most of the questions raised by workshop participants centered only on actions geared at influencing the government, despite there being a range of activities for supporting community resilience building.

"Learning memos" that summarized the learning questions alongside the project's theories of change and action were developed. These were later used as artifacts to guide conversations about prioritizing learning questions and the types of data and knowledge that could be collected to answer the questions. These also helped shape an operational plan for data collection and were designed to guide future **Pause and Reflect** sessions.

Combining the concept of learning questions with Systems Mapping and facilitated discussion helped ground the discussion on understanding the system and exploring the future and challenged the biases that arose during the discussion. Developing clear and easy-to-use artifacts from the process also ensured that insights from these rapid, collaborative meetings were codified and useful in later stages of the project's implementation.

2. Identify information to support learning and adapting

After reflecting on learning questions and decisions, it's time to think about what types of information or knowledge will be useful for learning and adapting. Information is most often thought of in terms of what it can tell you, or *indicat*e. When choosing indicators — be they quantitative measures trackable through time or qualitative descriptions of how change has happened — there is a tendency to focus on measuring the things we do (number of meetings, number of training, etc) and to identify one or more obvious quantitative indicators that can reveal a change in outcomes or the guiding star. This approach offers information that is easy to compile and report, but it rarely gives deep insights into how change is happening in the real world. For example, an intervention designed to promote participation in decision-making in a community could track the number of meetings held or attendees present. However, if you are really concerned with building trust or empowering youth in the long run, it would be more helpful to accurately measure the change in trust and how youth grow up to participate in their communities.

Parkhurst and Preskill (2014) emphasize the importance of asking what, how, and why in evaluation. This can translate into collecting and using information about:

a. **Process (or "the how")** refers to how different actors are working together to create change.
b. **Results and outcomes (or "the what")** emphasize measuring progress in reaching our outcomes and progress toward our guiding star.
c. **The big picture (or "the why")** recognizes that tracking the broader change we see in the world can provide useful context for our work.

Indicators for these domains will be iterative and how they are used will vary over time. For example, a new initiative may at first focus on identifying useful pressures of process. Over time, indicators for results and outcomes can be developed to better track evolving theories of action, and sometimes, elements of our theory of change. Indicators for the big picture can orient us throughout the journey and at key inflection points, and help us take a step back to reflect on how the system might be changing around and outside of the theory of change.

a. Indicators for measuring the process

Monitoring the process involves tracking how we are creating change throughout an entire journey. *Process indicators* that track progress often measure, for example, who is included in a journey; the extent to which a shared understanding of the system has emerged and is sustained among collaborators and actors; the trust among different actors; and the extent of communication and collaboration among actors. Note that many process indicators may later become critical measures for assessing results and outcomes.

Process indicators don't always need to be quantitative metrics; they may initially be tracked informally or formally with information gathered via conversations or **Semi-structured Interviews**. Insights emerge naturally throughout the journey; for example, power dynamics often emerge and evolve during Step B: Understanding the system (p. 59).

b. Indicators for results and outcomes

Results and outcomes are often the most alluring to implementers and donors, as they answer the fundamental question, "What is our impact?" To measure results and outcomes well, indicators must track how the system's dynamics are changing in relation to the outcomes we care about, in addition to ultimate outcomes.

Identifying these types of indicators is much easier said than done. Designing evaluations to track causality is especially hard in complex systems, and sometimes the things we care most about are difficult or controversial to measure. If you created a **Systems Map**, you can trace the different relationships in your map to better understand causality, and assess results and outcomes accordingly.

Use these probing questions (or similar) to guide how you identify indicators to measure results and outcomes.

- *How would you measure success in the long term?*
- *What factors will lead to this success in the shorter term?*

Success in the long term most often involves a change in state or a change in relationships as the theory of change comes true and shorter-term outcomes — and eventually, the guiding-star vision — are realized.

For example, imagine a journey striving to protect elephants. A long-term guiding star may be to increase (or stabilize) the population of elephants in an area or to achieve high management effectiveness of an area. These types of indicators, which measure elephant population dynamics or management effectiveness, are referred to as *lagging indicators*[2], where a change happens tomorrow as a result of actions today. Changes in lagging indicators are slow compared to the actions we take (Ota, et al., 2021) and often because they are the *stocks*[3] in the system. Lagging indicators track change over different time horizons and can measure aspects of both your guiding star and shorter-term outcomes. Use your theory of change and your understanding of the system to identify where these indicators may be most helpful, and get creative when you think about how you might measure them.

---

2 The Art of Systems Change, pp.87-88

3 The Art of Systems Change, pp.19-21 & pp.86-87

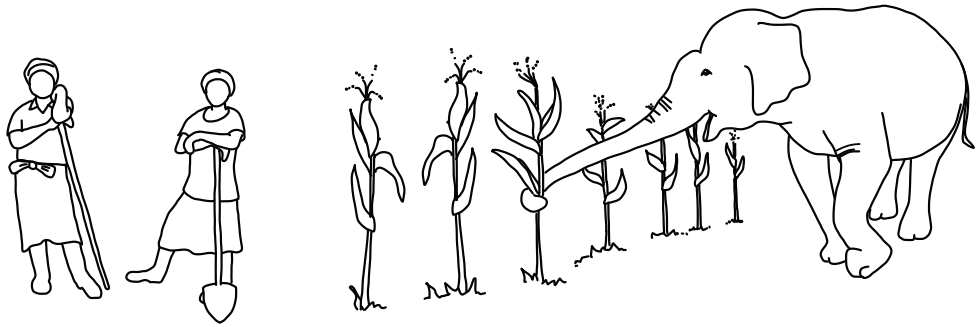
While lagging indicators are often prioritized in monitoring and evaluation, it's important to also monitor *leading indicators*. These indicators measure how our actions today lead to changes in our longer-term outcomes and guiding star. Leading indicators are meant to be predictors of lagging indicators (Ota, et al., 2021). To identify a good leading indicator, focus on the shorter-term changes that indicate progress toward a longer-term outcome or guiding star. These are usually harder to both identify and measure, so it is often here that we fall into the trap of just measuring outputs (e.g., numbers of reports, meetings). Yet when leading indicators are designed well, they can track components of the system and steps in your theory of action that are key for achieving ultimate goals. In the example of elephant conservation, depending on the actions, leading indicators could be designed to assess how community outreach activities changed perceptions toward elephants or the use of personnel-management best practices in a managed area. Changes in these factors would occur far before the lagging indicator of elephant population dynamics and would provide a good signal that we're on track to achieve the goal of stabilizing or increasing elephant numbers.

- *Are there causal relationships in your system fundamental to your theory of change but that you are not sure about? What do you need to measure to understand these relationships?*

Earlier, especially in Step B and Step D, conversations between you and your collaborators likely uncovered parts of the system that are difficult to understand, where the specific causal relationships between parts of the system are either unknown or contested. Often these conversations begin and end there, but sometimes these uncertainties provide a foundation for understanding our problem and the actions we have chosen to reach our goals. When this is the case, it is important to choose metrics that provide confidence in the cause-and-effect relationships in your system. There may be multiple relationships that are uncertain and this might require a discussion about which areas of uncertainty are worth exploring further to validate understanding.

c. Indicators for tracking the big picture

Given the complexity of our increasingly interconnected world, it's important to have some indicators that help you track broader changes in your system, and even changes beyond your system's boundary, to help keep a pulse on the context in which your work is taking place. Some probing questions on indicators for the big picture are:



- *What unintended consequences could result in the system from the actions we are taking?*

It is sometimes argued that an "unintended consequence" is just a change in the system that we did not anticipate, or that we don't desire. These unintended consequences can occur within or outside of the system boundary you have identified. Brainstorming what these potential consequences could be and then tracking the larger picture beyond your system's immediate boundary is important to ensure that you don't miss important factors that could undermine your goals or cause a problem that you would have to solve later on.

You may already have some of these insights from previously stress testing possible actions (potentially using a tool like **Wind Tunneling**). What kinds of unexpected changes did you imagine your actions having? Are the potential unintended consequences significant enough to warrant their own indicator? For example, a conservation intervention may aim to diversify a community's livelihood options to increase resilience to climate change. Increasing livelihood options could introduce new dynamics that have unintended consequences on biodiversity, such as increasing the amount of money people have for hunting or fishing in their spare time. In this case, light-touch qualitative surveys or informal focus-group discussions carried out alongside the project's implementation can track broader changes in the system. The information could be used in real time to indicate changes in the big picture, and help implementers adapt and change the intervention to address unintended consequences.

- *What unexpected events or changes outside the current system boundary could influence your results and outcomes?*

Shocks and stressors driven by climate change and other large-scale system processes will continue to occur and drastically change the world around us. These kinds of shocks can include ones we expect, like heat waves and storm surges from climate change, or less predictable events, like conflicts, inflation, political changes, or pandemics like COVID-19. Keeping tabs on these potential changes and understanding a system's capacity for resilience to them is helpful as you track the big picture. *Resilience* is the capacity of a system — be it an individual, a forest, a city, or an economy — to deal with change and continue to develop (Moberg, et al., 2015). Whether or not you identify sets of indicators to monitor resilience depends on your particular context, but evaluating where your system might be sensitive to external events or shocks is important for anticipating future problems. For example, if your theory of change rests exclusively on one form of economic development (tourism, for example), then monitoring changes in the tourism industry, either locally or internationally, will be helpful to know if you need to change your approach.

Part of your decision in monitoring the big picture may be opportunistic; for example, you may find that one of your collaborators is already tracking big-picture elements that are relevant to your work and journey. Take advantage of these natural synergies!

Bringing it together: A diverse portfolio of useful indicators

After exploring the three domains — process, outcome and results, and the big picture — it's good to take a step back and reflect on the story your set of indicators is telling, how and if your indicators draw on diverse types of knowledge, and how you and others might use the information going forward. Here, again, it helps to ask a few questions:

- *What information do your indicators truly provide? How else could you interpret changes in your indicators?*

Not all indicators are the same — some may be more effective than others in helping us understand the change that is happening in the real world. It can be easy to get caught up in debates on the best or most feasible way to measure a change and lose sight of what you really want or need to learn.

Let's return to the example of elephant conservation from part (b) above. Perhaps this team chose a leading indicator to measure the number of poachers apprehended in order to understand how effective their poaching reduction strategies were in protecting elephants. By asking what this indicator was really telling them, they could discuss the dynamics of the system. An increase in the number of poachers apprehended could also mean that the number of people poaching had increased and they had caught the same proportion as in the past. This might not indicate a positive change in the system for the elephants.

Asking this question throughout the process also brings you back to *how* you might use these indicators and what combination of indicators will give you the best information, either for a future decision you've identified, more generally to inform discussion in a **Pause & Reflect** session, or for decisions about the actions you may try next.

There are also differences in what indicators tell you about the dynamics of systems, in particular how the system is changing. Some indicators can be designed to measure the current state of a variable[4] ("stock"), while others track the rate at which that thing is changing. Both are important but answer different questions. There is no right or wrong here, but it's important that what you measure tells you (1) whether you are progressing toward your guiding star or achieving an outcome and (2) whether your theory of action is having the desired impact. In the elephant example, decreasing the rate of poaching would not necessarily lead to an increase in wildlife numbers, because poaching could still happen faster than the species could recover. Plus, other forces might be influencing wildlife numbers, such as low birth rates or other causes of mortality. It is important to be very clear about what each indicator tells when trying to determine which combination of indicators

4 *The Art of Systems Change, p.87*

will help you understand how the system is working and how successful you are in creating systems change.

- *Who will find the information from these indicators credible, salient, and legitimate?*

The diversity in our world means that evidence and knowledge (compiled in our indicators) can be valued and understood differently depending on who was involved in generating it, who shares it, the methods used to produce it, who might be using it, and how fit-for-purpose it is. As we implement our actions, we inevitably work with diverse stakeholders, which means our close partners and allies may have different ideas on what information we can and should use to learn our way forward.

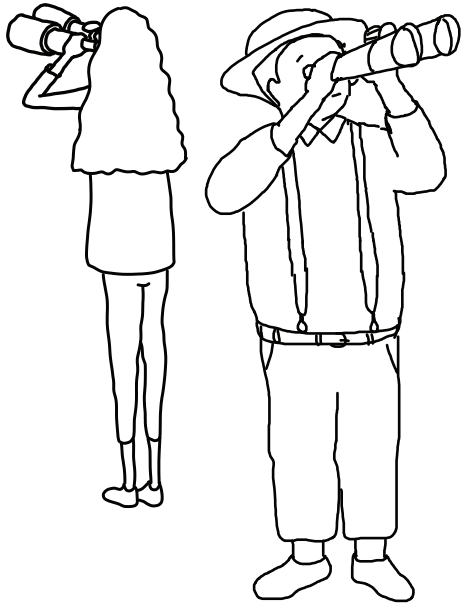
As with all phases in the Systems Journey, creating space for dialogue to explore how different stakeholders perceive the knowledge that we generate and use is critical to ensuring that our monitoring and evaluation approaches reflect the spirit of collaboration and co-creation of our journey. In practice, this might mean ensuring there are time, space, and resources dedicated to facilitating knowledge exchange between different stakeholders. It may also mean ensuring that our indicators measure change in a variety of ways (for example, using practitioner or local knowledge as well as scientific knowledge) and creating a space where different types of evidence and knowledge can sit alongside one another and tell different stories about change (again, possibly in formal or informal **Pause and Reflect** sessions). And for navigators, it might mean paying special attention to the power imbalances (often rooted in colonialism) that might privilege certain ways of knowing over others.

- *How will these indicators be used?*

This is not the first or last time we will ask this question, but before we move forward to Step G: Learn and adapt, it helps to ensure that our suite of indicators makes sense for our priority learning needs and decisions, and the needs of others in our system. This may be a good moment to return back to a **Stakeholder Map** and interrogate the different needs and capacities of actors in your system. You could also use a **Historical Timeline** to think about how decisions have been made in the past and how you might ensure the right information reaches the right audiences at the right time. For example, there might be people in your system who need information in certain forms at certain times, such as a national government designing a monitoring system to meet the needs of a policy – utilize these natural opportunities. Also ensure that you keep space and time to consider any competing needs in your system before making a final decision on which indicators to prioritize. The answers are never easy and there are always trade-offs. Considering these trade-offs and who they impact will be critical to effectively and equitably sensing systems change.

Moving forward

To sense progress on a Systems Journey, we don't need to abandon all of our previous data sources, indicators, or monitoring and evaluation techniques. Many can be repurposed to effectively track a broad suite of metrics that provide useful information. Repurposing these tools requires careful attention to ensure that we are actively using them to detect changes in systems dynamics and facilitate dialogue around perceived and actual changes, rather than defaulting to measures that deliver static and uniform snapshots. Getting to "good enough" at the end of this step involves finding a balance between investing in indicators that help you understand progress toward your guiding star while also helping you quickly make better decisions, learn, and adapt. No matter how our monitoring frameworks evolve as we progress on a Systems Journey, to meaningfully inform the direction we take, we must find ways of using the evidence generated into the decisions needed to *learn and adapt,* which we explore in the next step.



SUMMARY

FAQs

- **How do I choose which indicators to invest in?**

  We can't measure everything that we (and others) think is important, so prioritizing indicators requires honest discussions around trade-offs. It's helpful to query what key information you (or partners) need to make decisions. Often indicators are chosen on principle ("We know this is important, thus we must measure it"), but if changes in that indicator don't specifically inform your own and others' decisions then it is not that useful. Remember, you also have the freedom to go deeper with some indicators (for example, invest in quantitatively measuring a feedback loop over time) and stay light-touch on others (for example, with an imperfect indicator that uses secondary data that keeps an important concept at the forefront of future discussions).

- **What if I don't know how to actually measure the indicators I chose?**

  It may be that some important indicators just aren't possible to measure quantitatively or that you don't have the capacity to measure everything that you would like to. Humbly acknowledging our limits is part of this process! Are there other people or organizations interested in these indicators who could help or even others already measuring them that you could collaborate and share with? If the indicator seems too hard to measure quantitatively, are there ways you could keep track of it that are in reach? A short survey at the end of a meeting or workshop to gauge trust, for example. Remember that getting the value of the indicator (for example, there are 10 whales) is often not as important as the trend (there are fewer whales than last year).

- **I realize that changing things in my guiding star will take a long time. How do I keep momentum or generate support for long-term progress?**

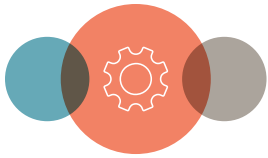
  Bringing the systems knowledge you've gathered and analyzed into contexts where decisions are made and choosing useful indicators on the change process and achievable leading indicators can help you and others sense the progress you are making on a journey. We talk more about how to intentionally design experiments to do this in Step G: Learn and adapt. In short, it's helpful to stay grounded in what information is telling you. Focus on how it can improve the next steps you take. Remind yourself and others that fostering transformations in systems is hard; if it was easy, it is likely someone would have done it already!

Tools referenced in this chapter

- **Creative Writing**
- **Historical Timeline**
- **Scenario Planning**
- **Semi-structured Interviews**
- **Systems Mapping**
- **Three Horizons Framework**

Boxes in this chapter

- LogFrame is no longer a dirty word
- Learning questions for sensing systems change



Step G: Learn and adapt

"SOMETIMES ALL YOU HAVE TO DO IS ASK A GOOD QUESTION...A GOOD QUESTION IS ONE MOTIVATED BY GENUINE CURIOSITY OR BY A DESIRE TO GIVE SOMEONE ELSE A VOICE. QUESTIONS CRY OUT FOR ANSWERS; THEY CREATE A VACUUM THAT SERVES AS A VOICE OPPORTUNITY FOR SOMEONE."

—AMY EDMONDSON

OVERVIEW

Overview

- Systems Journeys are very much about changing *how* we work. Be aware that there are likely many system structures and processes (e.g., organizational processes, funding structures) that could inhibit your capacity to do this. Keep these in mind, and if you can, try to change them!
- Look for entry points to return back to different phases of the journey, so as to continuously challenge assumptions about how and why change happens and to continue to open the journey to others.
- Letting certain old habits go and creating new ones can help you work more adaptively. These include (1) developing real-world experiments and (2) creating space for learning and making it routine. This can foster *double-loop learning* and encourage you to ask *powerful questions*; and finally, (3) raising awareness of *cognitive biases*, which can help us as individuals (and organizations) routinely challenge our own assumptions about how the world works.
- Learning is only meaningful if it helps us *adapt* how we present ourselves in our work with others, and the actions that we take. Be prepared to change.

Common outputs from this phase

- Revised work plans
- Revised theories of change and action
- Insights from experiments
- New sets of experiments for implementation
- Stronger, more trusting relationships with system actors

Common capacities cultivated in this phase

- Capacity to design and implement experiments
- Understanding of *cognitive bias*
- Navigating the fear of failure
- Ability to reflect and adapt

In the rush to implement, it becomes increasingly hard to create the time or have the mental energy to stop and reflect on why we're doing what we're doing. Or if what we're doing even makes sense anymore. Stress distorts the calculation of risk and reward. We might not have time to read the growing stack of interesting reports and papers that could challenge our assumptions about the actions we are implementing. We might lose the momentum to reach out to others who could offer different perspectives and challenge our carefully articulated work plans. New insights, which emerge through the learning questions we've prioritized and the indicators we've chosen, seldomly shape our work plans and budgets without intentional action. Cognitive biases and social norms nudge us away from questioning assumptions, challenging others, or following through on answers to tough questions.

Despite this seemingly bleak picture, there are, in fact, many entry points (p. 23) and opportunities hidden in our day-to-day work where we can slow down, listen deeply, and learn our way forward — if we train ourselves to look for them. Shifting how we work also requires individual and cultural shifts around failure, which can be powerful mechanisms for uncovering insights about how the world works, or the impacts of specific actions. Effective learning requires recognizing these cognitive biases and structural challenges, and then creating the time and space to process and respond to information differently. This chapter will show you how to foster that intention by (a) creating real-world experiments, (b) making time and space to learn, and (3) raising awareness of cognitive biases.

How to learn & iterate

1. Create real-world experiments

One place where there is a high likelihood of *path dependency* — especially in the non-profit sector — is the start of project implementation, after proposals are approved and budgets are unlocked. Many proposals require detailed plans of action and timelines, and how actions will add up to deliver concrete results. Those plans are often taken verbatim and turned into work plans that are implemented and against which success is measured. These proposal documents are often written with (but many times without) system actors who have a stake in the outcomes. So, we feel (and oftentimes are) bound to deliver on exactly what was promised in the proposal. But if the Systems Journey teaches us anything, it's that the world is uncertain and change is never guaranteed. So an ethos of learning and adaptation is required at every step of the journey — especially when we are implementing.

When developing theories of change and action, we learned how to carry out small experiments through stress testing (p. 121), using tools like **Rapid Cycle Prototyping**. These helped us understand whether our ideas could be effective. This ethos of experimentation should follow us into implementation. When developing the operational plans, especially implementing new actions or tried and tested ones applied in new contexts, it can be helpful

to think of actions as pilot projects or experiments. This explicit mindset can encourage learning and adaptation.

All experiments must begin with an intent to learn that is shared by all those involved in the experiment. This initial intent is critical for ensuring participants are in the *learning mindset*, which shapes how receptive people are to new ideas and insights. The experiments themselves can take many forms. For example, an experiment could be designed to address a specific learning question (see Learning questions for sensing systems change, p. 136), or an intervention could be tried in one location or with one partner that has resources dedicated to gathering feedback and information post-action (see USAID, 2013 for a guide to facilitating an "After-Action Review"). Actions could be marketed as experiments and other stakeholders and partners could be invited to take part in or watch these unfold to foster rapid learning and knowledge exchange.

How an experiment ends and what we take away from it is just as important as the experiment itself. The goal of experimenting is to foster learning and adaptation, so if an experiment doesn't go well, it is critical to ensure that information gathered on the how, what, and why (see Indicators for results and outcomes, p. 138) of each experiment is channeled into deciding what comes next in the journey. It's important to remember how personal this might become. It's often the case, especially for those striving to make positive change in the world, that people invest lots of personal time and energy into creating and implementing new interventions. If experiments end up being unsuccessful, especially around "favorite" ideas or actions, the failure will likely feel personal and be difficult to grapple with. Before taking your next step, create the space to acknowledge any feelings of loss or grief that come up when experiments don't go as planned[5]. Equally important is ensuring infrastructure is well designed for scaling up successful experiments. This might mean setting aside financial resources or turning to your network of system actors to support future scaling. **Pause & Reflect** is useful here. You also want to ensure that work plans are adapted based on the lessons learned in order to make space for scaling up or phasing out the actions that were tested in the experiment.

---

5 See Mindfulness Group Practice, The Art of Systems Change, p.128

Tips for real-world experiments

- When starting a new project, write a work plan for yourself that is different from your project's proposal. This creates a safe space in which to be honest with yourself about what you're doing and why, paving the way for real learning. It can also help you avoid the *status-quo bias* (when it's easier to stick with what you said you would do instead of pivoting away from activities that are proving to be ineffective).
- Cultivate the intent to learn. Experiments are explicitly designed for learning. You must be in the right headspace and feel safe enough to be vulnerable and accept failure if it happens.
- Be explicit about which of your actions will be experiments and then allocate and invest sufficient resources in the data and knowledge that will help you learn and adapt your next steps. Be sure to collect information on all three of the domains introduced in Step F: the systems-change process, the results and outcomes, and "the big picture."
- Have honest conversations with colleagues who have expertise in human rights, risk management, and legal issues to figure out how you can safely push the boundaries of your system.

