"An elegant and cogent guide to what works."
—PETER SENGE, author of *The Fifth Discipline*

# SYSTEMS THINKING for SOCIAL CHANGE

**A Practical Guide to Solving Complex Problems, Avoiding Unintended Consequences, and Achieving Lasting Results**

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# INTRODUCTION

Whether you are committed to ending homelessness, strengthening education, improving public health, reducing the problems of poverty, developing environmental sustainability, or helping people live better lives in other ways, you might have noticed that the organizations and systems you want to change have a life of their own. In other words, you do things to try to improve them and they essentially continue to operate as if your input makes no difference.

*Organizations and social systems do in fact have a life of their own.*

As someone committed to achieving sustainable, breakthrough social change, it helps to understand these forces so that you can consciously work *with* them instead of unconsciously working against them. You might be working in a foundation or nonprofit, government agency or legislature, department of corporate social responsibility, or as a consultant to people in these roles. In an era when growing income inequality and climate change increase the vulnerability of many and reduce the sustainability of all, you might feel called to do more to heal the world. You might also be challenged to achieve more with less—less time, attention, and money than you had before.

The book is based on a simple premise: *Applying systems thinking principles and tools enables you to achieve better results with fewer resources in more lasting ways*. Systems thinking works because it:

- Increases your awareness of how you might unwittingly be contributing to the very problems you want to solve.
- Empowers you to begin from where you can have the greatest impact on others, by reflecting on and shifting your *own* intentions, thinking, and actions.
- Mobilizes diverse stakeholders to take actions that increase the effectiveness of the whole system over time instead of meeting their immediate self-interests.

- Helps you and others anticipate and avoid the negative longer-term consequences of well-intentioned solutions.
- Identifies high-leverage interventions that focus limited resources for maximum, lasting, systemwide improvement.
- Motivates and supports continuous learning.

More specifically, if you are the director or program officer in a foundation, learning to think systemically will help you be more effective in your roles as convener, grant maker, and educator/advocate. You will become a better convener by:

- Enabling diverse stakeholders to see the big picture.
- Catalyzing conversations of accountability among stakeholders so that each becomes aware of how they unwittingly contribute to the very problem they want to solve.
- Mobilizing people to optimize the whole system instead of just their part of it.

You can increase your effectiveness as a funder by using systems thinking to:

- Uncover root causes of chronic, complex problems.
- Identify high-leverage interventions.
- Strengthen your commitment to invest for the long term and your ability to evaluate impact over time.

You can become a more effective educator and advocate by using systems thinking to:

- Inform policy makers and the public about the short- versus long-term consequences of proposed solutions.
- Reduce people's addictions to quick fixes that are likely to only make matters worse in the long run.
- Champion early small successes that also support people's higher and longer-term aspirations.

If you are a nonprofit or government agency that depends on outside funding, you can use systems thinking to:

- Deepen your understanding of the problems you want to solve.
- Engage people in the communities you serve more effectively.

- Distill your insights into visual systems maps that "are worth a thousand words."
- Identify strategic interventions that best leverage limited resources.
- Write more powerful grant requests that incorporate all of the above.

As a legislator or policy maker, you can use systems thinking to:

- Think more clearly about why social problems persist despite your best efforts to solve them.
- Anticipate and avoid long-term negative unintended consequences of proposed solutions.
- Identify high-leverage interventions that make the most of public tax dollars.
- Powerfully communicate the benefits of proposed legislation and policy to your constituents based on all of the above.

You can use systems thinking as a corporate social responsibility manager to develop more effective partnerships with key external stakeholder groups in both the nonprofit and public sectors. It can help you:

- See the big picture more clearly.
- Uncover and own the unintended negative consequences of your own actions.
- Work with external stakeholders to develop solutions that are more likely to benefit all parties over time.

If you are a professional in the systems thinking community who is committed to social change, you can learn how to integrate the tools of systems thinking into a proven change management process.

If you are an organizational or community development consultant, you can use systems thinking to increase people's motivations to change, facilitate collaboration across diverse stakeholders, identify high-leverage interventions, and inspire a commitment to continuous learning.