Experimenting in the real world

A conservation project had just been funded to support a wildlife ranger program. Early on, the project team hired a facilitator for a workshop designed to understand the perspectives of local stakeholders in the region where the project would be implemented.

During the workshop, participants used the **Iceberg Model** to understand the history and context of the wildlife ranger program. This discussion helped the conservation project team learn about an older system of wildlife management that had been successfully implemented and managed by local stakeholders. The system itself was relatively simple, effective for decades, and inexpensive to implement.

This led the workshop participants to explore the possibility of reviving this older system instead of adopting the new program that they proposed to bring to the area. Using **Rapid Cycle Prototyping** to explore the potential outcomes of this pivot, workshop participants used materials they had available given the change of plans (in this case, school chalkboards) to map the changes the new program could create. Many of the questions that the Rapid Cycle Prototyping exercise surfaced focused on who would have the authority to enforce rules. These insights helped inform the operational structure and key actors to be involved in a pilot program that would re-established the old system in 20 villages.

Originally, the conservation project was designed to be a large, multi-million dollar endeavor. The pivot away from a costly, externally driven project toward a simple, bottom-up solution reduced the cost significantly, while still achieving good outcomes. And giving back money, which can seem counterintuitive for those who work at NGOs, actually helped build trust with the donor for future projects!

The Rapid Cycle Prototyping exercise helped foster a *learning mindset* within the group, which made designing the initial roll-out of the intervention as an experiment a lot easier. Implementing the project first as a pilot helped residents observe the first-hand impacts of the project, which in turn facilitated the scaling of the intervention later on. This approach to scaling — starting with a small experiment for informal engagement with and support for the ranger program— helped the conservation team avoid the more complex and costly process that often comes with soliciting support for large-scale programs. Local buy-in for the intervention was strong given that many had already experienced and witnessed the project's benefits. Local stakeholders also had much more ownership over the intervention, as it was built directly on a historical way of working that had been designed and implemented by their own community.

2. Create space for learning

Decision-making is often an opaque process influenced by individual cognitive biases and the structures of the organizations and systems in which we operate (Tanner, et al., 2020). Simply detecting that it's time to slow down and reflect on our progress, critically challenge assumptions, or even make a decision about the path ahead, can be difficult. There are two

(not mutually exclusive) ways to tackle this: (a) hold space for learning, especially around important decisions and (b) make learning routine.

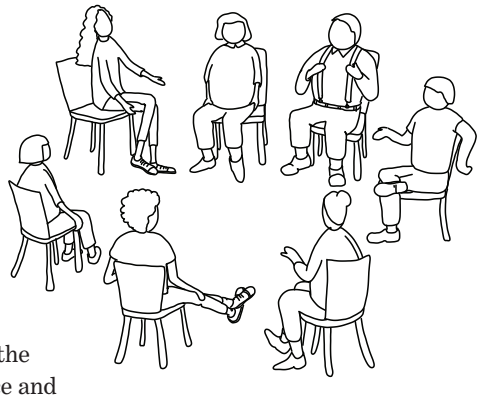
In Step F: Sensing systems change, we started to identify some of the decisions we may need to make on our journey. As you develop operational work plans, hold time around these forecasted "decision points" and create a forum (for example, a call, a dinner, or a workshop) to ensure that the right people and knowledge can shape those important decisions. During these moments, think about how you might share or integrate the information you are collecting on the systems change process, as well as the results, outcomes, and the big picture (see Indicators for tracking the big picture, p. 139). Some may be obvious opportunities, like an annual board meeting or a shift in government. Others may be less clear, like choosing when to pivot away from a planned approach that may not be working effectively. If not already compiled through your monitoring system, many of the tools in this guide (such as the **Iceberg Model**, **Visualizing Change**, and **Systems Mapping**) can help you gain a rapid understanding of how others are perceiving change, which can, in turn, be used in a **Pause & Reflect** session to inform a decision.

Keep challenging assumptions

Assumptions are, by definition, things that we believe to be true. As a result, we rarely express them. This is particularly true when we spend most of our time with people or organizations who think like us. By crossing boundaries and making our assumptions explicit, co-creation can have a real impact.

In one workshop, people from all around the world who represented different areas of expertise came together to explore trade and biodiversity in urban and rural places. The participants were both new and long-standing members of a global project, and the goal in this particular meeting was to refine existing theories of action to catalyze a theory of change addressing global trade dynamics to protect biodiversity.

In one session, participants were discussing a region inside one of the countries where their program was operating. Using **Systems Mapping**, participants ended up having a long discussion about the assumptions underpinning the relationships and feedbacks within the social and cultural systems in that country. As many of the participants represented different disciplinary fields and cultural backgrounds — within and external to that country — it took time for them to agree on a shared set of relationships for the systems map. Having these diverse perspectives in the room when talking about one particular region helped most of the participants revisit their assumptions about a set of social relationships, which led them to revise their existing theory of change and action. It was a lesson in humility for many in the room, and participants recognized that no single person had a full perspective on the system despite considering themselves "experts" on the issues they were addressing. This humble realization led to a much stronger and more targeted theory of action to inform the start of the project's next round of funding.



It's impossible to anticipate all of the decisions we will make on a journey, so an important complement to planning for future decisions is scheduling regular **Pause and Reflect** sessions. In these, the actors from a journey come together to review progress, emerging insights, and information, and critically appraise assumptions. These routine sessions can gradually build the collective habit of learning with different types of evidence and knowledge and help to identify what types of decisions are being made and when. These sessions can be short (less than 30 minutes) and relatively frequent (multiple times a month), a standing agenda item in a regular meeting, or to be more inclusive, a bi-annual or annual dialogue with actors in your system (see more in **Pause and Reflect**, p. 225). Depending on the monitoring information you collect and the frequency with which that information is updated, reviewing the emerging data can become a routine part of these sessions.

Pause and Reflect sessions must be facilitated well so that participants make a distinct shift from "doing" mode into "thinking" mode (see below, Figure 3: Single and double-loop learning). A few deep breaths, a walk outside, exercise, meditation, or a change of location can all create the mental space necessary for reflection, learning, and adaptation to occur. This gear-shifting is important if we are to move beyond simply asking what happened to deciding what to do next (*single-loop learning*), to a more reflexive process (*double-loop learning*) in which we critically (but not judgmentally) appraise:

- What happened?
- Why did it happen?
- What does that mean for...
  - ...our understanding of how the world works?
  - ...our vision of the future and the actions we might take?
  - ...how change happens, which translates into the assumptions in our theories of change and action?
  - ...how we continue to sense change in our system?
- What should we do differently in the future? How do we adapt? Which assumptions do we revise?

There are many tools, for both groups and individuals, that facilitate this type of learning. **Creative Writing** can help individuals or groups to routinely reflect on progress and assumptions. Formal practices like **Pause and Reflect** sessions (based on the questions outlined above) can encourage groups to reflect in ways that destigmatize failure. But always remember, different individuals and groups may be more or less comfortable discussing failure publicly, given the legacies of historical inequities and structural racism.

Single and double-loop learning

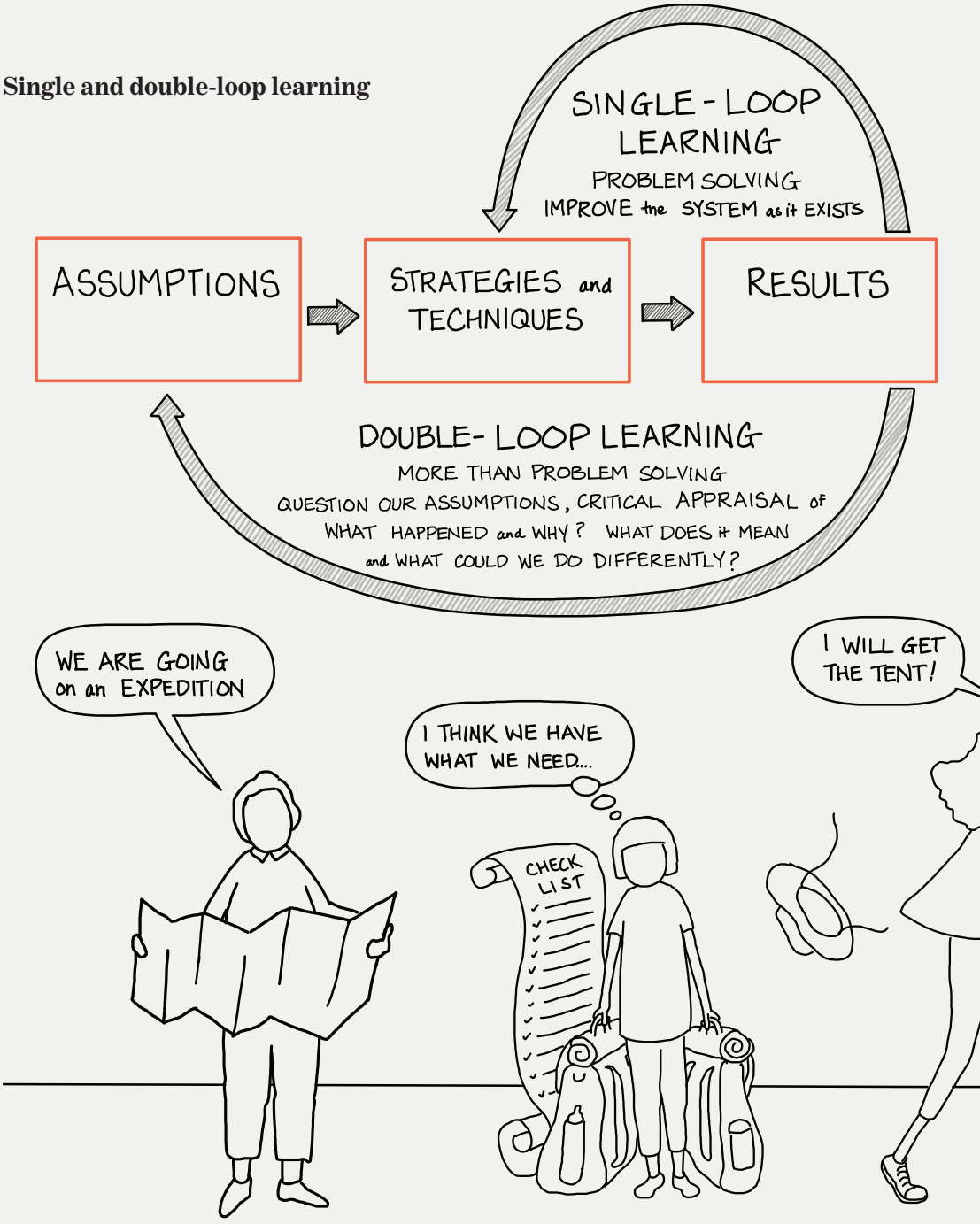
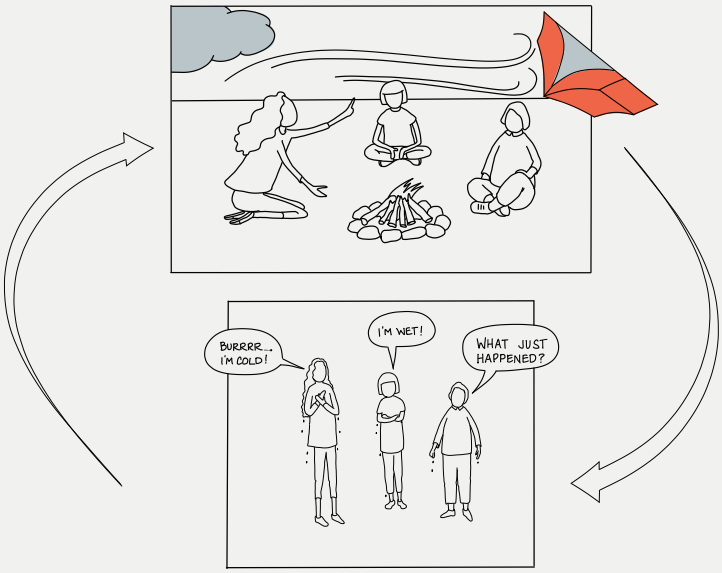
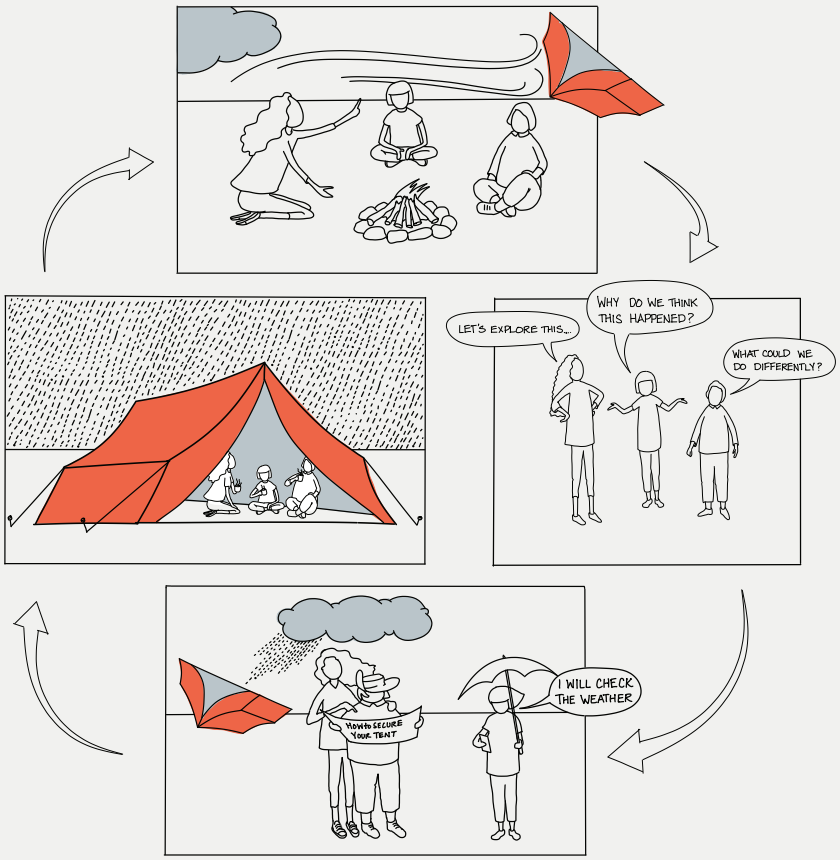


Figure 3: Single and double-loop learning Adapted from Sterman, 2000

SINGLE LOOP LEARNING



DOUBLE LOOP LEARNING



A reminder to stay humble, courageous, and connected

The Systems Journey takes courage. Especially as learning and adapting requires failing (sometimes publicly), which can be hard for many reasons. The fear of failure is deeply rooted in humans. We perceive that failure could risk our sense of belonging or self-worth. And often, the working culture we are embedded in shames or punishes failure.

While the structures we work in will not change quickly, creating your own, small "safe-to-fail" space and network can be instrumental in providing you with the psychological safety to learn, fail, adapt, and iterate. Consciously recognizing fears held around failure is a great way to start, particularly recognizing that fear of failure is shared by all humans. You can then build trusting networks that are diverse and cross power divides. For example, funders can create a safe-to-fail culture within their existing and trusting relationships with grantees, which can pave the way for meaningful and transformational growth. The same goes for a boss and an employee. It helps when those in positions of relative power signal the possibility and openness to failure.

Learning and iterating require the right combination of humility and courage. Humility involves recognizing the humanity of failure and reframing it as an opportunity to learn and grow. Courage enables you to fail publicly, and being connected to a community supports you in your learning, failing, and growth.

These tools are not mutually exclusive and can be used together, or in conjunction with other learning practices (for a useful inventory of tools to support learning, see USAID, 2018). Whichever tool we use to facilitate learning, the core task in any learning process is asking *powerful questions* that provoke deep reflection (see Powerful questions, p. 157), and responding to questions in ways that invite further inquiry (Edmondson, 2019). These powerful questions and responses move us away from simply describing what happened (known as *single-loop learning*), to exploring why something happened (*double-loop learning*, Argyris and Schön, 1978).

Stories from the field

Curbing illegal wild meat trade and the importance of reflecting even on success

To reduce the illegal transportation of bushmeat from Conkouati-Douli National Park and surrounding logging concessions in the southwest of the Republic of Congo, the Wildlife Conservation Society (WCS) and the government protected area's staff decided to erect a barrier along the main road to the large coastal city of Pointe-Noire. For the first few days, the staff confiscated bushmeat from almost every vehicle they stopped at the barrier.

Over the next few weeks, the intervention appeared to be a dramatic success, with almost no bushmeat found in any vehicle stopped at the barrier. The team was elated. Their plan had worked! The barrier and confiscation of contraband appeared to be a strong disincentive for drivers to buy and transport bushmeat to the city.

Using a **Pause and Reflect** session, the team took time to reflect on this "success" instead of reporting it up to higher headquarters and moving on to another project. Their reflection led them to ask whether there could be any other explanation for the outcome they were witnessing.

They decided to dig a bit deeper and in talking to local bushmeat hunters they found out that the barrier was not actually effective in curbing the flow of illegal bushmeat. Drivers had simply discovered that they could stop well before the barrier and unload their bushmeat cargo to porters, who would then transport the goods around the barrier through the forest and reload after the trucks had cleared the inspection at the barrier.

Without reflecting on the apparent success of the barrier, the team may never have realized the perverse outcome of the intervention. As a result, the team shifted their strategy to using pop-up barriers, which were set up on random days at continually changing locations along the road.

For more on this case see Guadagno, et al., 2021.

It is important to set and enforce clear ground rules for **Pause & Reflect** discussions and for forums where decisions are being made about the future of a Systems Journey. These ground rules need to reward the asking of powerful questions or the providing of powerful responses (Edmondson, 2019). They offer a foundation for a conversation in which participants can trust each other with unpopular or controversial opinions, or in which participants can respectfully identify cognitive biases in themselves or others. And never forget about power. Inevitably, power dynamics and systemic legacies will shape how actors show up and participate in these types of sessions. Don't forget to keep checking for red flags and make sure that any space you create for reflection and learning is safe for all participants involved.

Powerful questions

The most powerful tool in our learning toolbox is the ability to ask questions. Questions create opportunities for others to think, reflect, and critically appraise. In her book *The Fearless Organization* (2019), Amy Edmondson synthesizes work by the World Cafe organization to distill the attributes of questions that provoke learning.

Powerful questions:

- Generate curiosity in the listener
- Stimulate reflective conversation
- Are thought-provoking
- Surface underlying assumptions
- Invite creativity and new possibilities
- Generate energy and forward movement
- Channel attention and focus inquiry
- Stay with participants
- Touch deeper meaning
- Evoke further powerful questions

These can be combined into three rules of thumb for asking questions:

1. Always ask questions that you don't know the answer to
2. Ask questions in ways that do not limit response options to "yes" or "no"
3. Phrase questions in ways that help others share focused thinking

Powerful responses that invite others to speak or create an opportunity for further exploration can be just as important as asking questions that provoke learning. These include:

1. I don't know
2. I need help
3. I made a mistake
4. I'm sorry

3. Raise awareness around cognitive biases

The first two steps in Step G: Learn and adapt emphasize how important it is to ensure that opportunities for learning and adaptation are codified into the activities and structures that govern how we work. But this is often easier said than done. It's important to remember that, as humans, we are not always wired to embrace and navigate uncertainty. An individual's capacity for this is shaped by numerous factors, some of which are easy to

address, and others less so. Here we introduce how raising our individual and collective awareness of cognitive biases can equip us to navigate uncertainty and "get out of our own way" so we can learn and adapt our way forward.

Cognitive biases are the mental filters used naturally and often unconsciously to make sense of constant streams of information through simplification and association (Ariely, 2010). They are powerful and can be hard to detect in ourselves and challenge in others.

There are many cognitive biases that can affect how we process information about the Systems Journey, or the decisions we make based on that information (see Table 9 below). These biases may lead us to "play not to lose" rather than "play to win" (status-quo bias), or to fail to recognize when information is challenging our assumptions (confirmation bias). There are several ways to raise our awareness of these cognitive biases in our decision-making, ranging from simple exercises at the start of each learning session to more formal tools (e.g., **Wind Tunneling** and the **Three Horizons Framework,** and see Table 2 in Tanner, et al., 2020b). Most simply, we can remind people prior to major decisions (a) that cognitive biases can undermine our ability to make good decisions, (b) what the different types of cognitive biases are and how they manifest, and (c) that it is possible to call out biases to improve decision-making.

Cognitive biases in decision-making

Category	Bias	Description	Examples
Action-oriented biases	Optimism bias	We tend to overestimate our odds of success and underestimate our chances of failure or of negative events happening to us.	Overestimating the potential social benefits of a new protected area based on positive examples from different contexts.
	Planning fallacy	The tendency to optimistically plan project timescales and resources and to overlook project risks.	Scaling a community engagement initiative without factoring in the time needed for NGO staff to build relationships with new political appointees.

Cognitive biases in decision-making

Category	Bias	Description	Examples
Stability biases	Sunk bias	We are often influenced by the past. *Sunk costs*, which are irretrievable and have no bearing on future outcomes, will continue to distort our decisions.	Continuing to invest in a "flagship program" despite evidence indicating that the program does not achieve desired outcomes
	Status-quo bias	The tendency to stick to a current course of action because it is harder to justify a change of course than the status quo and the fact that it is more effort to change course.	Continuing with pre-agreed stakeholder engagement activities without trying new techniques in sites where participation indicators are low.
Social biases	Group-think	The tendency to be influenced by the opinions and actions of others when operating within a group.	Project managers agreeing with the funding projections for the next phase of work based on the opinion of the most vocal team member in a strategy meeting.
Pattern-matching biases	Confirmation bias	When we want something to be true we will identify the evidence that supports it.	Seeking and referencing only research studies that support our pre-existing beliefs.

Table 9: Cognitive biases in decision-making

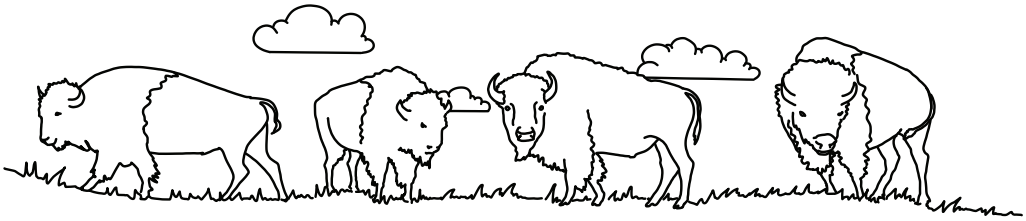
Reproduced with permission from Tanner, et al., 2020 and based on original typology by Lovallo & Sibony, 2010

Moving forward

Learning is only meaningful if it changes us and how we work. Each time we observe the impacts of our actions in the system, or new information comes to light, we need to ask ourselves what it means for how we show up, make decisions, and interact with our colleagues and collaborators. What does it mean for our theories of change and action? Or the data and information we collect? Only by asking these tough questions and acting on what we learn do we really start to create systems change. Asking these questions doesn't imply that we need to throw out everything we've done and start all over again. It just invites us to be honest with ourselves and others and gives us an opportunity to pivot, and do better and more impactful work as the conditions around us evolve and change.

A journey does not take place in isolation: it is anchored in the individuals, organizations, and contexts in which it takes place. In some cases, these anchors will have characteristics, business processes, or social and cultural dynamics that either enhance or limit our capacity to learn and adapt. Learning our way forward may require us to challenge the norms within which we live and work. For example, we may need to negotiate to work with a funder differently (see Experimenting in the real world, p. 150), seek permission to work outside of a set operational structure, or let go of tools, methods, or ways of working that no longer serve us. We may be surprised by the opportunities that can emerge when we find the courage to do this! But it is also important to remember that letting go of the old is not always easy — give yourself and others the permission to mourn the loss of what we leave behind on our journeys, so we can boldly take steps toward creating change.

The majority of journeys will also encounter mindsets, organizational procedures, or cultural dynamics that value certainty over uncertainty and clear and rigid work plans over iterative experimentation toward particular outcomes. There are many diagnostic tools that can support organizations in shifting behavior to encourage adaptive learning (e.g., Harvard Business Review's Learning Organizations Survey, see Garvin, et al., 2008). But a strong enabling environment is not necessary for iterative experimentation to take root in a journey, either. Creating space to ask powerful questions or opening up a discussion based on the honest-but-effective response of "I don't know" can be all that is needed. The act of revisiting our thinking, challenging our assumptions, and changing our actions based on new insights will help us create a journey that is "roughly right."



FAQs

- **What do I do when my team is resistant to the idea of learning and adapting?**
  As fashion designer Coco Chanel said, "Don't spend time beating on a wall, hoping to transform it into a door." It's better to focus on changing what is within your own personal sphere of influence. Learn and adapt yourself and if you can't find it within your own immediate team, find a network of trusted colleagues and partners with whom you can learn and adapt.
- **How do I know when to stop an experiment and scale it up?**
  This is where being intentional about how you choose to sense systems change is critical! When we design an experiment, we know that the decisions we may need to make differ from those for any work that may unfold over a longer period of time. Asking yourself a few questions like these can help:
    - Based on our understanding of the system and its dynamics, in our experiment (likely on a smaller scale from the full system), how long do we need to wait to see the change we want?
    - What signals in the system might help us understand if the change we're seeking is unfolding?
    - Who is helping us sense this change?
- **This sounds tiring! How can I make learning and adapting easier?**
  Oftentimes, overcoming the fear of failure is the hardest part of learning and adapting your way forward. And unfortunately, there are no shortcuts — working on our innate fear of failure requires practice and patience. But also, like any other skill, embedding yourself in an enabling environment with the right teachers and mentors, a supportive community, and showing up with a hopeful attitude will help your practice pay off in the long run!

Tools referenced in this chapter

- **Creative Writing**
- **Pause and Reflect**
- **Wind Tunneling**

Boxes in this chapter

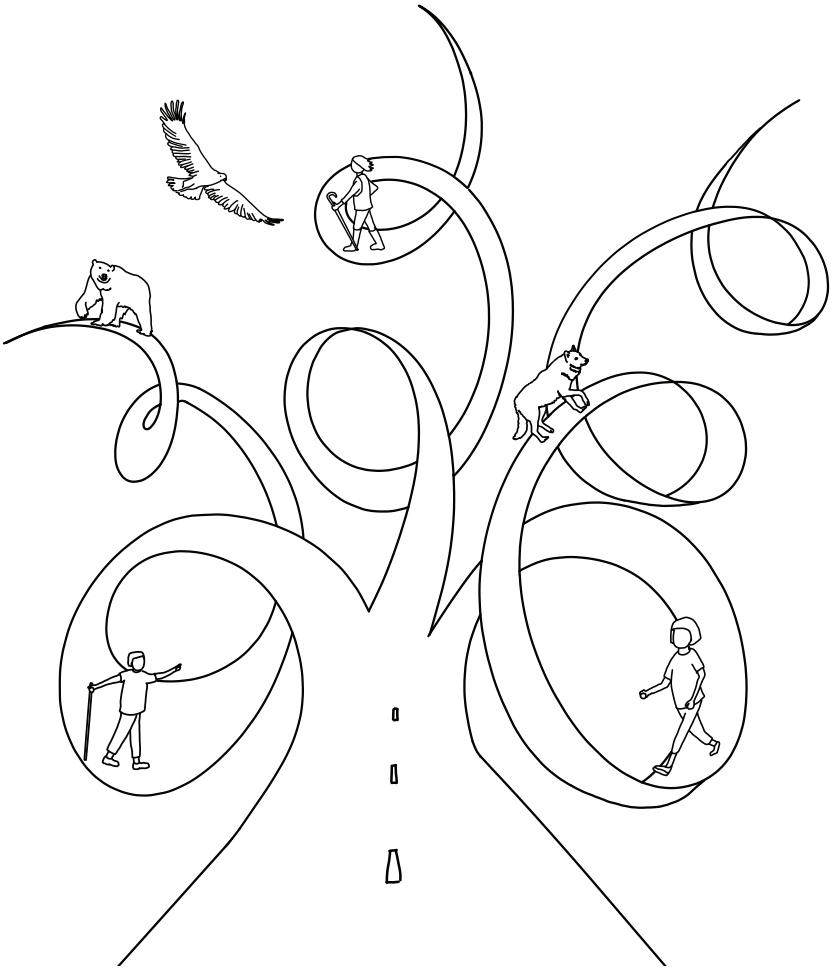
- Tips for real-world experiments
- Experimenting in the real world
- Keep challenging assumptions
- A reminder to stay humble, courageous, and connected
- Curbing illegal wild meat trade, and the importance of reflecting even on success
- Powerful questions

Tables in this chapter

- Table 9: Cognitive biases in decision-making

SUMMARY

THE ROADS AHEAD



It has never been clearer that creating the conditions for people and nature to survive and thrive in an uncertain future requires radical shifts in how we think, work, and act. But we must remember that this change is unlikely to happen overnight. While there will always be unexpected and unpredictable shifts in the systems within which we live and work (and windows of opportunity we can take advantage of!), changing the structures and mental models that govern how we work will take time, patience, and a great deal of creativity and hope.

We believe that by sharing our own personal experiences, tools, and insights into how we have applied systems thinking in our work, you too can find and take your first step. Each individual journey to create systems change will be unique. So here, dear reader, we leave you with some of our favorite pieces of advice, which we turn to time and again on our own journeys.

CHANGING OURSELVES IS THE FIRST STEP IN CHANGING SYSTEMS. Always create time to pause, reflect, and challenge your assumptions about how the world works, and how change happens. Hold space for letting go of what no longer serves you, and risk being changed by what you learn and hear!

LISTEN DEEPLY. Cultivating your capacity to listen deeply can help you realize the full potential of the tools, processes, and concepts introduced in this guide. Skills like these take time to cultivate. Keep searching for opportunities to deepen these capacities through both individual practices and together with your core team.

TWO STEPS FORWARD, ONE STEP BACK. A Systems Journey rarely follows a set of carefully planned steps and phases. While this guide introduces some common phases and steps, almost any moment can become an opportunity to create systems change. Even if you don't find yourself with the chance to start from Phase 1, you can still begin by taking the first step wherever you find the will and opportunity.

NEVER IGNORE POWER. In nearly every situation we find ourselves in, power shapes how we see, think, and act. This is especially the case when we work across different countries and cultures, each with its own complex history steeped in power and politics. Power also changes depending on context: you may lack power in one setting only to move to a different context where you have power. Listening deeply and training yourself to look below the surface can attune you to power dynamics over time. The better you can sense power, the more you will be able to use the power you have wisely — to elevate others who may have less power or to stand up to those who abuse their power.

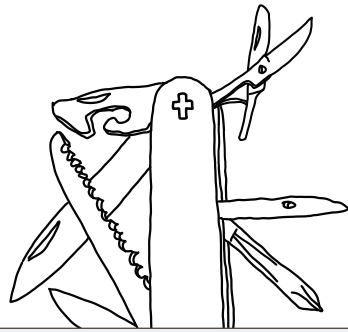
EMBRACE TENSIONS. Throughout the journey, we encountered areas of convergence and divergence. While it's tempting (and often easier) to focus on the areas where there is agreement, remember to hold space for and navigate areas of divergence and tension. Our world is full of contradictions and polarities, and it is often within these areas of tension that the greatest opportunities for transformative change emerge.

ASK GOOD (AND DYNAMIC!) QUESTIONS. Part of understanding and navigating complex systems involves seeing the world through the lens of system dynamics: identifying and working with features like feedback loops, time delays, and thresholds. Learning how to *speak in systems* and ask good questions about the dynamics of the world around you is worth the time, as it can help you and others unlock new insights for creating change.

THINK COMPASS, NOT MAP. Embarking on a journey means embracing uncertainty. This changes how we interact with the ideas, plans, and products we create and use in our day-to-day work. It helps to think of the artifacts we produce on a journey as compasses, rather than maps, as they guide how we work and journey with others in our increasingly uncertain world.

AND FINALLY, REMEMBER IT'S A JOURNEY. Cultivating the art and craft of systems change will not happen all at once. Embrace the missteps, the uncertainties, and the process, and find time to savor and enjoy it all as you learn your way forward!

PRACTICAL TOOLS FOR A COMPLEX WORLD



"IF A CRAFTSMAN WANTS TO DO GOOD WORK, [THEY] MUST FIRST SHARPEN THEIR TOOLS."

—CONFUCIUS

In this guide, we consider *tools* to be any method or approach that can help you and others work through phases or steps on a Systems Journey. Tools can be used by individuals or groups, and are designed to help prompt ah-ha moments or uncover insights about the world in which we live and strive to change. They can also help you step back and reflect on where you are in a given moment on your journey, lay out and clarify leverage points, or test and iterate on actions for creating change.

There are many tools that you could use to support your Systems Journey. We decided to include 11 of our favorite tools here given their ease of use, relevance for different phases in a Systems Journey, capacities to uncover new insights rapidly, abilities to be applied in different contexts and settings (individual, group, virtual, in-person), and modular natures whereby they can be used in different configurations together.

11 Tools for Systems Change

	Tool	What is it for?
1	**Creative Writing** (p. 171)	Encourages reflection on individual values, beliefs, and ambitions.
2	**Historical Timeline** (p. 175)	Facilitates discussion on the past, present, and future to better understand trajectories of change. Helps keep the dimension of time at the forefront of discussions and prompts thinking about the "how long" and "when" of problem origins, system behaviors, or possible lags in change and outcomes.
3	**Semi-structured Interviews** (p. 179)	Elevate different voices or perspectives in a system and facilitate the development of one-to-one relationships between stakeholders. Related to *learning journeys* or used in *paired walk-and-talks*.
4	**The Iceberg Model** (p. 185)	Prompts discussion on a system's events, patterns, structures, and underlying mental models, challenging personal biases and accelerating information-gathering around the root problems within systems.
5	**Systems Mapping** (p. 189)	Uncovers relationships in a system and encourages reflection on causal relationships between compo-nents of systems.

	Tool	What is it for?
6	**Visualizing Situations and Change** (p. 193)	Uses visual arts to uncover different perspectives in a system and facilitates engagement between stakeholders without language. Can use different mediums including drawing (Rich Picture) and photography (Photovoice)
7	**Stakeholder Mapping** (p. 201)	Uncovers relationships and power dynamics between actors in a system.
8	**Rapid Cycle Prototyping** (p. 209)	Encourages rapid and collaborative iteration on ideas for creating change.
9	**Scenario Planning** (p. 215)	Identifies possible futures for a system given what we know about the past, trajectories of change, and different perspectives on a system. Used mostly during **Phase 2: Explore**.
10	**Wind Tunneling** (p. 219)	Used to stress test ideas for actions or interventions against possible futures, to assess suitability for different contexts and systems. Used mostly during **Phase 2: Explore** and **Phase 3: Learning Our Way Forward**.
11	**Pause and Reflect** (p. 225)	Invites reflection on how and why change has happened, drawing on different types of evidence or knowledge.

Many of the tools described here are flexible: they can be dialed up or down depending on the amount of time you have and the complexity of the system you're working in. Some have several forms, which can allow you to adapt the tool to different situations, questions, and needs. While many of these tools can be considered beginner-level, they are also tools that we and other systems-change facilitators turn to time and again in our work. For each tool, we introduce the estimated time and experience required, an overview of its purpose and intent, basic instructions, and a story describing the tool in action, some of which you may have already read in Part 1.

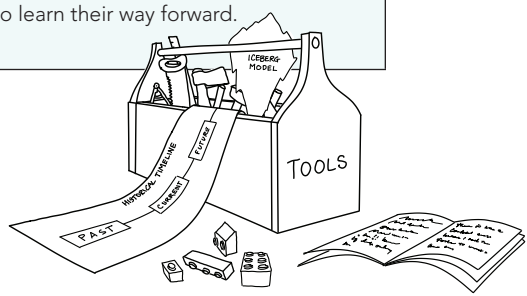
It's rare to use only one tool on a Systems Journey. Tools often complement one another or can be used in different ways at different times in different combinations. Different tools can help us describe, explore, capture, share, interrogate, and experiment around ways of thinking and working that enable us to change the people and places around us. Using various tools together helps us probe a system in a variety of ways to uncover new insights and perspectives. It's fine if some of the tools here are new to you. Learning new tools is about going on our own journeys of changed experience and skill. These tools might complement some you already have in your go-to toolkit, or they might replace those that are no longer fit-for-purpose. As Dr. Edith Eger said, change is about "interrupting the habits and patterns that no longer serve us." Tools also offer us practical ways to begin to change our own habits and patterns of thinking, how we relate to each other and the world, and how we gather and explore knowledge to inform the actions we take.

Bringing tools together

No one Systems Journey is the same and to successfully learn our way forward, we often end up using tools in different ways and combinations depending on the conditions we face. Take this example:

An international NGO interested in developing a new initiative to reduce this risk of zoonotic-disease spillover wanted to develop a deeper understanding of the systems they were working in. Their journey began with a virtual, multi-week workshop to understand the issue and identify an initial set of actions to implement under a global strategy. A core facilitation team made up of NGO staff and external facilitators designed the process. They spent two weeks orienting themselves to the journey, identifying which systems tools would be most appropriate for their context, and designing the two-week, virtual workshop. The team identified a number of participants, who represented different areas of expertise to take part.

See Entry point: Crash Course (p. 25) for details on how the team used a variety of these practical tools (including **Semi-structured Interviews**, **Systems Mapping**, **Scenario Planning**, and **Rapid Cycle Prototyping**) in combination to identify possible actions and create a set of artifacts that served as a strong foundation for the team to learn their way forward.

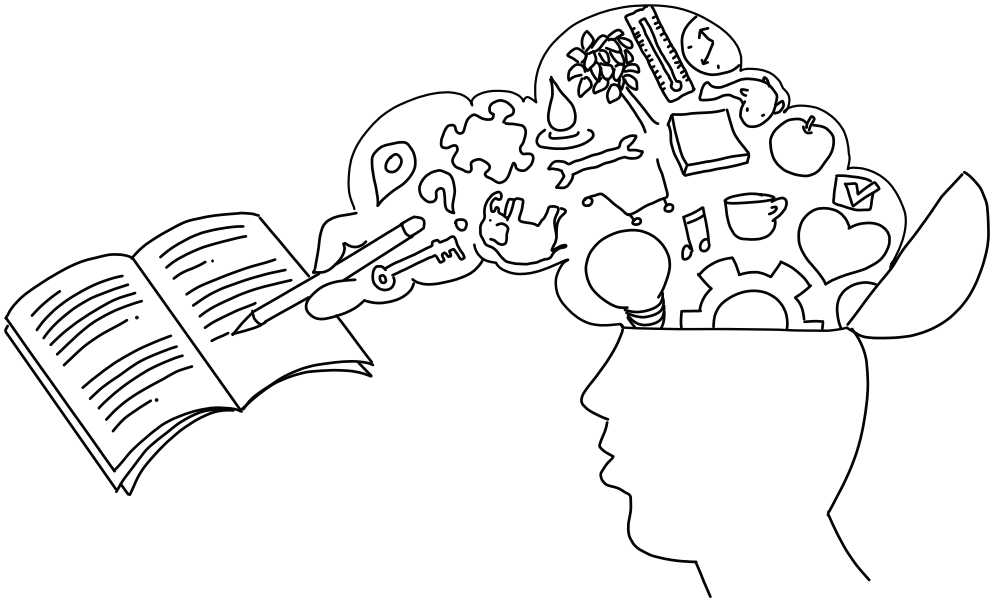


1. CREATIVE WRITING

Level of effort: Low
Time required: 30 minutes to 1 hour
Skills required: Writing and basic facilitation

Writing is a powerful tool. By noticing, reflecting on, and writing about our deepest thoughts, ideas, hopes, and concerns, we can develop a clearer emotional grasp on our own intentions as well as the problem we're trying to solve. Writing can help navigators and participants in a Systems Journey to slow down and articulate how a system or problem is currently understood. Writing regularly can prompt reflection on how this understanding changes over time to help us engage more purposefully with those around us.

With this tool, we introduce the ways that **Creative Writing** can be used to facilitate individual and group reflection on creating change in the world. We introduce how you might use creative writing with two approaches: (1) journaling and (2) letter writing.



Before getting started

Think about whether writing is an appropriate tool for your situation. Be conscious of your group's literacy levels and in a multilingual context, encourage participants to write in the language that is most comfortable for them.

Make sure that you have the right materials for creative writing: paper, pens, pencils, notebooks, or phones, tablets, or computers. If you are working in a virtual setting, remind remote participants about the materials they need to bring. You can encourage a screen break by suggesting participants write on paper, or use a digital document if easier.

Instructions

Approach 1: Journaling

Writing in a journal is a tried and tested practice that surfaces your deeper thoughts and ideas. Journaling is writing down whatever flows out — recording what comes immediately to mind, rather than ideas previously thought through. It is as much an opportunity to self-reflect as it is to discover what's been learned over the course of an event, module, or project. Journaling can be used as an individual tool or to encourage a team or group to reflect on a given topic or question over a longer period of time.

1. **Define intent and develop structure.** The first step in journaling is to define your intent and develop a rough structure to guide the exercise. If you want to use this tool individually, you can be looser with your structure. With a group, set expectations so that everyone knows the purpose of the exercise. For example, a purpose may be to document individual and collective thoughts, hopes, and concerns at the beginning of a new initiative. Or, to guide the earliest days of stakeholder engagement, to observe how relationships with collaborators grow. Be clear on your intent and define a time period that fits.
2. **Use and/or share guidance.** Journaling is a very personal exercise and often does not require much guidance. Encourage participants to just start writing. The goal of journaling is a stream of consciousness, so there's no "right" way. While your process might involve sharing portions of a journal, this should generally be a private exercise. Prompts can be as simple as encouraging participants to reflect on how they are feeling at different points on the journey — writing down concerns, insights, doubts, fears, and questions about the journey. Some questions to guide journaling include:

    a. What is becoming clearer to you?

    b. What are you feeling?

    c. What is confusing?

d. What questions are you holding onto?

e. What is surprising you?

f. What is challenging you?

3. **Reflect.** If journaling was designed to be an individual exercise, take the time to review your entries from time to time, especially at pivot points in your project such as during renewal processes or before meeting with new collaborators or system actors. If you're using **Pause and Reflect,** journal entries can be valuable contributions, either for individuals to reflect upon, or to share with others.

Approach 2: Letter Writing

Writing a letter to someone else —even if you never send it — can be a powerful way to uncover feelings and thoughts you may have difficulty admitting to at first. Writing a letter to yourself — a younger or future self — can help you play with time and reframe a current experience with whatever problem you're trying to solve.

1. **Define intent and develop a prompt.** As with journaling, defining what you want to achieve in letter writing is a key first step. Is the intent individual or relational: do you or participants need to connect with self (letter to younger or future self) or with others (letter to an adversary or a friend)?
2. **Write letters.** Ensure that you (and/or participants) are in comfortable spaces and are encouraged to think creatively. Letter writing can be done almost anywhere: outside, at home, even by a river, or in a forest. Make the letter-writing experience as real as you can by including addresses (email or physical), dates, and placing it in an envelope or appropriate document template. The more real the letter feels, the more real the impact of exercise.
3. **Reflect on or share letters.** Encourage participants to use their letters as they'd like: For example, keeping them by their desk to remind them of what they reflected on. For group exercises, letters could be shared, either by reading quietly or out loud. Be mindful of the group's dynamics and history before sharing anything publicly.

Letter-writing for orientation

During a mid-point review of an organizational strategy, a team was attempting to integrate new team members while simultaneously evaluating the kinds of activities that were currently underway. Bringing on new team members in the middle of a medium-term strategy process raises a number of challenges, including getting people up-to-speed on organizational history, encouraging buy-in of pre-developed strategies and activities, and allowing new team members to bring fresh perspectives and energy while not delaying continued delivery needs.

In order to sense how people were seeing themselves, the organization, and their contribution to it, the team used a neutral facilitator to guide conversations. One method employed was writing a letter from your future self. Each member was asked to write together in silence, over a virtual platform, a short letter from their future self in 2030. The letter was to look back on the achievements and impacts of the team and work, as well as what they valued most.

Using this kind of creative medium encourages people to step out of an operational mindset and to think about the bigger picture. In each letter, people highlighted different values, activities, and ways they created change, as well as reflected on their own contributions.

After the letters were read out loud, a conversation was facilitated to see how people related their "future self" to what was happening currently in the organization. Sharing the letters fostered empathy and understanding across the team while allowing new team members to share the same level of input (a fictional "future self") and arrive at the same place as long-serving team members. The team was able to examine activities, strengthen their dynamics, and allow space to celebrate and encourage optimism.

2. HISTORICAL TIMELINE

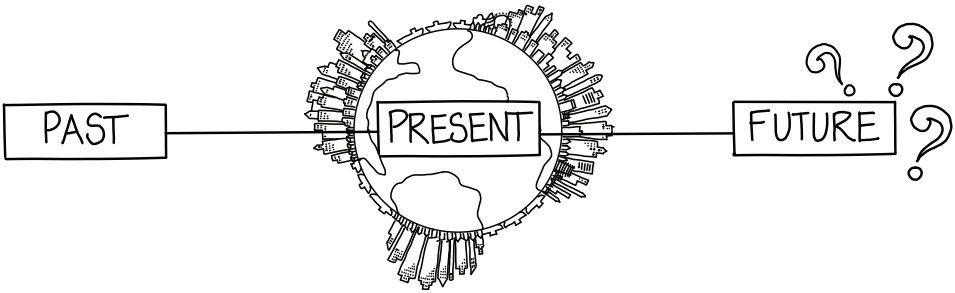
Level of effort: Low
Time required: 30 minutes to 2 hours
Skills required: Basic facilitation

All systems have a past, present, and future. All systems change with time, sometimes slowly, sometimes quickly, and sometimes unexpectedly[1]. As a result, time has to be a fundamental guiding concept for those on a Systems Journey. The **Historical Timeline**[2] tool (and others, like the **Three Horizon Framework** and **Scenario Planning**) help us explore how time shapes the systems in which we live and work today.

The main purpose of creating a Historical Timeline is to explore how past events and dynamics have contributed to the systems we see today. With a solid understanding of a system's history, we can understand current dilemmas and how they emerged. The timeline can also shed light on capacities in the system by looking at how people responded to and dealt with crises in the past, and the various capacities available then and now. Timelines are useful at many stages in a Systems Journey and encourage people to reflect on why things have happened, which can inform more critical thought on what actions to take today to shape the future.

---

1 Principle 4, The Art of Systems Change, p.57
2 Tool adapted from Wayfinder.earth with permission



Before getting started

It's important to be aware of any cultural sensitivity around historical events, particularly for colonized, marginalized, or displaced peoples. You may want to avoid using the timeline tool early in a journey before you have understood those cultural sensitivities or traumas that have been experienced, and worked to cultivate trusting and reflective relationships between actors on your journey.