## What You Will Learn

*Systems Thinking for Social Change* helps you achieve these benefits by understanding what systems thinking is and how it can empower your work. It will also help you appreciate the basic principles and tools of

systems thinking, and learn how to apply it to problem solving, decision making, and strategic planning *without* becoming a technical expert.

More specifically, you will learn to:

**Use systems thinking instead of more conventional linear thinking to address chronic, complex social problems.** Einstein observed, "The significant problems we face cannot be solved with the same level of thinking we were at when we created them." Systems thinking is more appropriate than conventional thinking to solve chronic, complex social problems. By contrast, you can unwittingly perpetuate such problems by thinking conventionally about how to solve them.

**Apply systems thinking as both a set of principles and a particular group of analytic tools.** The tools in *Systems Thinking for Social Change*—which include the iceberg, the causal loop diagramming and systems archetypes popularized by Peter Senge, and the Bathtub Analogy—have proven highly effective in shifting how people address social problems.[1] While many other analytic tools exist,[2] this book demonstrates why these specific tools are especially helpful in enabling a diverse group of stakeholders to, in the words of executive consultant Ram Charan, "cut through complexity to the heart of the matter, without being superficial."[3]

**Integrate systems thinking into a proven four-stage change management process.** There are many change processes that seek to align diverse stakeholders without helping people understand how their thinking and subsequent behavior unintentionally undermines their own performance, the performance of others in the system, and the system's effectiveness as a whole. In other words, they often establish common ground around a shared aspiration yet fail to help people develop a joint understanding of not only what has been happening but also *why*. In searching for root causes, people typically assume that they are doing the best they can and that someone else is to blame—instead of recognizing, in the words of leadership expert Bill Torbert, that "if you are not aware of how you are part of the problem, you can't be part of the solution." By contrast, systems thinking enables people to identify high-leverage interventions based on deep insights into root causes that incorporate their own thinking and behavior.

This book reveals a four-stage change management process, grounded in systems thinking, that my longtime colleague Michael Goodman of Innovation Associates Organizational Learning and I have been working with for more than fifteen years. It also discusses how you can build systems thinking into other change processes. Many new processes have emerged in recent years to engage diverse stakeholders as a way of managing complexity and sharing resources.[4] From a systems thinking perspective, *the key is to help participants cultivate a deep awareness of current reality as something they have created instead of as something that exists outside of and independent of them*.

**Catalyze an explicit choice between the purpose people say they want to accomplish and the benefits they are achieving right now.** Systems are perfectly designed to achieve the results they are currently achieving.[5] In other words, no matter how dysfunctional a system appears to be, it is producing benefits for the people who participate in it. A pivotal intervention you will learn in this change process is to help people compare the benefits of change with the benefits of the status quo—and then help them make a conscious choice between the payoffs they are now getting and the espoused purpose they say they want the system to accomplish. This involves deepening people's connections with what they care about most and supporting them to let go of current payoffs that do not serve their highest aspirations.

**Apply systems thinking prospectively as well as retrospectively.** The book highlights the application of systems thinking *retrospectively* to help people develop better solutions to chronic, complex social problems by first deepening their understanding of why they have been unsuccessful so far despite their best efforts. Emphasizing the retrospective application of systems thinking is so important because people tend to create more problems by failing to first fully appreciate the problem they are trying to solve.

At the same time, the book also shows you how to use the tools *prospectively* for strategic planning and assessment. You will learn to integrate leverage points into a systemic theory of change, design new systems where there is no precedent, organize your priorities, and establish an evaluation method grounded in systems principles.

**Cultivate systems thinking as a way of being—not just as a way of thinking.** Because systems thinking challenges people to take more responsibility for their actions and make hard choices, it is framed in this book as *more* than a way of *thinking*. The book describes how the approach affects people not only cognitively but also emotionally, spiritually, and behaviorally. As you build your capacity to think systemically, you will discover that the tools both enable and require you to develop a new way of *being*, not just *doing*—a set of character traits to cultivate (such as curiosity, compassion, and courage) that complement and deepen your new skills.