Instructions

1. **Identify events.** There are a few ways to create a timeline. Either start with individuals jotting down 4–5 key events that, from their perspective, have shaped the system and add these to the timeline. This usually leads to a lot of discussion about the sequence of events and when something really happened. Alternatively, you can work through this as a group discussion, noting key events and filling in gaps and details as the group knowledge builds.
2. **If needed, organize!** Depending on the flow of conversation, you may choose to separate out the different types of events into categories — for example, social, political, economic, and environmental — onto parallel lines and then draw lines between them. You could also separate different scales of the system and link the events across them.
3. **Explore.** Having created a timeline, take a step back and reflect on what has happened through a "systems" lens. Review past events to identify (1) periods of stability or rapid change, (2) patterns of change (long-wave cycles like droughts or repeated events like annual labor migrations, and (3) events in history that link past and current dynamics (for example, historical settlement schemes resulting in current land degradation).

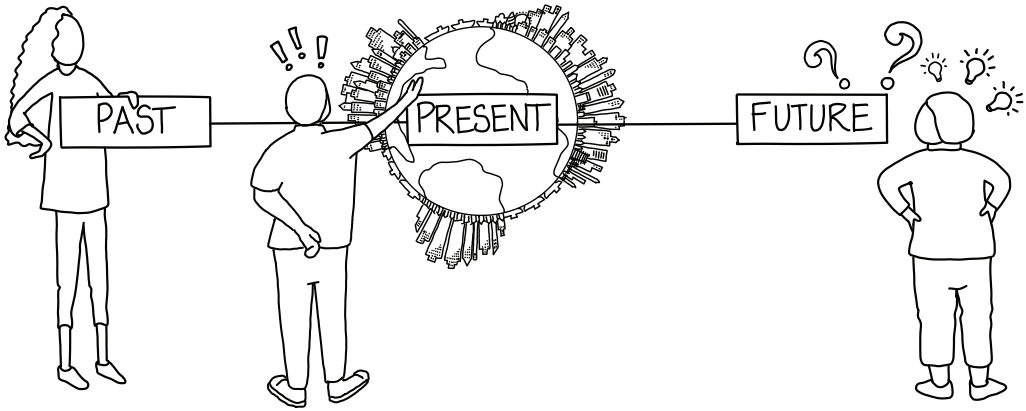
To facilitate the discussion, use probing questions:

- How has the system, including its benefits and dilemmas, changed over time? Are there significant historical legacies? For example, are there singular events (like a new policy) or cumulative changes (like out-migration of people) that have significantly shaped or influenced the current system and the benefits it generates?

- What kinds of shocks and stresses have been experienced in this system (e.g., recurring droughts, low rainfall)? Are there any patterns to this (e.g., cyclic patterns of droughts)? If so, are the patterns showing signs of change (e.g., increased frequency or magnitude of droughts)?
- Historically, how did people in the system respond to the changes with which they were faced? Can you identify different eras in this respect? Which of these strategies might still be useful today, considering the new types of drivers for change and challenges that arise?

Tips for facilitators

The temptation is strong to use the past to help predict the future, so be mindful as you're facilitating the conversation and avoid using the timeline to forecast forward or develop scenarios. The timeline instead can help you reflect on uncertainty, surprise, and unexpected events, as the future will most certainly not be like the past.



Three timelines

A conservation organization was asked by its board of directors to develop a new five-year strategy. On the first day of the strategy process, the facilitator spent two hours on a Historical Timeline exercise. Participants (which included most of the NGO's staff members) were invited to add events to three different timelines that were drawn on paper mounted on a wall. One timeline focused on "the individual" and participants could add their personal milestones. Just above it, the second timeline focused on the organization. And finally, on top, the third timeline depicted the national context in which the organization worked. The three timelines were all posted on the wall with dates parallel to one another, and participants were invited to add entries to all three levels using sticky notes. Creating the timeline took approximately 30 minutes. Participants were then invited to review the timeline individually, followed by discussions in small groups and a subsequent debrief with all the workshop participants.

The timeline exercises prompted deep discussions in the early hours of the strategy process. On all three levels, different events proved to be important for different people across the organization, which invoked discussions on how the different linguistic and cultural backgrounds of staff led them to see the world in very different ways despite being part of the same organization. Including individual events and memories on the timeline helped make the exercise much more personal for participants and prompted discussion on how different events linked to one another across the timelines. These three stages of reflection (individual, small-group, and organization-wide) helped participants process and internalize the massive amounts of information that were generated by the exercise, fostering more empathy between participants. The three timelines helped individuals see beyond their own perspectives and link their own experiences to the organization's history and the nation's change (as an important shaper of the context of the organization's work).

Starting the organization's strategy-review process with a timeline exercise placed the concept of time front and center in the strategy. Having the timeline artifact on the wall during the meeting also helped the group make a clearer distinction between what had been done and worked in the past compared to what needed to be brought forward or done differently in the future. And finally, weaving together the three layers reinforced the importance of seeing the system more holistically and recognizing that the complexities of human systems were just as critical to keep in mind as they developed strategies for protecting the environment.

3. SEMI-STRUCTURED INTERVIEWS

Level of effort: Low
Time required: 30 minutes to 2 hours
Skills required: Basic facilitation

A **Semi-structured Interview** is a type of interview that encourages dialogue between two or more people around a set of questions. Semi-structured Interviews are simple, powerful, and flexible and can be used at almost any point in a Systems Journey. They can elevate diverse perspectives by creating dedicated time and space for active listening and learning, and can also facilitate relationship-building between stakeholders in a system. The personal connection created through one-on-one or small-group interviews provides both space and time for interviewers and interviewees to connect more intimately and build trust. The interview structure also grants flexibility to use the set of questions loosely and probe deeper into specific areas of interest depending on the direction of the conversation. Semi-structured Interviews are also commonly used as a qualitative research method.

Semi-structured Interviews can be conducted in different ways, with a variety of facilitation tools and methods that build on a standard interview structure. They can be carried out informally on a walk (*paired walk-and-talk*), or on a visit to an interviewee's home, place of work, or area of interest (*learning journey*).

Semi-structured Interviews can serve different purposes during different phases of a journey. For example, in **Phase 1: Engage**, interviews might help you and your core team better understand your personal roles in a Systems Journey, or learn from others about the history of a system. In **Phase 2: Explore**, a Semi-structured Interview could help you understand how different stakeholders think about the future, which actions they find most critical, and why. And in **Phase 3: Learning Our Way Forward,** Semi-structured Interviews can help uncover narratives about how change happened to support learning and adaptation.

Instructions

1. **Define intent.** Defining your personal intent for using this tool shapes how you design and prepare for the interview. Reflect on what phase of the journey you are in, who you want to engage with, and why. Use your intent first to confirm that this tool is the right fit, and if so, then to guide the remaining steps in this process.
2. **Conduct background research.** Based on your intent, identify who to interview and what you want to learn during the interview process. To prepare, do background research on potential interviewees to learn more

about them, their interests, why they are important to interview, and how you might connect with them on a personal level during the interview. Background research can be as simple as asking friends and colleagues about these individuals or researching online.

3. **Decide on format and location.** Where and how interviews are conducted will be based on your constraints, resources, and intent. Interviews can be carried out face-to-face in traditional settings (meeting rooms, coffee shops) or virtually. Consider how the setting of the interview will influence the dialogue you will have and the outcomes of the interview. If building a personal relationship is important, you may want to consider more interactive formats for your interview, such as a *learning journey* or *walk-and-talk* (introduced above).
4. **Develop questions.** With a little information about your interviewee(s), you can develop questions to ask during your interview. If carrying out interviews with multiple stakeholders, you may have a uniform set of questions that you ask all interviewees, or you may need to tailor questions to different interviews — this will depend on your intent. Let the questions serve as a loose guide: on a Systems Journey, the process of interviewing and building rapport with an interviewee is as important as the information you learn. Feel free to let the dialogue take a natural course but also include questions that probe deep and rooted aspects of the system.
5. **Prepare for the interview.** Allocate at least 30 minutes immediately before each interview for preparation. Start by preparing yourself mentally: take time to become deeply centered, relaxed, and open to embracing whatever emerges. Take a few breaths and use this time to reconnect with your intention: why are you doing these interviews? Reflect on the personal connection you will make with the interview: is there anything you need to do to create a safe and comfortable space for the interviewee? If there are other people interviewing with you, clarify each person's roles and responsibilities.

Barriers to listening

There are many factors — individual and cultural — that can prevent us from being fully present and listening deeply during an interview. Keep a close eye on these common barriers to listening:

- **Judgment**: By jumping to conclusions about a speaker, you are not giving them your full attention. Allow the speaker to finish what they are saying, keep an open mind, and clarify anything that is needed.

- **Triggers**: As individuals, we all have different situations that can "trigger" emotional reactions. Being attuned to and managing your own emotional triggers is crucial for effective communication. When your emotional response eclipses your attention to the speaker, you will no longer be effectively listening. Take time to recognize any of your triggers and where they may stem from to manage your reactions.

- **Downloading**: By only saying what is expected as "well-mannered," a conversation will not be as successful in uncovering the intricacies of a system. We need to reflect, empathize, and actively make an effort to reach a shared understanding (see Four ways of talking and listening, p. 70).

- **Daydreaming**: Daydreaming can seem relaxing at times, but while daydreaming you are not truly listening to what the speaker is saying. This will impede gaining a deeper awareness of the topic. Actively listen (through reflective dialogue[3]) and ground yourself in the present.

- **Too deep for me:** Sometimes, an interviewee might raise a topic or thread of conversation that is out of your comfort zone or area of knowledge. Even when a topic seems too complex, it is important to put effort into following what the speaker is saying. It may help to ask questions or for clarifications to keep pace with the speaker.

- **Don't rock the boat:** Although you may not want to cause conflict between yourself and an interviewee, it is important to have an authentic conversation. This might require probing about things that may feel uncomfortable, such as values. Always be sensitive here — we don't want to push someone away — but dig deep enough that you start to instill change in each conversation you have.

6. **Conduct the interview.** How you conduct the interview will depend very much on your intent. If your goals are more about relationship-building or information-gathering, you'll need to tailor your facilitation accordingly. Remember the questions you develop will serve as a guide — feel free to let the dialogue take its natural course. If appropriate, probe about deeper aspects of the system. As you end the interview, consider your next steps: do you want to leave the door open for further connection, questions, or collaboration? Your tone, language, and facilitation strategy can help your intent (for example, use pauses and silence wisely and intentionally). Before you close, clearly convey if and how you will follow up with the interviewee afterward.
7. **Debrief.** Immediately afterward, set aside time (whether with fellow interviewers or by yourself if you conducted the interview alone) to reflect. It can be good to spend almost the same amount of time in reflection as you did with your interviewee, as this is when you internalize the perspectives shared during the interview. Ask what was distinctive about the conversation, what substantive points were made, why the interviewee sees the system in the way they do, and what their source of commitment is. Write down your impressions.

Virtual transcriptions

When conducting a virtual interview, some web conferencing platforms (like Zoom) generate free audio transcriptions from recorded calls. Always obtain consent from your interviewee and ensure that the subject matter you are discussing is not highly sensitive before taking advantage of this digital feature. Raw notes automatically generated from the interview mean less work for you and allow you the space for active listening instead of note-taking. These transcripts can also serve as artifacts later in your journey when you want to remember the details of what your expert shared.

Tips for interviewers

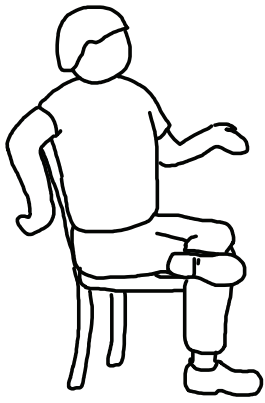
- Suspend judgment and mental models. You want to create a safe and comfortable space for the interviewee and be "in service" to them.
- Practice inquiry — don't offer your own point of view or assessment. Instead, invite examples from the interviewee's experiences using phrases like, "Tell me a story about that." Don't be afraid to ask simple, naive, or "stupid" questions, either. Any question can help the interviewee express and clarify their thinking.

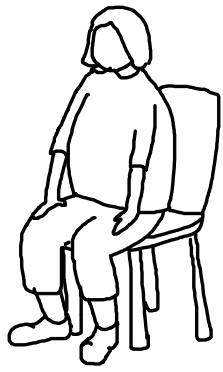
- Connect heart-to-heart with the interviewee on an emotional, human level. Trying to put yourself in the interviewee's shoes can help achieve this.
- Actively listen. Pay attention to any surprises and disconfirming data, notice when public or private "voices" are used, and look for patterns and underlying causes. It is also important to allow for silence — do not jump in to fill the gaps of conversation.
- Go with the flow. Keeping the conversation organic promotes the connection between you and the interviewee and makes for a more rewarding experience.

Tips for interviewees

You may find yourself in the interviewee's seat at some point, or you can share these tips ahead of time with those you are interviewing.

- Be yourself. The interviewer is likely just as curious about you and your work as you are about them. Authenticity is key authenticity is key in a situation like this.
- Show up and be fully present. Remaining committed to these discussions can help you connect to your own purpose with the theme.
- Tell the truth and say no if you need to. You are never obligated to speak about something you feel uncomfortable with sharing. As much as the interviewer wants to step into your world and learn about your frames for thinking about the issue, you are allowed to draw boundaries for what you do and do not want to tell.
- Relax and enjoy! This is a time to give your input and add your details to the big picture. It is not meant to be stressful, but simply a time to share your story.





Understanding the system with Semi-structured Interviews

An NGO was interested in understanding how food waste could be reduced in large supply chains to inform a new strategy on global food waste. The NGO convened a range of stakeholders for a virtual workshop. To help understand the system, participants used Semi-structured Interviews to gain insights from external experts on which opportunities they saw as being critical for reducing food waste.

Experts were identified for interviews through the informal social and professional networks of the workshop participants and were chosen to represent different parts of the supply chain, which included, for example, farmers, wholesalers, representatives from logistics companies, and retailers. Workshop participants developed and followed the same set of 12 questions to guide each interview. Each interview was conducted via Zoom, with a small group of interviewers (2–3) asking questions of a single expert. Since each expert had a different perspective of the supply chains, the questions served as a loose guide to inform a more informal conversation, allowing the conversations to flow naturally to the interviewee's area of expertise.

A common theme on the current importance of "buffers" in the supply chain emerged across the interviews. Experts all shared in their own way how important it was to ensure they had more food than required at different points in the supply chain to secure either future contracts with wholesalers or suppliers, or to meet consumer and customer demand. In a number of places, these "buffers" commonly led to significant food waste in the supply chain.

While the original intent of the exercise was to better understand the system, the process of conducting Semi-structured Interviews also helped to uncover a potential leverage point that the group explored later in the strategy-development process. In this case, integrating multiple perspectives on the same problem led to the emergence of a new insight that helped both the workshop participants and expert interviewees continue to learn their way forward.

4. THE ICEBERG MODEL

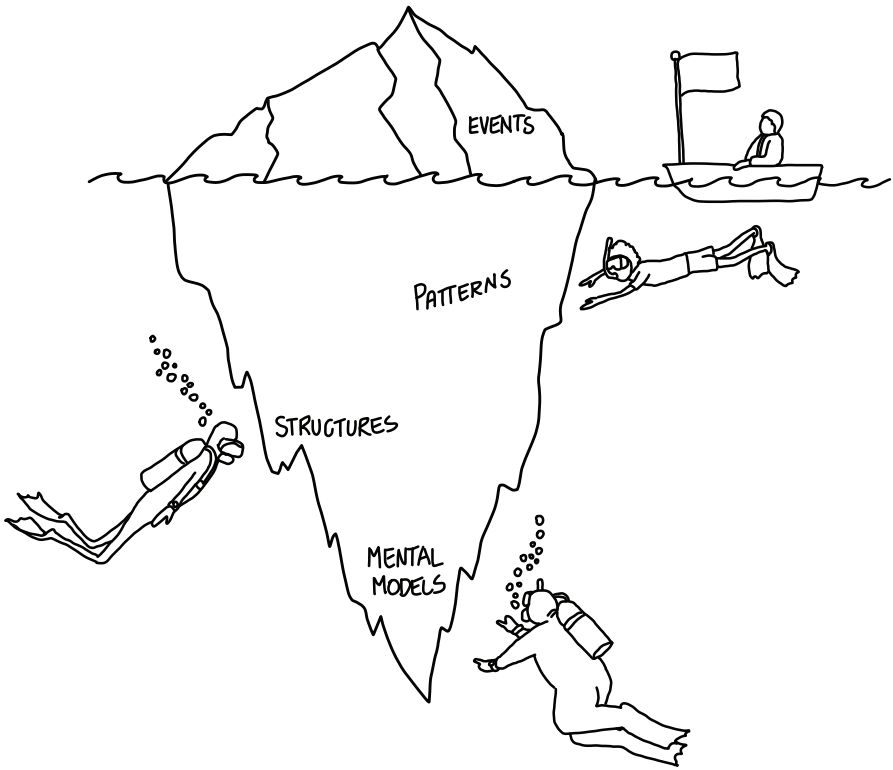
Level of effort: Low
Time required: 30 minutes to 2 hours
Skills required: Basic facilitation

To explore what makes any one component of a system complex, and how it contributes to the overall complexity of the wider system, we must look below the surface. Many times, the events or actions we see are the results of underlying structures, relationships, and beliefs. For this reason, a common metaphor used to understand complex systems is the **Iceberg Model** (Goodman, 2002).

Events are the easiest to see, as they sit right at the surface. We can ask and answer the questions:

"What just happened? What is our current problem?"

- A mine is polluting a local river.
- I've been eating a lot of ice cream.



Just under the surface are the trends and patterns of those events through time. For these, we ask:

"Which patterns have been happening over time?"

- An increasing number of mines have been opened along the river.
- I've started eating more ice cream since I've been biking to work.

These patterns show the structures and relationships that lead to those trends.

"What forces or structures are in place that created these behaviors?"

- Tax rates on extractive businesses have steadily declined for the last four years, creating an incentive for mining.
- In addition, the newest method of mineral extraction relies on large quantities of water for cooling equipment, making mining close to rivers a good business decision.
- When I bike to work, I bike past my favorite ice cream parlor.

Finally, at the base of the iceberg are the underlying mental models, beliefs, and cultures around how the system works:

- Economic development is the most important consideration for a country.
- Mining is the best option for this land.
- Mining companies can't be responsible for accidents.
- Because I've exercised by biking to work, surely I deserve a little treat.

The Iceberg Model helps us uncover differences in the ways people perceive problems and their underlying causes. The further down we work into the iceberg, the closer we get to understanding the roots of problems.

The Iceberg Model can be used as a short, participatory exercise to identify what causes an event and to see how deeper factors, including our own personal mental models, shape how we understand the world.

Before getting started

There are two important considerations as you begin:

- **Have a clear problem statement.** A clear problem statement will guide this exercise. It does not have to be a perfect statement nor be used throughout your initiative, but it should be a good place to start that can guide you to go deeper. A good problem statement from the mining example above might be: *Pollution from mining is degrading water quality.*

- **Participants understand the problem**. In order for the Iceberg Model to be useful, participants must have a deep understanding of the problem and the context in which it occurs. Ensure you have diverse perspectives, especially of those who include less power in the system.

Instructions

1. Write the categories *Events, Patterns, Structures,* and *Mental Models* on a large piece of paper, with *Events* at the top and *Mental Models* at the bottom. You can draw the "iceberg" as a visual metaphor, or use another culturally or geographically appropriate metaphor, such as an island or a tree.
2. Describe each of these categories as shown below.

    a. An **Event** is a discrete action. It can show up as a newspaper headline. Events answer the question: *What happened?*

    b. **Patterns**. Patterns are essentially trends — Events that repeat over time. Patterns answer the questions: What's been happening or What's changing?

    c. **Structures**. Structures are rules, norms, policies, guidelines, power structures, and resource distributions that influence behaviors. They answer the question: *What might explain these behaviors?*

    d. **Mental models.** Mental models are the ideas, dogmas, and worldviews that support a system's structure. These are deeply held assumptions and beliefs that drive behavior.

3. Ask group members to write ideas for items related to your problem that fit into each category on post-it notes. After giving everyone time to think on their own, ask participants to add their post-its to the iceberg visual.

Tips for facilitators

- If participants get stuck, you can move away from the iceberg metaphor and simply pose the question, "Why?" Sometimes referred to as the "**5 Whys**" – just asking why over and over again can probe participants about underlying system structures and mental models. You can then transfer these insights to the Iceberg Model, or ask participants directly how these answers relate to the layers in the iceberg.
- Encourage participants to think about what is happening under the surface. The more we understand and make explicit the deeper structures and mental models, the higher our chances for creating change.

Just ask "why"

The Iceberg Model was used as one of many tools during a three-day workshop where conservation NGOs convened 100+ stakeholders for a dialogue on community-based natural resource management. The Iceberg Model was used to deepen the conversation around the problems that fishers in coastal communities face, and how these problems link to the risks facing coral reefs. The workshop was facilitated and led in a mix of languages and attendees had mixed literacy. Because of this, it was important to have live, simultaneous translation, and a clear focus for the discussion.

Instead of the iceberg, a coral-reef island was used as the metaphor to describe the tool, and notes were taken (in English) on the flipchart by the facilitator. A co-facilitator led the discussion in the local language, probing to facilitate a more natural, flowing conversation. In this case, less of an emphasis was placed on using the iceberg categories, and the facilitator relied more on asking "Why?"

In this example, the Iceberg Model was combined with another common facilitation technique called the *fishbowl*, in which the dialogue is facilitated between a subset of the participants who sit in the middle of the room ("the fishbowl"), while other participants listen and watch from the sides of the room, or "outside the fishbowl." This helped the tool meet the intent of the exercise, which was to understand the perspectives held by leaders in attendance from community associations.

The probing nature of the Iceberg Model led the conversation beyond the discussions typically held in meetings on community-based marine conservation and helped tease out the relationships between issues like family planning and infrastructure development, and marine resource use and management, from the perspective of local leaders.

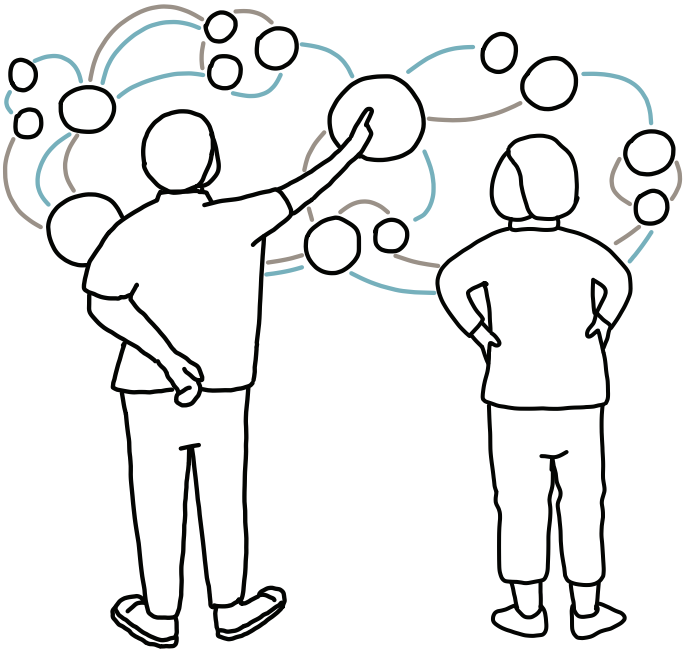
Notes were documented along with other insights from the workshop and learning processes. Many of the attendees in the workshop were later part of the institutional strategy or fundraising efforts where insights from this exercise and others were woven into proposals and project plans.

5. SYSTEMS MAPPING

Level of effort: Low-medium
Time required: 30 minutes - two hours (or more depending on available time and complexity of system)
Skills required: Basic facilitation

A system is a set of things that relate to and interact with one another. This interaction gives the system its own behavior. **Systems Mapping** is the process of mapping or drawing variables in a system, the relationships between them, and describing the types of system patterns and behaviors they produce. The term *causal loop modeling* (or *causal loop diagrams*) is often used interchangeably with systems mapping but is used primarily to describe a specific type of systems mapping that emphasizes identifying causal relationships, feedback loops, and system dynamics.

Systems are often complex: their parts interact in unpredictable and counterintuitive ways. It can be difficult to think through complex systems in your head — there are too many parts and relationships to be aware of. For that reason, it's beneficial to visually map the system with sketches, sticky notes, or digital tools.



The goal of mapping a system is to gain a better understanding of the underlying structures that cause problems. Even with just 30 minutes and a sketchpad, it can be an invaluable exercise to draw your understanding of what's going on so you can stand back and look at the whole system. To create a basic, useful systems map, simply complete steps 1–6 below in the time that you have.

The truth is that it is impossible to create a "complete" model of any system— there is no real boundary around the forces you're trying to understand. Systems Mapping is both a thrilling and challenging exercise because it can be hard to know when you're "finished" mapping. In truth, you are never really finished mapping. With more time and resources, engaging in robust mapping is extremely helpful — these processes can go on for days or even months. Long time horizons are especially helpful if you want to engage stakeholders from across the system in the mapping process. This gives them the opportunity to truly see one another in the system — to recognize good intentions and unintended effects — and this provides the foundation for true leadership and collaboration (Scheffer, et al., 2015).

Before getting started

In systems-change work, a map will always be useful. However, it is important to remember how much time and energy you have to dedicate to mapping before you start. If you only have half an hour, don't try to create a detailed model. Instead, follow steps 1–6 above to make a quick sketch of the system's story.

Instructions

1. **Start with the goal.** Begin by identifying the goal or target phenomena you aim to address — a clear problem statement. Describe it with a label or a sketch and put it in the center of your working area.

2. **Identify direct influences.** Next, identify anything that *directly* influences the phenomena on your map, and anything that *they* directly influence. In your workspace, describe those relationships.

3. **Keep mapping.** Repeat step 2, identifying and describing the direct influences on each phenomenon you identify. As you expand the map, you will likely identify many relationships between these phenomena.

4. **Look for behavior.** As you add relationships between existing phenomena on the map, you may notice loops or other patterns. What do these patterns mean for the behavior of the system? These feedback loops and other systems archetypes (Kim, 1994) are often the sources of counterintuitive and persistent behaviors that are difficult to address in complex systems. A note: finding

behavior is hard! Even experienced systems mappers can have difficulty doing this.

5. **Map until you reach saturation.** It can be difficult to stop mapping. As you get extremely detailed, it's hard to know what to exclude as "outside" the system. Generally, when you find that you keep thinking of phenomena that you've already accounted for, it's a good time to pause the mapping process (for now, at least).
6. **Tell the system's story.** Now that you have a good sense of the dynamics of the system, return to why you started mapping to begin with. What is the core problem you're addressing? Using your map, tell the story of how the system perpetuates this problem. It can be helpful to create a slideshow or a separate sketch telling this story, with snippets taken from your map. The kumu.io web platform has a useful feature for turning virtual system maps into presentations.
7. **Get feedback.** Share the system's story with others who were not a part of the mapping process. Ask them for feedback on the map. What's good? What's missing? What's incorrect? Are there any "sticky" dynamics that are missing, or relationships that haven't been captured? With this feedback, repeat steps 2–6.
8. **Repeat** steps 2–7 as many times as you'd like or have time and resources for.
9. **Use the map.** Creating the map is a process that helps foster *systems thinking*, but maps can also be incredibly useful artifacts to continue conversations with actors in your system. Using your map may mean you simply repeat step 7 again and again, and iterate on your understanding of your system as you move through time. You may also use your map to reflect on how things could change in possible futures (Step C), to brainstorm possible actions for changing systems, for developing and communicating theories of change and action, and in sensing change in your system as you learn your way forward.

Tips for facilitators

Remember that the most important takeaway from Systems Mapping is not the map itself, but rather the territory it helps you see. That territory is revealed through the conversations that happen throughout the mapping process. Those conversations and the insights they offer are the real takeaways.

To that end, stay focused on answering questions. Mapping is not an end, it is a means. Don't engage in mapping for the sake of the map — instead, ask questions about the system that will help you design more effective interventions, and use mapping to answer those questions.

Uncovering hope as a leverage point for change

A network of development and conservation NGOs was interested in safeguarding the future of coral reefs within a changing climate. To understand the system and identify strategic actions, the network convened a series of national-level workshops over two years to discuss the state and future of coral reefs with people from resource-dependent communities, non-profits, and governments. Through these workshops, participants discussed the challenges and opportunities facing coral-reef conservation and their hopes for the future. All this created a "systemic understanding" of the environmental, economic, and social aspects that influenced the history, current state, and future of coral reef ecosystems.

Two years of learning created a lot of ideas for action. To help prioritize actions into a global fundraising strategy, the initiative's core team (with the help of a colleague and consultant with experience developing collaborative system maps) created a systems diagram using **Systems Mapping** to summarize the collective "mental model" of coral-reef conservation. The map utilized artifacts from the first two years of the program, which included notes, reports, and photographs from the many workshops and meetings that had been held to understand the different needs and perspectives in each country where the initiative was to operate. The map was created using the web platform Kumu.io, and a mathematical-leverage analysis was carried out using the platform so as to quantitatively identify system features and possible points of leverage that had not already been specifically raised by stakeholders in the workshops. While many of the leverage points that surfaced were intuitive, *hope* emerged as an unexpected point for change. While stakeholders had emphasized the hopelessness of coral reef protection in many of the workshops, none had called it out as an area for possible action. The lack of hope for coral reef conservation was a shared mental model held by many in the system, who were struggling to reconcile the threats to people and marine ecosystems today. But could it be possible that addressing this lack of hope in coral-reef conservation head-on could unlock other areas of leverage?

The outputs of the leverage analysis were presented and discussed by project partners. These helped the team realize that hope was a new way to consider shared challenges, changing the tone and direction of the planning meeting. The team discussed how they needed to find new ways to break this sense of hopelessness, despite hope being — as one participant put it during a planning call — "slow to build, quick to die."

6. VISUALIZING SITUATIONS AND CHANGE

Art has a special ability to transcend intellect and appeal to our emotions and senses — a space where science often fails (Scheffer, et al., 2015). By tapping into our innate imagination and creativity, art can help us look past what we see in front of us, and move beyond our immediate sensory experiences, opening up pathways to different perspectives or radically different futures.

Here we introduce two approaches — one simple and one more resource-intensive — that leverage the visual arts to understand perspectives on a Systems Journey. The first is a light-touch facilitation approach called *Rich Picture*, and the second is a deeper engagement approach called Photovoice, which uses photography.

Approach 1: Rich Picture

The term *Rich Picture* was first used in the 1980s (Checkland, 2000) to describe a methodology in which individuals or groups explore, acknowledge, and define a situation through pictures. Pictures and images created through a Rich Picture exercise can open discussion and dialogue, and help members of a group come to a shared understanding of a situation. Rich Picture is most often used early in a Systems Journey but can be employed at any time when clarity on different perspectives within the system is needed. Rich Picture is especially helpful when language barriers exist or if people come from different backgrounds and have difficulty conversing about a given topic.

Level of effort: Low
Time required: 1–2 hours
Skills required: Basic facilitation

Before getting started

Define your intent. Like any tool, it's important to be clear with yourself what function you want your Rich Picture exercise to have. Starting with a problem statement or question for participants will be helpful. Know that this intent will likely change over time as you learn with your group.

Consider group dynamics. The main goal of a Rich Picture exercise is to prompt a dialogue among participants using images as anchors for discussion. As with many tools on the Systems Journey, it's important to consider who needs to be in the room to have the conversation needed to serve the intent.

Prepare your materials. Rich Picture exercises rely on simple, hand drawings that can take many forms depending on the context in which you're working. Ensure you have materials to suit your context, such as pens, pencils, markers, and paper. It's often best to use large sheets of paper to facilitate group drawing and reflection. If you're working in a context where using these materials are difficult (e.g., outside) you can get creative and invite participants to use natural materials available to them to create a visual (similar to the future-looking **Rapid Cycle Prototyping**). If you are conducting the exercise remotely, ensure that participants have access to the materials they need where they are (e.g. pens, paper, cameras to take pictures of drawings to share), or consider what digital tools can facilitate image creation (e.g. drawing using tablets or creating collages in Powerpoint).

Instructions

How you run the exercise will depend on your intent, the size of the group that you're working with, and your location (indoors in-person, outdoors, or virtually). Here we give approximate instructions, drawing heavily from existing guidance on Rich Picture, but you can modify the approach to fit your needs.

1. **Create groups and share materials.** Many guides for facilitating Rich Picture exercises suggest groups of approximately 5–7 people, though this can be modified based on how many people you're working with. Share the materials with the group.
2. **Asking your framing question.** No matter at which stage in the Systems Journey you are, using Rich Picture, you will be asking participants to describe a situation. This situation might be part of the current system, a possible future, or the situation before, during, or after a particular action. Make your framing question clear to participants to ensure the exercise is successful.

3. **Keep asking good questions.** The main goal of a Rich Picture exercise is to facilitate dialogue around drawings. Good probes can ensure that conversations touch on deeper issues that may be sitting beneath the surface. Odken (2014) suggests probing around:

    - **Structure** – This can include organizational structure, geographic location, physical layout, and all the people who are affected by the situation.
    - **Process** – This refers to flows or transformations that occur within the structures such as flows of goods, information, or resources.
    - **Issues, hopes, and concerns** – Probing these involves asking about the motivations and perceptions of each of the key stakeholders in this situation.

And finally, don't forget that ***we are all part of systems.*** Probe participants to include themselves, and their roles and relationships with the key actors, structures, and processes

Points to remember

Odken (2014) also made a set of useful observations on Rich Picture as a tool.

They are messy – Rich Pictures are not meant to be perfect. They are roughly drawn only to convey a point. As a facilitator, it's important to positively reinforce all attempts at drawing. Encourage the use of simplistic images like stick figures and other quick ways to communicate complex concepts.

Words are okay — Sometimes it's difficult to visualize a concept (just as sometimes it can be difficult to put a concept into words), so it's okay to mix words and images.

A lot can happen in a little bit of time — Rich Picture exercises don't need a lot of time. Many different ideas can be collected using images in a short period of time.

Rich Pictures for reimagining community-led conservation

In a three-day workshop, representatives from community management groups, government, and NGOs were convened to explore opportunities for supporting and scaling community-based conservation. Several tools, including Rich Picture, were used to facilitate dialogue across and within these different stakeholder groups. Rich Picture was used to anchor group discussions in which members of the same community resource-management group explored current barriers, opportunities, and hopes for the future.

Using Rich Picture was helpful for a number of reasons: first, with its emphasis on creativity, the conversations the groups had were much more lively. Second, using images as anchors helped force the conversation to move from high-level ideas to specifics, prompting the groups to ask more specific questions about the current state of community-based conservation, and which specific relationships and components were helping or hindering progress. And third, the pictures were helpful anchors for reporting back to the other small groups, where some language barriers existed. This particular gathering was the first time the many different community-led fisheries management groups met, so reporting back discussions, in this case, was just as important as the conservations each group had on their own.

Approach 2: Photovoice

Level of effort: Medium to high
Time required: 2–3 days to spread out over 2–3 months
Skills required: Qualitative research, facilitation

Photovoice is a method designed to enable groups of people to share their experiences through photography and digital storytelling, with the ultimate goal of advocacy and change. Photovoice occurs through a series of focus groups or interviews between a facilitator and participants, in which basic photography skills are taught (as needed) and participants take photographs of things they find to be important, often within the frame of a particular theme or question. Photos are then discussed, providing a rich narrative and context for the images, and can be used as a vehicle to communicate needs and concerns from less powerful individuals or communities to those with more power or agency.

At the heart of the method is providing those that are often the subject of photographs and debate to take an active role in global dialogues on environmental and social change. By being photographers themselves, participants are given the opportunity to shape their own narratives and the stories that are most important to them.

Photovoice has been applied widely in social advocacy work[3] and has been used in interdisciplinary research contexts, including public health and environmental research, specifically for understanding local perceptions of the impacts of climate change and conservation interventions.

Photovoice can be a very sensitive tool to use. We highly recommend working with a trained facilitator or researcher with experience in participatory methods. Here we outline the process for a Photovoice activity but recommend you consult the additional resources found at the end of this tool for much more detailed guidance and advice to ensure that your activity achieves its desired goals ethically and effectively.

Before getting started

Learn the basics. Photovoice is a participatory process that requires thoughtful and skilled facilitation. The organization PhotoVoice (photovoice.org) offers 1- to 3-day training sessions, otherwise, it is recommended to work with a trained facilitator or researcher with experience in the method.

Define your intent. Having a clear idea of your intent for your Photovoice exercise is important. This will frame how you introduce and carry out the exercise. Starting with a problem statement or question for participants is helpful — and know that this intent will likely change over time as you learn with your group

Find your volunteers. It's best to seek out volunteers to participate in your group. Photovoice is meant to be an empowering, engaging activity, so forcing people into it never works. It's helpful to have your intent captured (in the right language) in a format that you can share (orally or written).

Instructions

During your first meeting, it's helpful to review a number of things with your participants before starting photography:

- An introduction to the project and your goals
- An introduction to cameras and photography (if needed)
- A presentation of the photography exercise with questions

3 PhotoVoice.org

1. **Say thanks!** First, be sure to thank your participants for coming. Participants are not only offering their time but are also sharing an intimate view into their lives. While expressing gratitude, give them an overview of why they are there.
2. **Introduction to cameras and photography (if needed)**. Give a brief introduction to cameras, keeping in mind that experience may be mixed. Don't single out or embarrass anyone who might know very little about cameras. Emphasize the ethics of photography. In Photovoice, the researcher/facilitator has less control compared to a typical interview or focus group, as individuals outside of the focus group become engaged in the project through participants. Make sure participants are aware of the need to ask permission from the people they photograph before they take their pictures.
3. **Frame your question.** The goal of this exercise will vary depending on where you are in a journey, but it's most common to use it to understand the system. You might be asking broad questions about what's important to people, or be trying to understand different relationships between people or people and their environment. To help guide participants' photography, briefly introduce your intent again and have a short discussion of the questions to prompt thinking. Save the detailed discussion for after the photography exercise. Use simple, clear language to introduce the intent, such as "We are interested in learning how people in XYZ Community adapt to change."

   After introducing the topic, show participants how to document their responses through photos. Ask what they would imagine taking pictures of and see if they can share ideas with one another. Encourage creativity. You may also use your own personal photographs and narratives as examples of how you would show themes through photographs. Have some extra pens and paper (if relevant) that participants can take with them as they go off to photograph, so they can make notes as to why they take the photos they do. These field notes may help you later in writing captions for the images.

   A key difference between photovoice and standard qualitative interviews is that some power over the direction of the conversation is handed over to the participants. You want to give enough guidance that participants have direction, but not too much that creativity gets lost.
4. **Informed consent and copyright.** For any type of research or information-gathering process (formal or informal), it is vital to obtain informed consent from participants, especially for photography. Ideally, participants would have already given consent at the time you invited them to participate, but now is the time to reiterate that participation in this exercise is purely voluntary. You also need to discuss the copyright of the photos, and how they will be used. Ask participants if they are comfortable with their real

name being used with their images and stories, or if they prefer to stay anonymous.

5. **Start the activity.** Time for photography! This will vary depending on location and resources. You may photograph on one day as a group or distribute cameras and allow participants a few days to take their own photographs. In some cases, people might be able to take photos with their own cameras or smartphones. Encourage participants to take notes as they photograph. Suggest a maximum of 25 photographs to encourage a focused approach.

6. **Bringing it together – discussing photographs.** It helps to audio record the discussion for reference when synthesizing your notes and findings, to ensure you accurately portray your participants' reflections. Again, obtain consent for audio recording from all participants. In some cases, it's better not to record so that the group feels safe speaking truthfully. If this is the case, take good notes.

   Outline how you will lead the discussion so everyone knows what to expect. How you facilitate this will vary if you're using print photos versus digital photos. You can do this virtually if all participants have a strong internet connection. Individuals can share their screens to show their images.

Give participants time to decide on three images to share. Each participant will initially present their images with a verbal (or written) caption on why they took the image, and how it relates to the questions asked. Ask participants to clearly state which image they are referencing using the file name or a detailed description.

Following the presentations, the whole group can discuss any findings or insights. You can use other images to help spark discussion or to prompt questions. Allow time for participants to voice any other concerns or hopes that they wish to share.

Close the session by once again thanking participants for their time. You may also discuss with the group how they want to use the insights and/or display photos in their own communities to meet their own goals.

Photovoice to understand community-based conservation

Photovoice was used to understand how members of fishing communities perceived community-based marine protected areas (MPAs). Thirty-six participants from communities adjacent to two community-based MPAs were involved based on willingness and interest. The participants belonged to one of three resource user groups identified by prior research: spear-gun fishers, gill-net fishers, or fish traders. The process was trying to understand and disaggregate these groups' perspectives.

The process was explained (verbally and written) in an inception meeting in the communities. Participants signed consent forms and were given disposable cameras. The inception meeting also covered basic camera care and how to take a photo. Disposable cameras were used so more participants could engage and easily take photographs over a longer period of time. The prompts given to photographers were:

- Can you photograph what in nature/the marine ecosystem contributes to your wellbeing?
- Can you show through your photographs how/if your well-being has changed as a result of the implementation of the [marine protected area]?

The facilitators showed a few examples from both local and foreign contexts to illustrate how one might photograph such complex relationships. Only a few examples were shown to avoid them influencing photographer behavior. After one week, the cameras were collected and photographs printed. Focus group discussions were held during which photos were distributed and discussed. After having time to review all images, participants were asked to select their top three and share either a verbal or written caption for each image with the group. Discussions focused on how the MPA affected their communities.

Discussions were recorded (with participant permission) and later transcribed, translated, and analyzed as qualitative data. This data informed a scientific study that explored the perceptions of community-based marine protected areas and uncovered some of the nuanced ways in which the protected area created costs and benefits for different community members. The results also provided insights into communities where a conservation NGO had ongoing activities. To share results back to the community, images were made into posters that included a short, written description of the findings of the exercise.

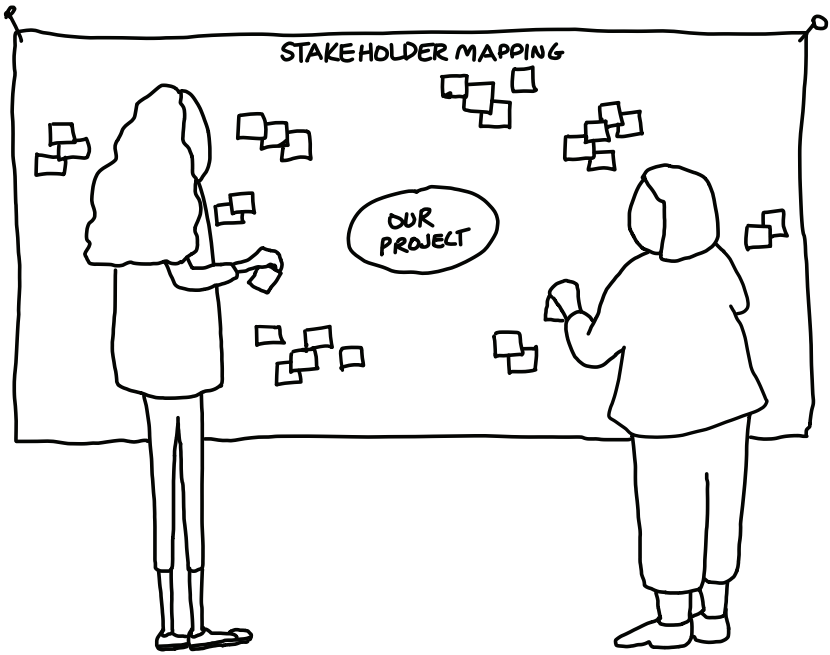
For more on this case see Mahajan and Daw (2016) and Masterson, Mahajan, and Tengö, (2018).

7. STAKEHOLDER MAPPING

Level of effort: Low to medium
Time required: 30 minutes to several days
Skills required: Facilitation, research

Stakeholder Mapping is a tool to visualize the many ways in which human networks and interactions create our systems and their roles in implementing change. Here, we introduce three approaches that can be used to describe and analyze stakeholders and their relationships to change: 1) simple stakeholder analysis, 2) social network analysis, and 3) power-versus-interest mapping.

Simple stakeholder analysis helps us understand stakeholders as people. It reveals groups within the system that have shared interests. This knowledge helps us draw boundaries around who is part of our Systems Journey.



Social network analysis explores how stakeholders are connected to each other (or not) and helps us understand the relationships and flows between different stakeholders.

Power-versus-interest mapping explores power in human relationships and networks and asks how power has impacted the world as we know it, as well as how we might hope it will in the future.

These three different approaches can be used together or separately and repeated throughout the journey in varying levels of detail depending on the type of information or insights needed and the time and resources at your disposal. Choose the approach or combination of approaches that make the most sense for where you are. Altogether, these three approaches can help to create layers of information that describe stakeholders' characteristics, the relational aspects of stakeholders and networks, and the flows and implications of power and interest in human networks. And remember, it is important to always consider our own role in the system, so make sure to include how you, your core team, and perhaps your organization feature in these stakeholder maps. This can help ensure that you continue to recognize the role you play in the system, creating the space to interrogate your biases, limitations, power, influence, perceptions, and strengths.

Before getting started

Ideally, stakeholder mapping happens through co-creation with a diverse range of people who have hands-on knowledge of the geographies, decisions, histories, relationships, and processes (natural and human) surrounding your project. It is wise to pay careful attention to the power dynamics in a stakeholder mapping group. Ask:

- Are there people who would not speak up in front of others?
- Has trust been built in this group to speak openly about issues like power and networks?
- Is there a balance of people so that you don't unintentionally create blindspots or marginalize particular viewpoints?
- Would anyone suffer harm or be put at a disadvantage due to culture, gender, or hierarchy?

These dynamics affect how accurately your system will be described. Remember, mapping stakeholders can be subjective — people may not be aware of how others perceive their power, role, or influence in a network.

You do not need special tools or skills initially to undertake stakeholder mapping. In fact, the process works well with paper, pens, sticky notes, or on a virtual platform like Kumu, Miro, Mural, or Jamboard, or almost anything else you have at your disposal. People can relax and become creative in the physical process of stakeholder mapping. However, it is important to

find a way to capture the outputs (take a picture, transcribe, etc), as they make useful baseline inputs into project plans and other documents, and they show how the co-creation process is adding to your project.

Also, consider what must be done in person and what can be done asynchronously. Some approaches, such as the simple stakeholder analysis, may initially be done together but can then be completed individually in more depth.

For a workshop-type session, set up a space that encourages discussion and sharing, and allows for break-out groups. Have enough supplies for everyone.

Instructions

Approach 1: Simple stakeholder analysis

1. **Identify stakeholders.** Start by asking everyone in the group to note down as many stakeholders as they can think of. If you use sticky notes, these can be shared on paper or wall space.
2. **Create clusters**. Begin "clustering" the notes together based on categories or broad groups of stakeholders. You can keep it open to refer to individuals or whole organizations – use a group discussion to determine the level that makes the most sense for your intent.
3. **Diagram your stakeholder groups.** After you have finished clustering, you should end up with a simple diagram of stakeholder groups and have captured specific organizations or people that relate to your context.
4. **Gather deeper information.** Work out-of-session to design a detailed information-gathering process to understand these stakeholder groups, their characteristics, and organizations and how they relate to the situation, problem, project, geography, etc.
5. **Create your final output.** The final output from this exercise may be a network map that depicts the relationships between actors in the system, accompanied by a detailed report containing detailed information in narrative or table form.

Approach 2: Social network mapping

Social network mapping, or just network mapping, is focused on understanding the relational parts of our systems, such as how stakeholders connect and flow (knowledge, decisions, power, funding, time), how strong connections are, and whether relationships are reciprocal. Network Mapping can uncover bottlenecks, reinforcing relationships, opportunities, and potential weaknesses. It helps to capture relationships that do not exist yet.

Depending on the size and scope of your project, break participants into smaller working groups.

1. **Identify stakeholder groups**. Using pen and paper, ask groups to identify the project or the key organization first. Then, discuss the people, organizations, and relationships relating to the project (or use Approach 1: Simple stakeholder analysis, see above). Draw circles and arrows connecting stakeholders to show relationships. This will likely expand outwards and can include both individuals and organizations. Encourage groups to be as specific as possible. Arrows can show single or bi-directional and weak or strong relationships. Also include notes on potential opportunities and issues. Note down any disagreement within the group about particular relationships. Interestingly, in some previous cases, conservation groups have added other species as key "stakeholders" to show how they exert influence within the network.
2. **Share your maps.** Once this has been completed, share the maps among the groups. You can facilitate a Q&A session and provide prompts that relate the maps to your current phase of the journey. Prompts might include: What surprises you about the map? Who is missing? What do different stakeholders want? Who holds power? Where are connections strong versus weak? Where could new connections be made or strengthened?
3. **Iterate.** Return to your map as often as you need, to build on or change during the Systems Journey. It is a useful tool for revisiting assumptions made along the way and how true they proved to be over time. Maps can be photographed or turned into digital diagrams that can be adapted and shared.

Using stakeholder maps to challenge assumptions

A common causal pathway in many theories of change is that producing more knowledge or science on a topic will help change a policymaker's decision about an issue. But oftentimes, our network maps reveal very few direct connections to these policymakers and those who may be producing the scientific reports. Recognizing this gap often leads to critical conversations about how a team might facilitate communication, co-creation, relationship building, risk management, and network development that might help catalyze the change a group seeks. This example shows how stakeholder maps are powerful tools that can surface gaps in logic in how people think change will happen and how other individuals or groups behave.

Approach 3: Power-versus-interest mapping

Power-versus-interest mapping builds on the first two approaches. Once you have identified key stakeholders, their relationships to the situation, and the boundaries of networks, you can discuss differences in how people perceive the power, interest, and influence of these stakeholders. Groups should also account for how others perceive their own power or interest.

It is important first to define "power" and "interest," as these are relative terms. Common definitions are:

Power is the realized ability to control, exert authority over, or influence others.

Interest is the feeling of a person whose attention, concern, or curiosity is particularly engaged by something.

1. **Begin with a grid**. Have group members map stakeholders onto a grid like the one shown in Figure 5. Stakeholders should be placed where they are perceived to be now.
2. **Discuss the current state**. Group members should then discuss the current state of the system and how they would like to see these relationships change (or stay the same) in the future. It is useful to probe risk, communication strategies, co-creation engagement, budget allocation, project scope, and assumptions about change. Depending on what phase of the journey you use this tool in, specific probes related to your orientation, leverage analysis, or systemic theories of change can be included to uncover more insights about power and interest.

3. **Document the outputs.** Outputs from power versus interest mapping may be notes on the grid itself, annotations on a systems diagram, or simple notes about key stakeholders. These "social" insights are critical and can help inform how you might engage or follow up with actors in your system at different points on the journey.

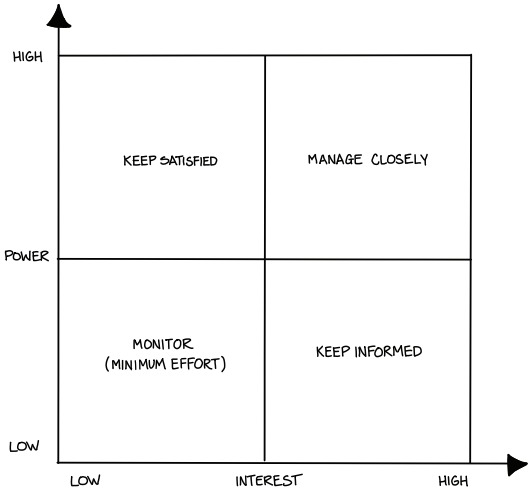


Figure 5: Power-versus-interest Grid

Tips for facilitators

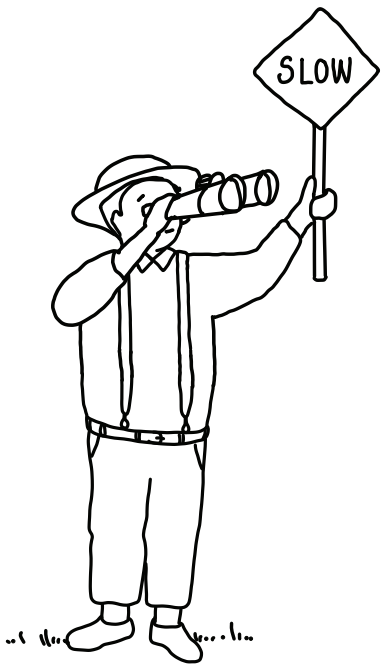
- Be prepared for **unexpected dynamics** between participants. Discussing power and relationships can be very triggering for some because of past experiences and/or trauma that might exist in the systems that they are part of.
- Keep people **curious** about stakeholders' characteristics through prompts and reminders that those outside the exercise might view these characteristics differently.
- Use probes to **promote humility and self-reflection.** You can ask participants how they would act in various situations or if they were in the place of stakeholders they are discussing. This can help participants see themselves in the system and set realistic expectations of others. It can also reinforce the strength of collaboration.
- Ask the group **how it might be possible to talk "with" and not "about"** others in the future. Probe how co-creation may be better enabled. There might be

good reasons why this is not possible or desirable, but asking helps the co-creation process to evolve.

- Encourage people to **see gaps in knowledge** not as failures but as opportunities to research, reach out, and form new relationships and expand the co-creation process.
- **Connect to your phase in the Systems Journey** to ensure the Stakeholder Mapping exercise is useful for the group.

Proceed with caution!

- If the power dynamics are too unstable or not enough trust has been built, it might not be a good idea to do these exercises with a large group. It can be easiest to start with desktop research and move into participatory processes later in the journey.
- If relationships are fraught or complicated in your system, you may need to keep stakeholder-mapping discussions "closed" with edited outputs. Part of the activity of discussion is to share what you've learned and build trust in the group. Facilitators should be clear about what will and won't be recorded.



Mapping stakeholders, power, and relationships

A consortium of partners from four countries came together to identify ways to collaboratively and sustainably manage forests for both people and nature. To better understand who needed to be involved in their initiative, the consortium used **Stakeholder Mapping** to better understand the relationships and power dynamics between actors in their system.

During the exercise, participants were asked to form small groups and were given large pieces of paper to document the exercise. To start, groups wrote the name of the project in the center of the paper and were then asked to write the names of key stakeholders involved in or related to the project. As they added new stakeholders to the map, they discussed the *theory of change* they wanted to catalyze and how different stakeholders in the system could contribute to creating change. Their discussions focused on how they thought stakeholders would act, which of the stakeholders had the power to act, and how this related to the stakeholder's interests.

After drawing maps in small groups, participants reviewed each other's maps to see how others perceived the relationships between stakeholders in different countries, and how these relationships were connected to the fundamental challenge they were trying to solve. This helped participants better understand why different interventions for managing forests were needed in different contexts. The process of reviewing each other's maps also helped to foster empathy between those who had previously disagreed about what the "right" solution should be. It also showed that there were different leverage points in each geography, as well as practical implications around timelines, differences in political systems, and budgeting needs in each context.

8. RAPID CYCLE PROTOTYPING

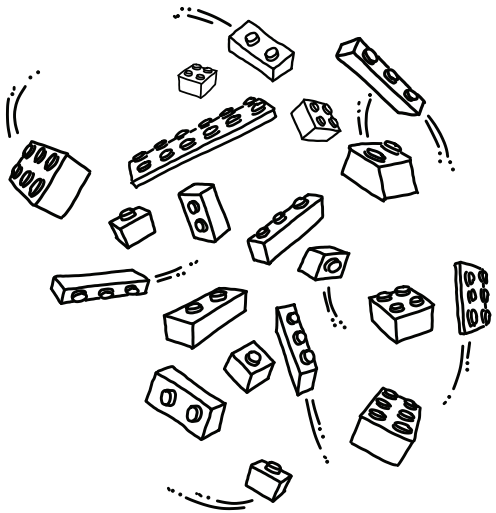
Level of effort: Low
Time required: 30 minutes to 2 hours
Skills required: Basic facilitation

Rapid Cycle Prototyping methodologies have roots in the software and design fields and are used to test and explore ideas quickly and iteratively, contributing to collective learning and adaptive management. Rapid Cycle Prototyping can be used to bring clarity to a current situation or can be future-oriented to explore how possible solutions might have impacts in the real world.

Creating physical *prototypes* (models or experiments) makes ideas tangible and can allow for deeper dialogue with other stakeholders in the system. They shed light on areas of resistance and uncover ways to move past them. Prototypes are meant to be rough and imperfect to help people grapple speedily and playfully with problems and their possible solutions. This encourages people to let go of (often deeply rooted) attachments to how the world works and their own assumptions about how a specific solution might lead to outcomes.

Rapid Cycle Prototyping consists of different "cycles" of feedback that facilitate knowledge exchange and offer evidence of what might work. Groups can easily revise and adapt ideas with minimal resources. A key objective of prototyping is to let go of ideas, make mistakes, and use these mistakes to adapt and improve ideas.

Here, we describe how to use Rapid Cycle Prototyping in a "planning" environment (like during Phase 1 or 2 of the Systems Journey). There are tips in the box on LEGO® Serious Play below for how you might apply this tool during Phase 3 as you *learn your way forward.*



Instructions

1. **Gather materials.** Rapid Cycle Prototyping can be carried out using any materials you have. A creative facilitation kit could contain creative materials like small objects, clay, paper, markers, or building blocks. Even simple objects that a group has to hand — inside or outside — such as bags, books, stones, leaves, or other natural objects will work.
2. **Pose a question** that will prompt a model of the current reality of the system (i.e., What are things like right now?), a potential solution/intervention, or an ideal future state of the system. Try not to spend a lot of time setting up prescriptive exercises. Instead, encourage participants to start playing with the materials and see what comes out of it; allow yourself to be surprised!
3. **Give time.** Offer participants around 10 minutes to build a model on their own. Depending on the cultural context of the group, you might need more or less time for this initial building process. Participants can construct this first model as individuals or in small groups.

Lego® Serious Play®

The LEGO® SERIOUS PLAY® Method is a specific Rapid Cycle Prototyping approach. It centers on a facilitated discussion and problem-solving process in which participants are led through a series of questions probing deeper and deeper into a topic. In the LEGO® SERIOUS PLAY® Method, participants build 3D LEGO® models in response to a facilitator's questions. These serve as the basis for group discussion involving knowledge sharing, problem solving, and decision making.

The ground rules for Lego Serious Play are useful for many types of Rapid Cycle Prototyping exercises.

- Everyone participates
- If you don't know what to build, just start building
- There is no one right way to build
- Your model means what you say it means
- Always tell a story referring to your model
- Start with individual models, then share, then integrate

For more, see Kristiansen and Rasmussen, 2014.

4. Have participants **tell the story of their model** to the others in their small group. Presenting the story of a model is another form of iteration and helps participants work through the idea they are presenting in a new medium (spoken instead of visual)
5. Ask each group to **combine their models.** What they build together should contain all of the important aspects of the individual models. This is yet another iteration that allows the idea to grow and change based on input from others.
6. Once models are combined, ask one member of each group to **present their combined model to the larger group** or a neighboring group for coaching input. Directly following each presentation, the neighboring group can ask questions. These create yet another iteration of the model. Possible prompts for "future-oriented" models include:

    a. Does the idea have the potential to be successful?

    b. Does the idea have the potential to gain ownership by others in the system?

    c. Does the idea have a high potential to create disruptive change and move toward the systems-change outcome?

    d. Is the group who built the model excited about it?

7. Based on feedback, the groups can make another **round of edits** or modifications to the model.
8. **Different pathways to end the exercise.** There are several ways you can end the exercise depending on your intent. If your goal is to refine and reconcile the different ideas in the group, you can keep going through iterations of models to understand the areas of divergence and convergence in the group. Eventually, participants may come together around one shared model, which can then be used as a vehicle to move forward in the Systems Journey. Alternatively, you may identify future actions needed to reconcile diverse understandings of the system. You might also be striving to identify sets of solutions based on models and can, as a group, "pressure test" ideas to inform which actions you might implement. Do this by **voting on solutions sets:**

    a. Form groups around each of the highest-potential solutions created using models

b. As the group what it would take to implement this solution. Note that forces could be: political, legislative, economic, social/cultural/religious, or other

- What force(s) will enable the solution to work?
- What force(s) will impede the solution from working?

c. For each force, identify its relative strength:

1 = minor
3 = moderate
5 = major

d. Determine approaches to address force field:

- How to strengthen enablers
- Mitigate against barriers

e. Ask who would need to have ownership over the solution in order for it to be successful.

9. **(Optional) Moving to actions.** If your intent was to identify actions for systems change, you may close the exercise by identifying the steps needed to implement the solution. Given you have brought participants into the experimentation mindset, you can also probe participants to make plans on how they might set up these actions as real-life experiments and build in ways to iterate on the ideas with stakeholders throughout implementation.

Bringing experiments into the real world

Rapid Cycle Prototyping is a great facilitation exercise and tool, but it's important to remember that the spirit of "experimenting iteratively" can and should follow you beyond the workshop setting and out into the real world. It is possible to use some of the workshop-friendly guidance above to shape how you set up your actions and interventions as experiments in **Phase 3: Learn and adapt** and create deliberate time and space for learning.

To create an ethos of experimentation in the real world you might try:

- Delineating a handful of interventions/actions in a proposal or a program's work plan as experiments. Scharmer (2007) introduced seven questions (known as the "7 Rs") to help groups identify which prototypes might be most successful in the real world.
    - Is it relevant: does it matter to stakeholders involved?
    - Is it revolutionary: could it change the system?
    - Is it rapid: can you implement it and learn quickly?
    - Is it rough: can you do it on a small scale to facilitate learning?
    - Is it right: can you "see the system" in the microcosm where you will implement the prototype?
    - Is it relationally effective: does it leverage the strengths and competencies of existing stakeholders and networks?
    - Is it replicable: can you scale it if the experiment is effective? This typically requires the prototype to be locally owned with local capacity, and not need massive inputs of knowledge, capacity, or resources from the outside.
- Creating the physical and social infrastructure to facilitate learning. For example, build in the resources and time to iterate on and learn from experiments through learning events (e.g., scientific research, pre-, and post-mortem sessions) with system stakeholders. Ensure that other stakeholders know that it is an experiment so as to manage their expectations.
- Creating a reservoir of flexible funds that can be used to either scale up experiments or to "go back to the drawing board" in case experiments fail

Elevating perspectives on the future using Rapid Cycle Prototyping

An NGO convened a national dialogue on community-based conservation in the hopes of both slowing down to understand the system and creating a forum where members of community-based organizations and government from across the nation could meet for the first time to share experiences. The dialogue was designed to facilitate learning and knowledge exchange, as well as to identify ideas for actions that could create change that all participants could act on in their different roles supporting community-based conservation.

One of the tools used during the dialogue was **Rapid Cycle Prototyping**. In this exercise, the question from Step C was posed: "What do you want the future to look like for community-based conservation?" In small groups (3–5 people), participants built physical models using only materials they had in the room, like bags, pens, water bottles, and glasses. After 10 minutes, groups were paired with another group to present their models to each other. They shared how this future related to them as individuals and their role in conservation, asked questions about the other group's model, and combined their models into a shared model of their vision for the future. This went on for several rounds until there were two large groups with two large models.

Getting to the final models involved lots of discussions and negotiations about how and if different visions for the future could be combined or sit alongside one another, and which were incompatible. When it came time to present the two final models, the two models of the future were quite different, representing different stakeholders and perspectives (the facilitator let groups self-select as they were presenting to one another).

One group was comprised mostly NGO staff and national government representatives. Their model focused on a very optimistic and perfect future in which all of the conservation problems they were working on were solved. The second group included mostly participants from community-based organizations. Their model focused largely on the legal process of transferring rights from the government to community-based organizations. (It is also interesting to note that securing the rights to manage and make decisions around natural resources can be thought of as a leverage point for change that increases self-governance.

The differences between the models led to a discussion in which participants debated the intent of the exercise. This in turn allowed participants to realize that the two groups had two different views on what was possible and important for the success of community-based conservation. Community-based organizations believed that, if the process of transferring rights could actually work, they would achieve their goals. Those within government and NGOs (who were farther from the realities on the ground) did not perceive the transferring of rights to be such an insurmountable problem. The energy in the room shifted after the participants had this collective ah-ha moment.

Long after the dialogue, this insight led the convening NGO to think carefully about its own five-year strategy and to elevate the importance of community-based conservation in its work, with a special focus on the transfer of management rights and relationships between the government and community-based organizations.

9. SCENARIO PLANNING AND THE THREE HORIZONS FRAMEWORK

Level of effort: High
Time required: 2–4 hours
Skills required: Basic facilitation

Scenario Planning[4] involves imagining possible futures in order to be strategic in the present. The general idea is to look for trends or drivers of change and imagine their effects several years from now. Then, develop rich descriptions of the world you're imagining. Those rich descriptions are your scenarios.

Crucially, Scenario Planning — like all strategic foresight work — does not involve *predicting* the future. The goal is not to define what will happen, it is to think about what *might* happen. Thus, instead of predicting a *probable* future, in Scenario Planning you *describe possible futures*. For that reason, the more richly you can describe your scenarios, the more useful they will be for inspiring strategy in the present.

Scenario Planning is often used to develop multi-year plans set five, 10, or even 100 years in the future. This need not be the case, though. Depending on your timescale and how quickly things are changing in your system, you could use Scenario Planning to imagine futures a month or six months from now. The key is to be as realistic as possible about how fast and how dramatically things could change. If your scenarios are plainly fantastical, they will not hold much strategic value.

Here, we provide a simple method of defining four possible futures. First, through *environmental scanning*, you identify two *critical uncertainties*. These are trends that could go one way or another leading to very different outcomes. By intersecting two critical uncertainties, you define four possible futures. Next, you describe these four futures as well as you can — these are your scenarios. Finally, you'll walk your team through each scenario in search of implications for the present. Note that this is one method for developing future scenarios; there are many other approaches you could take to scenario development.

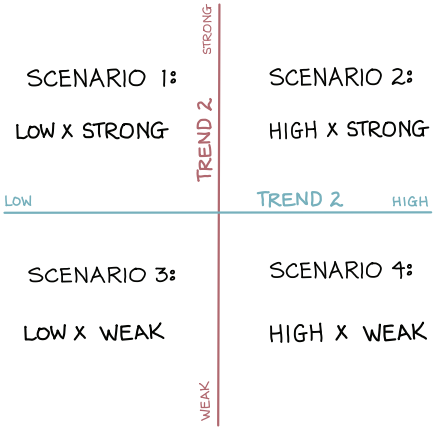
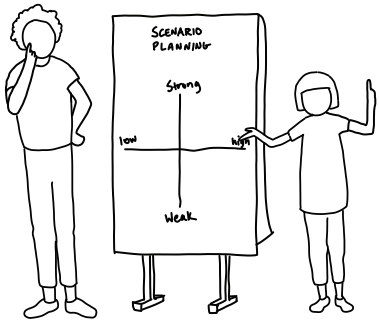


Figure 6: 2x2 Matrix – Scenario Planning Grid

4 *The Art of Systems Change, p.119*

Before getting started

Scenario Planning is best used to help explore uncertainty and possibility. For that, we need to use it to imagine the futures we are not readily anticipating. That's why it's important to engage in environmental scanning and to use the 2x2 matrix grid (Figure 6). These tools give the exercise structure and prevent people from exploring only preferential and known futures. Also, be aware that a Scenario Planning exercise that is not given sufficient time may introduce bias because people will focus only on the futures they've already imagined, including those they want or want to avoid.



Instructions

1. **Define intent and users.** As with all tools, start the process with a clear goal. What do you and others want to explore about the future? And do you have all the perspectives you need in the room to achieve this goal "well enough?" It's important to be user-focused during scenario planning to get the most out of the process (Ramirez and Wilkinson, 2016).
2. **Environmental scanning.** Brainstorm:
    - What signals of change are you seeing? What events, inventions, or other phenomena suggest something new is happening in your world?
    - What drivers of change are you seeing? What fundamental forces shaping your world continue to grow, wane, or stay stable?
    - What trends of change are you seeing? What shifts do the signals and drivers you've identified point towards?
3. **Identify uncertainties.** Given the signals, drivers, and trends you've brainstormed, select (via voting or consensus) 5–10 of the most important and 5–10 uncertain possibilities.
4. **Define the critical uncertainties.** For each of the uncertainties you've identified, what different ways might they unfold? For instance, you may have trends that either become strong influences over the world or only have a weak impact. Or you could have trends that may unfold in two drastically different ways.
5. **Define the possible scenarios.** Choose two of the most interesting and compelling uncertainties, and set them against each other in a 2x2 grid (see Figure 6). This creates four different scenarios: one at the intersection of each direction of each trend.
6. **Describe those scenarios.** Describe your world based on each of these intersecting uncertainties. How does this world affect the system you're

working within? How does it affect your key stakeholders? What is its impact on your initiative or organization? How does it influence the resources you rely upon? How does it change your collaborators or competitors?

7. **Experience these scenarios.** Share your descriptions with your team members or stakeholders. Ask: what should we do in each of these futures? If they were to come to pass, what would be our best courses of action? Consider using the Three Horizons Framework (below) to plan how your organization or initiative should respond to each scenario. Find common strategies that are effective across scenarios and identify unique strategies that would be especially useful in each. Consider using **Wind Tunneling** (p. 219) to test and organize these strategies.

Bonus: The Three Horizons Framework

One tool that shares an intent with and complements Scenario Planning is the Three Horizons (3H) Framework[5]. The process for 3H is simple — ask the following questions, in order:

a. Define the **first** (present) horizon: where are we now? What do we take for granted? What assumptions do we hold?

b. Define the **third** (future) horizon: what transformational or radical changes are taking root in this future? What new challenges or opportunities make you worried or excited about this future?

c. Define the **second** (transitional) horizon: what assumptions from the first horizon will be challenged by the changes of the third horizon? What about our understanding of the present is vulnerable to those future changes? How might we take advantage of these shifts?

By defining our ideas about the present, then the future, then the in-between, we can strategically bridge our current reality with the emerging possible.

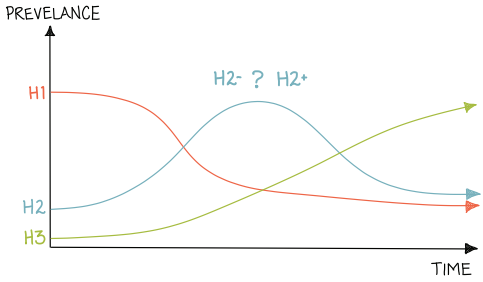


Figure 7: The Three Horizons Framework, reprinted from Sharpe, et al., 2016

5 *The Art of Systems Change, p.134*

Future food uncertainties

A research team was working on a project designed to help uncover possible futures for a national food system, with the ultimate goal of trying to understand and communicate how trends in the food supply, distribution, and demand were changing consumption.

The team chose to conduct a **Scenario Planning** exercise and began the process by reviewing the main trends that could possibly influence the current food system. The team named at least 12 different trends. Following a facilitated discussion, they identified two specific trends that were especially uncertain (hereafter: uncertainties) that they perceived to be the most critical for shaping food consumption futures. These became the anchors for the scenario development: food acquisition and food distribution. In the food-acquisition uncertainty, the team questioned how consumers would typically acquire food: global (all products are imported) and local (everything is grown/produced nearby). In the food-distribution uncertainty, the team discussed in what way a future food system would distribute food to consumers: low-tech (a food system that is not influenced by nor dependent on high-tech solutions) and high-tech (a food system that races to adopt and integrate high-tech distribution solutions).

To understand the implications of these uncertainties, the team developed four scenarios using the 2x2 matrix grid.

1. Global x Low-Tech: **Bazaar Experiences**. The team imagined a grocery store in which the "International Foods" aisle expanded to take over the entire store. Customers exploring the store would visit different locales and pick from produce and products central to the geographies represented by those regions.
2. Global x High-Tech: **"We Deliver Anywhere!"** This scenario consisted of a world where transport technologies facilitated cheap and efficient transit for products across the globe. Customers could tap "purchase" on a website to order international food products directly from suppliers in faraway regions.
3. Local x Low-Tech: **Chain Farmers' Markets.** In this scenario, the team described how the proliferation of farm-to-table philosophies could lead to farmers' markets replacing grocery stores. In this future, farmers and co-ops coordinate to provide locally-made food in highly social environments.
4. Local x High-Tech: **Farm-to-Tablet.** Farmers of the future are digital natives. In turn, farms are digitally connected: consumers can subscribe directly to their favorite farms for seasonal produce straight from the producer.

Naming the four scenarios, and being very specific about how the critical uncertainties played out in each scenario, helped make them accessible and useful to food system actors who see the system in different ways. And importantly, the scenarios were not predictive but were designed to elucidate the many different elements that could be realized based on the team's understanding of the current system and the emerging trends. After the exercise, the scenarios were shared with others working on different dimensions of the national food system, with the ultimate aim of helping consumers, markets, and producers to all better reflect on what a future food system could look like.

While this case illustrates a research-oriented approach to scenarios, in practice, scenarios are often developed collaboratively with participating communities, and designed as tangible experiences for stakeholders to participate in, learn from, and contribute to (Ramirez and Wilkinson, 2016; Candy & Kornet, 2019). For example, in "Causing an Effect" (2015), Kelly Kornet describes such a practice in which she engaged environmental activists in the creation of future artifacts through the technique of reverse archaeology, empowering strategic conversation about the activists' work.

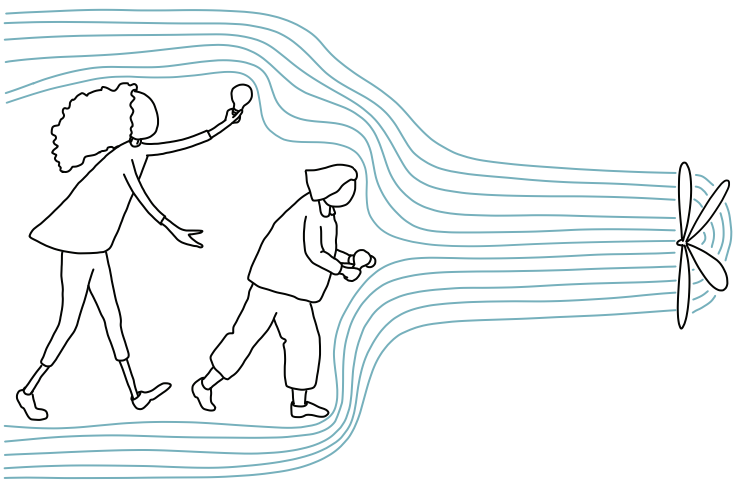
10. WIND TUNNELING

Level of effort: Medium
Time required: 30 minutes to 2 hours
Skills required: Basic facilitation and access to a set of future scenarios

The success of any given action or intervention largely depends on whether it is a good fit for the context and environment in which it is deployed. For this reason, it can be valuable to stress test the success of a strategy against the possible futures that may unfold in a particular environment or context.

Wind Tunneling is the practice of comparing possible actions or interventions against future scenarios. Implementers of the action or intervention can then make a more informed decision about whether an action might perform strongly or poorly in a given scenario.

To conduct Wind Tunneling, you must first have an action or set of actions ("interventions"), and a set of possible future scenarios (likely developed in Step E, Developing systemic theories of change and action, p. 111). These can be developed via **Scenario Planning** or created using narratives from existing, global scenarios, such as those produced by the Intergovernmental Panel on Climate Change (IPCC) or the Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES).



In the exercise, you will compare actions/interventions with scenarios. Through a facilitated discussion, you and participants will explore what each action might look like in each scenario, and will score their relative performances. The ultimate objective is to understand which actions and interventions may be strongest in different scenarios. Insights on how things might play out in different futures can then inform your decision about which actions you choose to prioritize and test in the real world.

In the instructions, we use a hypothetical scenario in which an organization is trying to encourage better household consumption practices.

Before getting started

Wind Tunneling is dependent on the scenarios used to assess your actions. If you do not have a strong set of scenarios or your scenarios do not differ from one another, this exercise will not be very effective.

Instructions

- **Create an action/scenarios matrix.** The matrix can be as simple as a table with the actions down the side and the scenarios across the top (see Table 9). If conducting the exercise virtually, this can be done with a whiteboard web tool like Miro or Jamboard, or if in person, drawn on paper mounted on the wall so participants can see it.
- **Compare actions with scenarios.** For each action-scenario pair, discuss the action's potential performance in the scenario. Probe with questions like:
    - How does this scenario affect key leverage points for this action?
    - How does the action shape the system's dynamics?
    - Does this scenario introduce new opportunities or barriers for the action?
    - Do the assumptions underpinning this strategy hold true in this scenario?

  Use any artifacts from the journey to probe questions about important parts of the system. Use the specific details from each scenario to help probe further.
- **Rank the performance of each action-scenario pair**. Based on your discussions, invite participants to give a relative judgment of the action's likelihood of success in that scenario. Probe discussion around these rankings: do the actions seem weak or strong? Why?

- **Use the information to decide which strategies to pursue.** Wind Tunneling is designed to be a simple and pragmatic exercise that helps move you out of theory and into practice in a participatory way. Typically, no single action or intervention wins in all scenarios. The discussions usually surface new considerations or ideas that can be used to help you and participants prioritize which actions you want to consider first.

Sample action/scenario matrix		
	Scenario 1: Urbanization slows Excerpt from scenario: In a world with more global pandemics, professionals choose to live and work in more remote areas.	**Scenario 2: Further urbanization Excerpt from scenario: In a world of growing healthcare costs and environmental concerns, populations stay concentrated in cities to access critical services and reduce environmental footprints.**
Action 1: Run a communication campaign	**Weak/Medium**: Hard to reach a rural population, but target population may still be urban	**Strong**: Urban centers are easily targeted with messaging
Action 2: Build new partnerships with service providers	**Medium**: Local partners can engage "on the ground" with households about their practices over time	**Medium**: Partners can provide access to households, but service provision is already stretched thin

Table 9: Sample action/scenario matrix

Assessing actions in uncertain futures

While there is a vast amount of research and resources on strategic planning and forecasting approaches, there are some easy tricks we can apply now into our day-to-day work. When assessing and ranking your actions under different futures, reflect on what *types* of actions you are really looking for given your context. Van der Heijden's "Scenarios, Strategy, and the Strategy Process" (1997) addresses four types of strategies:

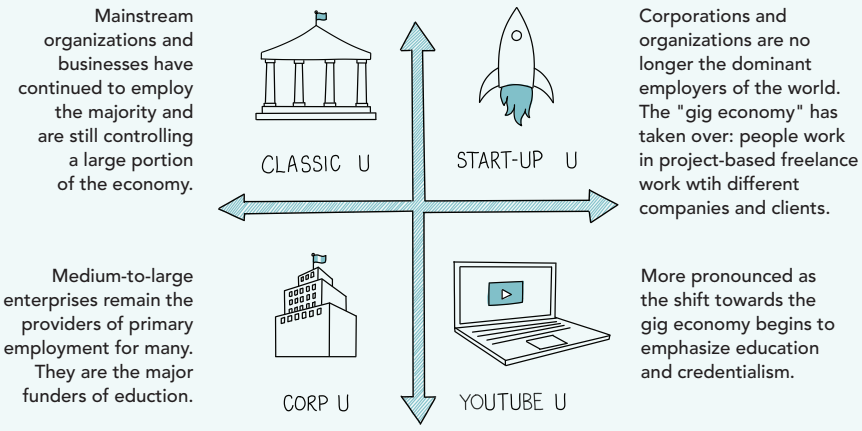
- A *robust* approach would mean choosing an action that works equally well in all scenarios.
- A *multiple coverage* approach would involve implementing multiple actions at the same time — this can be expensive, but if you can afford the effort, it allows you to be ready for many futures.
- A *gamble* approach involves going all-in on a single action or intervention that works really well in only one or a few of the scenarios. Taking a gamble is a good idea if you are fairly sure that a favorable future will unfold.
- A *flexible* approach means waiting and seeing. You avoid making decisions or spending resources on any one strategy or action for as long as possible so that you can take advantage of the future that evolves and make a last-minute choice. If you take this approach, it's a good idea to identify *scenario waypoints*: indicators that would help you understand that one of the futures you've imagined is emerging.

Tips for facilitators

When reviewing actions against possible scenarios, beware of stakeholders rooting for preferred futures and preferred strategies. Bias can enter this exercise through those two angles, at least!

Universities of the future

A university was renewing its strategic plan. A series of meetings were held with a diverse team of staff from across the university, during which seven different strategies were identified for the next 10 years. Each of these strategies leveraged the institution's strengths and addressed important weaknesses in different ways. They could not all be undertaken, so to decide the way forward, the team decided to test the possible options. To do this, they first conducted a **Scenario Planning** exercise that produced four plausible future scenarios:



The team then used **Wind Tunneling** to evaluate the strengths of each strategy against the possible futures of the university. The results are illustrated in the table below. The four scenarios are laid out in columns, while the seven strategic directions are labeled as rows. "H" indicates a high affinity (predicted strong performance) of the strategy in the given scenario. "M" indicates a medium affinity and "L" indicates a low affinity (predicted weak performance).

Going through the process of "testing" each option with the scenarios helped the team discuss the tradeoffs and eventually decide that "Bridging the Gap" was the most robust strategy. "Emerging Market Programs" was a gamble on the Classic U scenario. "Idea Broker," "Network Membership," "Mean & Lean Elite," and "Redegree" were all multiple-coverage strategies with different potentials in different possible futures. Finally, "Evolutionary Programs" was somewhat weak across the board.

	 CORP U	 YOUTUBE U	 CLASSIC U	 START-UP U
BRIDGING THE GAP	H	M	H	H
EMERGING MARKET PROGRAMS	M	L	H	M
IDEA BROKER	H	H	L	H
NETWORK MEMBERSHIP	M-L	M-H	L	H
MEAN & LEAN ELITE	M	L	H	H
EVOLUTIONARY PROGRAMS	M	M	L	M
REDEGREE	M	H	L	H

The team resolved to build out “Bridging the Gap” while drawing on some lessons from “Redegree” and “Idea Brokerage” as the way forward.

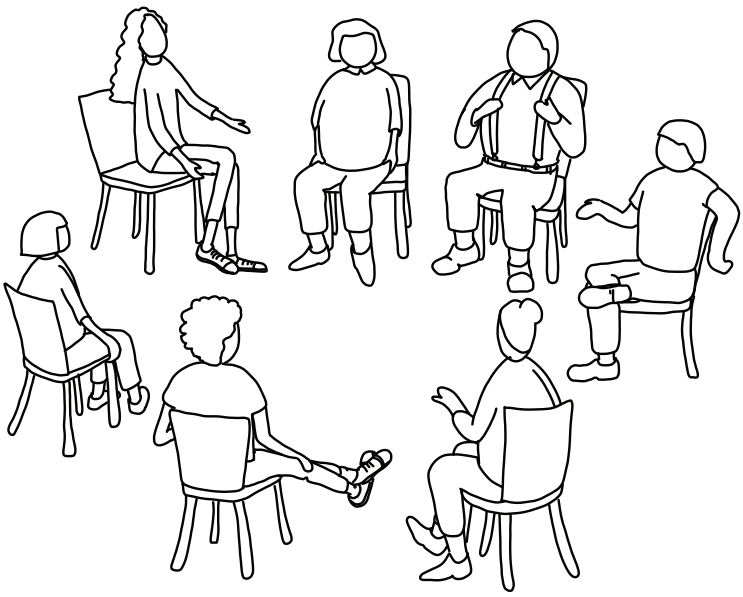
11. PAUSE AND REFLECT[6]

Level of effort: Low
Time required: 15 minutes to 1 hour
Skills required: Basic facilitation, a leader willing to lead by example

Effective team learning requires "turning the mirror inward; learning to unearth our internal pictures of the world, to bring them to the surface and hold them rigorously to scrutiny. It also includes the ability to carry on 'learningful' conversations...where people expose their own thinking effectively and make that thinking open to the influence of others." (Senge, 1990)

The effectiveness of actions we take to impact the world is often difficult to assess because of the complexity of the systems in which we work. Reflection is the process of critically examining beliefs and actions to create meaning and uncover new ideas. Taking the time to stop and think about our actions is a learning approach that is a deceptively simple but powerful way to generate and share useful knowledge to inform wiser future actions.

6 This tool was authored by Allison Catalano.



What is a Pause and Reflect?

Pause and Reflect is an informal or formal dialogue with team members and/or other stakeholders that seeks to examine beliefs, assumptions, decisions, or actions in a timely manner with the aims of adapting to new or changing information and improving future outcomes.

Learning does not take place just because we paused from our work to document a decision or an outcome. To be an effective team-learning tool, Pause and Reflect catalyzes an interpersonal, social process that involves investigation, sharing, and exploring areas of tension to surface and integrate differing perspectives, opinions, and insights (Catalano et al. 2019).

Why should we Pause and Reflect?

Our team will perform better.

The urgency felt by many working to create positive and sustainable change in the world often results in a bias toward action over reflection. But reflection is an essential component of improved performance, a fact recognized in the military, medicine, and business. Group reflection allows teams to integrate individually held information, create shared mental models, surface hidden assumptions, and counter the effects of cognitive biases that distort decision-making.

When should we Pause and Reflect?

Regularly. Even when things are going well.

Most commonly, Pause and Reflect is informal, routine, and low-risk. For example, it could simply be a rapid, purposeful, weekly team check-in to see what has gone well (and why), what has not (and why), and what needs to be adjusted going forward.

Regular reflection sessions, even when things are going well, build the mental muscle of reflection and foster psychological safety (the degree to which people feel it's okay to take interpersonal risks in a group – a prerequisite for effective team learning). Then, when more challenging situations arise, the team has already had plenty of practice asking questions, seeking feedback, and knowing where to turn for additional evidence or knowledge to support tough decisions. It's just like investing time in building relationships in a community so that if/when something goes wrong, you have people you feel you can call upon for help.

A Pause and Reflect could also take the form of a quarterly "pause and learn" session in which teams (perhaps even across organizational silos and inclusive of diverse actors in your system) gather for a morning to reflect on experiences and share learning.

Too often, the end of a project is marked either by a pro forma wrap-up or with no reflection process at all, and learning is not transferred explicitly into the next action cycle. A Pause and Reflect can be a formal event, such as an After Action Review (AAR) that occurs after a predetermined milestone or event (USAID, 2013). An AAR is designed to engage stakeholders in a structured process of identifying best practices and mistakes, so that lessons learned can be codified, disseminated, and fed back into the next action (the most important part of the cycle). This process may be aided by the presence of a trained facilitator.

Instructions

1. **Set the norm.** Start by scheduling brief (~15 minutes) recurring check-ins each week with your team. Do this today.
2. **Create the right mindset and banish fear, blame, and shame.** Remind people that the purpose of the conversation is learning how to do things better, not apportioning blame. Remove rank and organizational hierarchy. Approach the discussion with humility and curiosity, encouraging candid discussions and ensuring everyone's input is welcome.
3. **Lead by example**. Don't be afraid to ask for help or talk about things you could have done better. Be specific. For example, you could make an explicit statement like, "Jane, I wish that I had asked for your help last week before I sent that inaccurate information to our partners. I'm sure if we had talked about this together we would have come up with a better solution and I wouldn't have made that mistake. I'm sorry I've wasted time and irritated people. How can we put this learning to good use going forward?"
4. **Ask open-ended learning questions.** These could include:
    - What went well this week? Why?
    - What didn't go as well as we hoped? Why?
    - What have we learned?
    - What could we have done better?
    - Are there any things we should do differently going forward?
5. **Repeat.**

Curbing illegal wild meat trade and the importance of reflecting even on success

To reduce the illegal transportation of bushmeat from Conkouati-Douli National Park and surrounding logging concessions in the southwest of the Republic of Congo, the a conservation NGO and the government protected area's staff decided to erect a barrier along the main road to the large coastal city of Pointe-Noire. For the first few days, the staff confiscated bushmeat from almost every vehicle they stopped at the barrier.

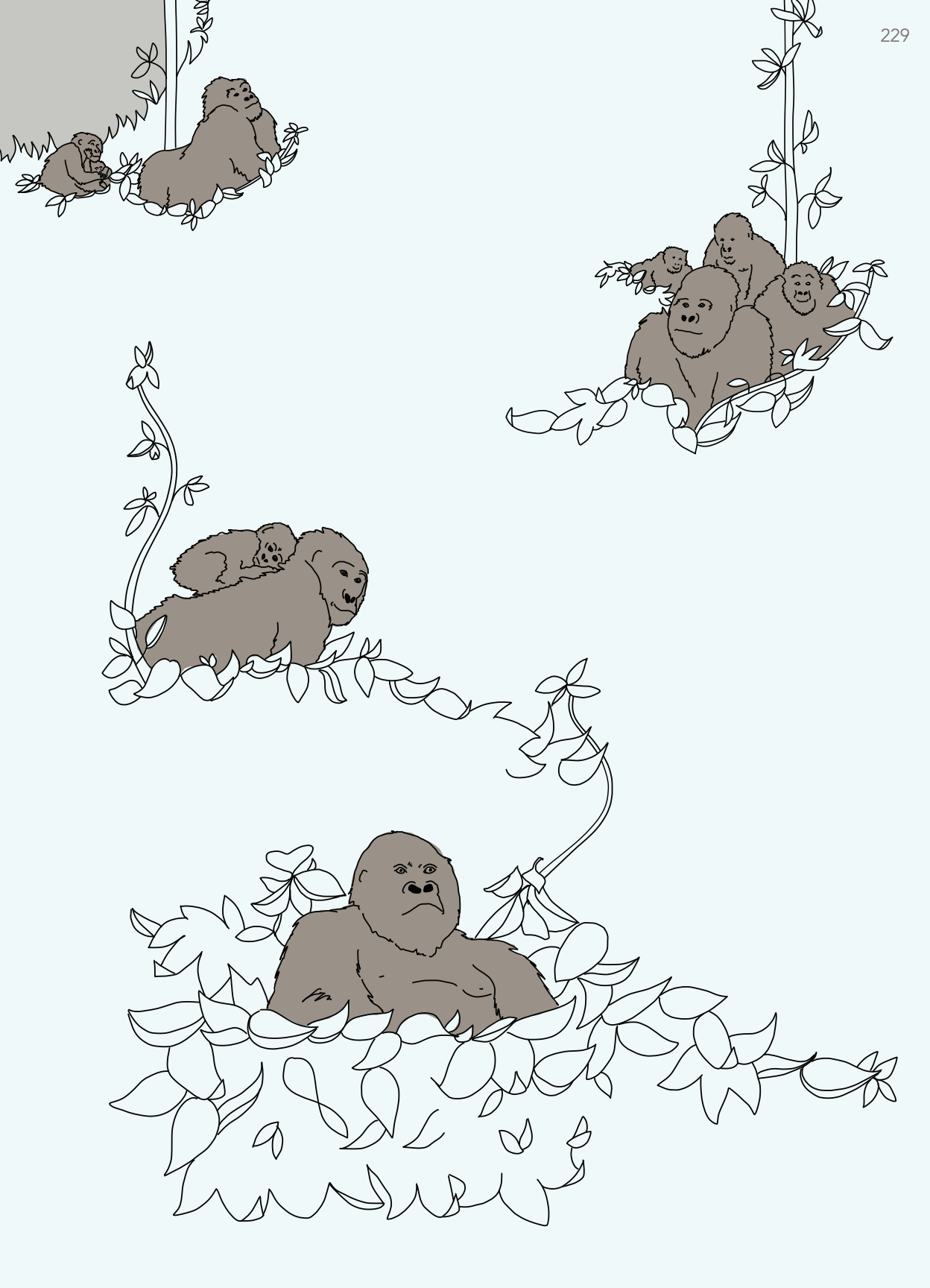
Over the next few weeks, the intervention appeared to be a dramatic success, with almost no bushmeat found in any vehicle stopped at the barrier. The team was elated. Their plan had worked! The barrier and confiscation of contraband appeared to be a strong disincentive for drivers to buy and transport bushmeat to the city.

Using a **Pause and Reflect** session, the team took time to reflect on this "success" instead of reporting it up to higher headquarters and moving on to another project. Their reflection led them to ask whether there could be any other explanation for the outcome they were witnessing.

They decided to dig a bit deeper and in talking to local bushmeat hunters they found out that the barrier was not actually effective in curbing the flow of illegal bushmeat. Drivers had simply discovered that they could stop well before the barrier and unload their bushmeat cargo to porters, who would then transport the goods around the barrier through the forest and reload after the trucks had cleared the inspection at the barrier.

Without reflecting on the apparent success of the barrier, the team may never have realized the perverse outcome of the intervention. As a result, the team shifted their strategy to using pop-up barriers, which were set up on random days at continually changing locations along the road.

For more on this case see Guadagno, et al., 2021.



GLOSSARY

agitators – members of a core team who like to shake things up and use their critical thinking skills to push those around them (and themselves) to "do better" and check their biases.

artifacts –potential outputs from a Systems Journey, such as systems maps, interview notes, and lists of potential actions.

causal loop diagram – a causal diagram that aids in visualizing how different variables in a system are interrelated. Consists of a set of nodes and relationships (shown as arrows between nodes). Nodes represent the variables (often stocks) and arrows between them represent the causal relationship between the two variables.

cognitive bias – the mental filters used naturally and often unconsciously to make sense of constant streams of information through simplification and association (Ariely, 2010).

core team – the group of allies and close companions with whom you work closely on a Systems Journey. The core team forms a unified, networked whole that shepherds a change process forward.

critical uncertainties – trends identified during Scenario Planning that could go one way or another leading to very different outcomes.

diagnostic questions – questions that can be used to uncover information on the past, present, and future of a system.

double-loop learning – learning that moves beyond single-loop learning and requires that individual values, beliefs, and assumptions are challenged when seeking to understand why or how change happened. Ideally, double-loop learning can contribute to deeper understanding and change at individual and organizational levels.

dynamic complexity –nonlinear change in a system over time.

entry point – common scenario within an organization that can easily be turned into a moment to begin a Systems Journey.

environmental scanning – a simple method of defining possible futures by intersecting two critical uncertainties.

feedback loop – created when elements in a system are interrelated to each other; where a change to any element (e.g., number of fish) leads to further change in that element (e.g., more fish). Feedback loops can be "reinforcing," leading to exponential growth or decay, or "balancing," where the system resists change and returns to the previous state. Most systems consist of multiple feedback loops, sometimes working counter to each other, keeping the system in equilibrium.

fishbowl – a facilitation technique that involves a dialogue between a subset of participants, who sit in the middle of the room ("the fishbowl"), while other participants listen and watch from the sides of the room, or "outside the fishbowl." Useful for managing power dynamics or to explore a particular subgroup's thoughts, hopes, and concerns about an issue or topic.

four modes – the four different ways of talking and listening.

guiding star – used to describe a goal or vision that you orient toward on your

journey. A guiding star is often not SMART (**S**pecific, **M**easurable, **A**ctionable, **R**ealistic, **T**ime-bound) and instead is broad and fuzzy. It's the "why" behind the work, and like a compass, it steers you and others toward the vision you're aiming for.

indicator – a quantitative or qualitative measure to help track change in a system's state or dynamics to guide sensing systems change.

innovator – a member of a core team that might have new, big ideas, have kicked off the whole process, or be the "keeper of the vision."

interest – the feeling of a person whose attention, concern, or curiosity is particularly engaged by something.

lagging indicator – an indicator that is slower to change; changes in lagging indicators are seen in the future based on actions that happen in the short term. Lagging indicators can help measure longer-term changes in a theory of change.

leading indicator – an indicator that is faster to change. These can be used to help measure progress against shorter-term outcomes of a theory of action, or as proxies for longer-term components of a theory of change.

learning journey – a type of Semi-structured Interview carried out on a visit to an interviewee's home, place of work, or area of interest.

learning mindset – an intent to learn, which shapes how receptive people are to new ideas and insights.

learning question – questions that help guide learning around specific aspects of a theory of change or action, designed to prompt creative thinking about the unknowns in a project and facilitate sensing change and learning your way forward.

leverage point – places in a system where a small shift can produce big changes in the entire system. We analyze for leverage to better understand where to focus our efforts to realize more structural and systemic change.

mediators – members of a core team who have a good intersection of general, topical knowledge, as well as the ability to run workshops, design conversations, and move processes forward.

mental models and paradigms – the fundamental underlying values and beliefs held by people in the system about how things work (or should work).

navigator – someone who cultivates and stewards a Systems Journey over a period of time. There may be one or many navigators on any journey.

orchestrators – members of a core team who look for the bigger picture and see connections everywhere. They know which people should be considered in the co-creation process and are one step ahead, smoothing the way for implementation.

orienting – used in reference to "orienting to the journey," which involves understanding the links between ourselves, our internal ways of being, what we assume about the world, and how we relate to others in the system. Orientation for a Systems Journey happens in four ways: orienting

internally, orienting to your surroundings, checking your conditions, and finding and cultivating your team.

outcome – a nearer-term or short-term goal used to inform the actions we take today that help realize the guiding star.

paired walk-and-talk – a type of Semi-structured Interview carried out between two people informally on a walk.

path dependency – the continued use of a product or practice based on historical preference or use.

Photovoice – an action research method that draws on participatory photography to give a "voice" to participants engaged in the exercise. Introduced as part of Visualizing Situations and Change.

polarity mapping – polarity thinking or mapping is a facilitation technique or way of thinking and working that harnesses the 'power of opposites'. It assumes that pairs of values that seem to be in opposition to each other are actually interdependent (CoCreate, 2020).

power – the realized ability to control, exert authority over, or influence others.

powerful questions – questions that are designed to generate curiosity in the listener, stimulate reflective conversation. They are thought-provoking and surface underlying assumptions.

power-versus-interest mapping – a Stakeholder Mapping exercise that explores power in human relationships and networks, and asks how power has impacted the world as we know it, as well as how we hope it will work in the future.

problem statement – a single sentence or statement that will guide you as you move along your Systems Journey. It answers the question, "Why are we all here?" and helps you understand the patterns of change, relationships, interconnections, and beliefs of your system.

process indicators – indicators that track progress on a journey to understand how different actors are working together to create change. Introduced as one of three domains that you may measure as you "sense systems change."

prototype – models or experiments, particularly used in Rapid Cycle Prototyping.

resilience – the capacity of a system to deal with change and continue to develop.

Rich Picture – a methodology in which individuals or groups explore, acknowledge, and define a situation through pictures. Introduced as part of Visualizing Situations and Change.

scenario waypoints – in Wind Tunneling, these indicators help you understand that one of the futures you've imagined is emerging.

sentence starters – prompts used to explore the four different ways of talking and listening.

silent conversations – a facilitation technique in which participants are asked to write short statements in response to a facilitator's probing question. These aim to

slow the pace of thinking and encourage deeper individual reflection and listening.

single-loop learning – when individuals, groups, or even institutions or organizations modify their actions based on the difference between expected and reached outcomes. Single-loop learning often misses the root causes of failure and does not involve challenging individual assumptions or beliefs about how the world works.

social network analysis – the process of investigating social structures through the use of networks and graph theory.

sphere of control – the things we can directly do something about.

sphere of influence – the things we can indirectly shape.

sphere of interest – the things that shape our systems but which we cannot control.

status-quo bias – the tendency to stick to a current course of action because it is harder to justify a change of course than the status quo and the fact that it is more effort to change.

stocks – elements of a system that change as a result of in- and out-flows. The behavior of any system can be seen in patterns of stocks over time.

sunk costs – a cost that has already been incurred and cannot be recovered.

system – a set of things, people, cells, molecules, or anything interconnected in such a way that they produce their own pattern of behavior over time (Meadows, 2008).

system archetypes – common patterns or system structures that exhibit common behavior over time.

system dynamics modeling – a computer-aided approach to policy analysis and design that combines both causal-loop diagrams and dynamic simulation models of stocks and flows (see *The Art of Systems Change*, p.19) to understand systems, solve problems, and test policies.

systems thinking – often defined as a way of understanding that recognizes the connections and complexity of the world (Meadows, 2008), systems thinking is a philosophy with multiple origins in Western thought. Systems thinking as defined in this guide encourages seeing the world from multiple perspectives, grappling with the dynamics of systems and the inherent trade-offs we face as we strive to create a better future with those who may see and experience the world differently.

teachers – members of a core team who actively encourage others around them to consider a new way of working and thinking. They often help with capacity development, offer inspiration and support, and provide advice.

theory of action – a theory (or hypothesis) of how our planned actions may propel our Theory of Change to achieve our desired outcome(s). Theories of action are more tangible, specific, and take into account our sphere of influence and control.

theory of change – theory (or hypothesis) of how and why systems change occurs, irrespective of any planned actions. Theories of change lay the pathway(s) for

how change is likely to unfold given our current understanding of the system and its past, present, and possible futures.

tools – any method or approach that can help you and others progress on your Systems Journey. This guide features 11 practical tools for creating systems change, but there are many more.

REFERENCES

Argyris, C. and Schön, D. A. (1978) *Organizational Learning*. London: Addison-Wesley.

Ariely, D. (2010) *Predictably Irrational: The Hidden Forces That Shape Our Decisions*. Revised and expanded edition. New York, N.Y.: Harper Perennial.

Baldwin and Chandler. (2010) *At the water's edge: community voices on climate change.* Local Environment. 15, pp.637–649.

Battilana, J. and Kimsey, M. (2017) 'Should You Agitate, Innovate, or Orchestrate?' *Stanford Social Innovation Review*. Available at: https://ssir.org/articles/entry/should_you_agitate_innovate_or_orchestrate (Accessed: 3 January 2022).

Beckhard, R. and Harris, R.T. (1987) *Organizational Transitions: Managing Complex Change*. 2nd edn. Reading, Mass.: Addison-Wesley.

BetterEvaluation.org. Rich Picture (mind map). Available at: https://www.betterevaluation.org/en/evaluation-options/richpictures (Accessed 30 April 2021).

Candy, S. (2010) *The Futures of Everyday Life: Politics and the Design of Experiential Scenarios*. Ph.D dissertation in Political Science, University of Hawai'i at Mānoa.

Candy, S. and Kornet, K. (2019) 'Turning Foresight Inside Out: An Introduction to Ethnographic Experiential Futures', *Journal of Futures Studies* 23(3), pp.3–22.

Catalano, A.S., Lyons-White, J., Mills, M.M., Knight, A.T. (2019) 'Learning from published project failures in conservation,' *Biological Conservation* 238, 108223.

Checkland, P. (2000) 'Soft Systems Methodology: A Thirty Year Retrospective' Research Paper. Syst. Res. 17, S11.

Child, B. (1996) 'The practice and principles of community-based wildlife management in Zimbabwe: the CAMPFIRE programme', *Biodiversity & Conservation* 5, pp.369-398.

Choo, C.W. (1999) 'The Art of Scanning the Environment', *Bulletin of the American Society for Information Science and Technology* 25, pp.21–24.

CoCreative. (2020) Hands on Polarity Thinking: Leveraging Difference for Innovation.

Dhillon, L. and Vaca, S. (2018) 'Refining Theories of Change', *Journal of Multi-Disciplinary Evaluation* 14(30), pp.64–87.

Enfors-Kautsky, E., Järnberg, L., Quinlan, A. and Ryan, P. (2021) 'Wayfinder: a new generation of resilience practice', *Ecology and Society* 26(2).

Edmondson, A. C. (2012) *Teaming: How Organizations Learn, Innovate, and Compete in the Knowledge Economy*. San Francisco, Calif.: Jossey-Bass.

Edmondson, A. C. (2019) *The Fearless Organization: Creating Psychological Safety in the Workplace for Learning, Innovation, and Growth*. Hoboken, N.J.: Wiley & Sons.

Fishman, G. S. (2013) *Discrete-Event Simulation: Modelling, Programming, and Analysis*. New York, N.Y.: Springer Science & Business Media.

Folke, C., Hahn, T., Olsson, P. and Norberg, J. (2005) 'Adaptive Governance of Social-Ecological Systems', *Annual Review of Environment and Resources* 30(1), pp.441–73.

Ford, A. and Ford, F. A. (1999) *Modelling the Environment: An Introduction to System Dynamics Models of Environmental Systems*. Washington D.C.: Island Press.

Garvin, D. A., Edmondson, A. C. and Gino, F. (2008) 'Is Yours a Learning Organization?' *Harvard Business Review*. Available at: https://hbr.org/2008/03/is-yours-a-learning-organization (Accessed: 3 January 2022).

Geels, F. W. (2011) 'The Multi-Level Perspective on Sustainability Transitions: Responses to Seven Criticisms', *Environmental Innovation and Societal Transitions* 1(1), pp.24–40.

Goodchild, M. (2021) 'Relational Systems Thinking: That's How Change Is Going to Come, From Our Earth Mother', *Journal of Awareness Based Systems Change* 1(1), pp.75–103.

Goodman, M. (2002). *The Iceberg Mode*l. Hopkinton, Mass.: Innovation Associates Organizational Learning.

Guadagno, L., Vecchiarelli, B. M., Wilkie, D., and Kretser, H. E. (2021). 'Reflection and learning from failure in conservation organizations', Wildlife Conservation Society, Working Paper no.48.

IRDNC. (No date) 'Integrated Rural Development and Nature Conservation'. Available at: http://www.irdnc.org.na/history.html (Accessed: 18 October 2021).

Jones, B. and Weaver, L. C. (2008) CBNRM in Namibia: Growth, Trends, Lessons and Constraints, in Suich, H. and Child, B. (eds) *Evolution and Innovation in Wildlife Conservation*, London: Routledge, pp.241–60.

Kahane, A. (2004) *Solving Tough Problems: An Open Way of Talking, Listening, and Creating New Realities*. San Francisco, Calif.: Berrett-Koehler.

Kim, D. (1995) 'Pocket Guide: Guidelines for Drawing Causal Loop Diagrams', The Systems Thinker. Available at: https://thesystemsthinker.com/pocket-guide-guidelines-for-drawing-causal-loop-diagrams (Accessed: 6 January 2022).

Kim, D. and Lannon, C. (No date) 'A Pocket Guide to Using the Archetypes', The Systems Thinker. Available at: https://thesystemsthinker.com/a-pocket-guide-to-using-the-archetypes (Accessed: 18 October 2021).

Kim, D. H. (1994) *Systems Archetypes*. Cambridge, Mass.: Pegasus Communications.

Kim, D. H. and Anderson, V. (1998) *Systems Archetype Basics: From Story to Structure*. Waltham, Mass.: Pegasus Communications, Inc.

Kornet, K. (2015) 'Causing An Effect: Activists, Uncertainty & Images of the Future', OCAD University. Available at: http://openresearch.ocadu.ca/id/eprint/257 (Accessed: 3 January 2022).

Kristiansen, P. and Rasmussen, R. (2014) *Building a Better Business Using the Lego Serious Play Method*. Hoboken, N.J.: Wiley & Sons.

Lovallo, D. and Sibony, O. (2010) 'A Language to Discuss Biases', *McKinsey Quarterly* 2(1), pp.30–43.

Mahajan S.L. and Daw T. (2016) 'Perceptions of ecosystem services and benefits to human well-being from community-based marine protected areas in Kenya.' *Marine Policy* 74, pp.108–19.

Masterson, V. A., Mahajan, S.L., and Tengö, M. (2018) 'Photovoice for mobilizing insights on human well-being in complex social-ecological systems: case studies from Kenya and South Africa.' *Ecology and Society* 23(3), p.13.

Meadows, D. (1999) *Leverage Points: Places to Intervene in a System*. Hartland, Vt.: The Sustainability Institute.

Meadows, D. (2008). *Thinking in Systems: A Primer*. White River Junction, Vt.: Earthscan.

Merrie, A., Keys, P., Metian, M., and Österblom, H. (2018) 'Radical ocean futures-scenario development using science fiction prototyping', *Futures* 95, pp.22–32.

Moberg, F. and Simonsen, S.H. (2015) 'What Is Resilience? An Introduction to Social-Ecological Research', Stockholm Resilience Centre. Available at: https://stockholmresilience.org/download/18.10119fc11455d-3c557d6d21/1459560242299/SU_SRC_whatis-resilience_sidaApril2014.pdf (Accessed: 3 January 2022).

Muñoz-Erickson, T. A. (2014) 'Co-production of knowledge-action systems in urban sustainable governance: The KASA approach', *Environmental Science & Policy* 37 Supplement C, pp.182–191.

Murphy, R. and Jones, P. (2020) 'Leverage Analysis: A Method for Locating Points of Influence in Systemic Design Decisions', FormAkademisk,13(2), pp.1–25.

Norström, A. V., et al. (2020) 'Principles for Knowledge Co-Production in Sustainability Research', *Nature Sustainability* 3(3), pp.182–90.

Odken, J. (2014) 'If a picture paints a thousand words: The use of rich pictures in evaluation.' Available at: https://www.pragmatica.nz/site_files/27638/upload_files/Ifapicturepaintsathousandwords_Theuseofrichpicturesinevaluation_Presentation.pdf?dl=1 (Accessed: 3 January 2022).

Ostrom, E. (2009) 'A General Framework for Analyzing Sustainability of Social-Ecological Systems', *Science* 325, pp.419–22.

Ota, L., et al. (2021) 'Using Leading and Lagging Indicators for Forest Restoration', *Journal of Applied Ecology* 58(9), pp.1806–12.

Palibroda, B., Krieg, B., Murdock, L., and Havelock, J. (2009) 'A practical guide to Photovoice: Sharing pictures, telling stories, and changing communities'. Available at: http://www.pwhce.ca/photovoice/pdf/Photovoice_Manual.pdf (Accessed: 6 January 2022).

Parkhurst, M. and Preskill, H. (2014) 'Learning in Action: Evaluating Collective Impact', *Stanford Social Innovation Review*. Available at: https://ssir.org/articles/entry/evaluating_collective_impact# (Accessed: 3 January 2022).

Patton, M.Q. (2010) *Developmental Evaluation: Applying Complexity Concepts to Enhance Innovation and Use.* 1st edn. New York, N.Y.:The Guilford Press.

Patton, M.Q. (2020) *Blue Marble Evaluation: Premises and Principles*. New York, N.Y.: The Guilford Press.

Pereira, L. (2020) 'Preferences and pathways: strengthening futures capacity in Africa', Luc Hoffmann Institute. Available at: https://luchoffmanninstitute.org/strengthening-futures-capacity-in-africa-a-new-african-ecological-futures-report (Accessed: 6 January 2022).

Peters, D. H. (2014) 'The application of systems thinking in health: why use systems thinking?' *Health Research Policy and Systems* 12, p.51.

PMBOK (2014) 'Navigating Complexity: A Practice Guide.' Available at: https://www.pmi.org/pmbok-guide-standards/practice-guides/complexity (Accessed: 6 January 2022).

Railsback, S.F. and Grimm, R. (2019) *Agent-Based and Individual-Based Modeling: A Practical Introduction*. Princeton, N.J.: Princeton University Press.

Ramirez, R. and Wilkinson, A. (2016) *Strategic Reframing: The Oxford Scenario Planning Approach*. New York, N.Y.: Oxford University Press.

Rare and The Behavioural Insights Team. (2019) *Behavior Change For Nature: A Behavioral Science Toolkit for Practitioners*. Arlington, Va.: Rare.

Reid, A. J., et al. (2021) 'Two-Eyed Seeing: An Indigenous Framework to Transform Fisheries Research and Management', *Fish and Fisheries* 22(2), pp.243–61.

Rhydderch, A. (2017) 'Scenario Building: The 2x2 Matrix Technique', *Perspectives and Strategic Foresight Toolbox*, Futuribles International.

Robinson, S. (2005) 'Discrete-Event Simulation: From the Pioneers to the Present, What Next?' *Journal of the Operational Research Society* 56(6), pp.619–29.

Scharmer, O. (2007) *Theory U: Leading from the Future as It Emerges*. Oakland, Calif.: Berrett-Koehler Publishers, Inc.

Scheffer, M., Bascompte, J. , Bjordam, T. K., Carpenter, S. R., Clarke, L. B., Folke, C., Marquet, P., Mazzeo, N., Meerhoff, M., Sala, O., and Westley, F. R. (2015) 'Dual thinking for scientists', *Ecology and Society* 20(2), p.3.

Schwerdtner Máñez, K., et al. (2020) *Save Nature Please: A Behavior Change Framework for Conservation*. WWF International. Available at: https://wwf.panda.org/wwf_news/?1036441/Using-behavioural-science-for-conservation (Accessed: 3 January 2022).

Senge, P. (1990) *The Fifth Discipline: The Art and Practice of the Learning Organization*. New York, N.Y.: Doubleday/Currency.

Sharpe, B. (2013) *Three Horizons*. Axminster, United Kingdom: Triarchy Press.

Sharpe, B., Hodgson, A., Leicester, G., Lyon, A., and Fazey, I. (2016) 'Three horizons: a pathways practice for transformation', *Ecology and Society*. 21(2), p.47.

Sterman, J. (2000) *Business Dynamics: Systems thinking and modeling for a complex world*. McGraw-Hill Education.

Stroh, D. P. (2015) *Systems Thinking for Social Change: A Practical Guide to Solving Complex Problems, Avoiding Unintended Consequences, and Achieving Lasting Results*. White River Junction, Vt.: Chelsea Green Publishing.

Tanner, L., et al. (2020) 'Making Better Decisions: how to use evidence in a complex world', The Research People and the Alliance for Conservation Evidence and Sustainability 29. Available at: https://static1.squarespace.com/static/5b042617f2e6b128dcd45a3d/t/5f343b492e0d155061f2222f/1597258606817/Making_better_decisions_ACES.pdf (Accessed: 3 January 2022).

Tanner, L., Mahajan, S., Becker, H., Demirdjian, T., DeMello, N., Mills, M., Masuda, Y., Wilkie, D. and L. Glew, (2020b) 'Knowledge Brief: Decision-making biases', The Research People and the Alliance for Conservation Evidence and Sustainability. Available at: https://www.allianceconservationevidence.org/s/ACES-Briefing-Biases.pdf (Accessed: 4 January 2022).

Tengö, M., Hill, R., Malmer, P., Raymond, C. M., Spierenburg, M., Danielsen, F., Elmqvist, T., Folke, C. (2017) 'Weaving knowledge systems in IPBES, CBD and beyond—lessons learned for sustainability', *Current Opinion in Environmental Sustainability*, 26–27, pp.17–25.

The Omidyar Group. (2017) *Systems Practice*. Available at: https://docs.kumu.io/content/Workbook-012617.pdf (Accessed: 18 October 2021).

USAID. (2013) *After-Action Review Guidance*. Available at: https://usaidlearninglab.org/sites/default/files/resource/files/afteractionreviewguidancemarch2013.pdf (Accessed 18 October 2021).

USAID LEARN. (2018) 'Learning Questions Checklist', USAID Learning Lab. Available at: https://usaidlearninglab.org/library/learning-questions-checklist (Accessed: 12 August 2021).

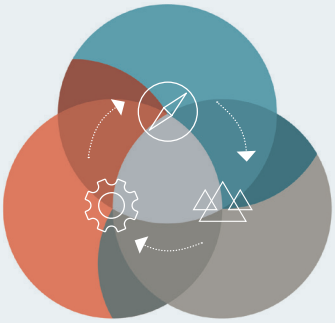
USAID. Matts, M. and Hinthorne, L. (2020) 'Learning Questions Tip Sheet', USAID Learning Lab. Available at: https://usaidlearninglab.org/library/learning-questions-tip-sheet (Accessed: 12 August 2021).

Van Der Heijden, K. (1997) 'Scenarios, strategies and the strategy process'. Available at: http://citeseerx.ist.psu.edu/viewdoc/versions?doi=10.1.1.202.9185

Wang and Burris, 1997. *Photovoice: Concept, methodology, and use for participatory needs assessment.* Health Edu. & Behavior. 24, pp.369–387

Wilensky, U. and Rand, W. (2015) *An Introduction to Agent-Based Modeling: Modeling Natural, Social, and Engineered Complex Systems with NetLogo*. Cambridge, Mass.: MIT Press.

Wyborn, C., et al. (2020) 'Imagining Transformative Biodiversity Futures', *Nature Sustainability* 3(9), pp.670–72.



We are all connected and cannot keep working in silos. The solutions we design to tackle society's most pressing problems need to work together to ensure people and nature can thrive in a changing world.

The Craft of Systems Change introduces a way of thinking and working called the Systems Journey, which knits together the many ideas, tools, and ways of being in the world that are often traced back to systems thinking and systems change. The Systems Journey encourages readers to engage meaningfully with the systems and the people around us, explore the many different futures we may aspire towards, and learn our way towards a future that works for everyone. Through the use of practical facilitation tools, readers are invited to look within to deeply engage with what may be preventing change, embrace a learning mindset that can help surface new leverage points in the systems where we work, and adapt our actions to ensure they create the change that we need for a better future.

While the book was written for those working to advance nature conservation goals, it is truly for anyone who wishes to take steps towards changing themselves and the systems we all live and work in. This book takes systems thinking out of theory and into practice and encourages a way of living and working in the world that is inclusive, holistic, and impactful every step of the way.

WWF