The concepts will be tied closely to experiences my colleagues and I have had in applying systems thinking to social change initiatives. Some of the stories you will read about address:

- Aligning a community of a hundred thousand people around a ten-year plan to end homelessness.
- Designing a more effective statewide early-childhood development and education system.
- Improving the quality of environmental public health in states, counties, and cities around the United States.
- Reforming the criminal justice system with particular attention to reducing recidivism among people recently released from prison.
- Improving relationships between two agencies responsible for improving K–12 education in their state.
- Increasing people's fitness and consumption of healthy local food in a rural region.

## Structure of the Book

The book is organized into three parts. Part 1 introduces systems thinking within the context of social change and includes four chapters. Chapter 1 explains why people's best intentions to solve chronic social problems often fail to deliver expected results, defines *system* and *systems thinking*, and distinguishes systems thinking from conventional thinking. Chapter 2 explains why systems thinking is effective in meeting four challenges of managing change, identifies six indicators that help you determine when

applying systems thinking is likely to be most useful, and describes in particular how it can contribute to the pioneering cross-sector coordination process known as Collective Impact.

Chapter 3 introduces the metaphor of systems thinking as storytelling. It distinguishes two types of stories: a more common one that tends to perpetuate the status quo, and a systemic one that stimulates productive change. This chapter also explains the power of language to create stories and summarizes the basic elements for formulating a systems story. Chapter 4 deepens this metaphor by illuminating basic story lines and richer systemic patterns or plots that underlie a diverse set of social issues. If you are already familiar with systems thinking, you might want to pay particular attention to the ways in which systems thinking mobilizes change (chapter 2) and skim the next two chapters for their many social and environmental examples.

Part 2 describes the four-stage change process. Chapter 5 introduces this four-stage process as:

1. Building a foundation for change.
2. Seeing current reality more clearly.
3. Making an explicit choice about what is most important.
4. Bridging the gap between people's aspirations and current state.

Chapter 6 describes how to build a foundation for change by identifying and engaging key stakeholders, establishing common ground, and developing collaborative capacity. It addresses such challenges as working with stakeholders who are motivated by immediate self-interests as well as higher aspirations, focusing their efforts around what can seem like a boundless challenge, and building relational skills that enable people to become responsible participants in a complex world.

Chapter 7 explains how stakeholders can take a deep dive into current reality early in the change process—and also why this step is critical. Often, people begin a social change process with similar aspirations for the outcome but have very different perceptions of what the real difficulty is and what should be done to solve it. They don't appreciate how their own intentions, beliefs, and behavior affect the performance of others as well as their own. Failing to see the big picture, they are more likely to propose familiar solutions that risk perpetuating the very problem they have been trying to solve. In other cases, people might feel overwhelmed by the complexity of

the big picture and question if they can do anything differently. The chapter helps readers assess current reality by recommending how to gather and organize information for a systems analysis; presenting the results of systems analyses from several social change initiatives; and showing how to create systems analyses that are comprehensive enough to cover many critical factors and viewpoints, yet simple enough to communicate and act upon.

Chapter 8 addresses how to build support for the outcome of a systems analysis. Helping stakeholders accept new insights about the system warrants a separate chapter because the language of systems thinking is often unfamiliar and the message of shifting from blame to responsibility can be difficult to embrace. The chapter describes three ways to meet these challenges: engaging people to develop their own analysis as much as possible; surfacing the mental models that influence how people behave; and creating catalytic conversations that stimulate awareness, acceptance, and alternatives.

Chapter 9 guides stakeholders to make an informed and explicit choice about the purpose they *want* the system to accomplish. Since a system is always designed to achieve *something*, no matter how dysfunctional it seems, a pivotal intervention is to help people distinguish, and where necessary choose, between what the system is accomplishing right now and what they aspire to accomplish. The chapter provides a way to help people compare the case for change (in line with what they deeply want) with the case for the status quo (the often hidden benefits people get from participating in the system as it behaves now). Because there are usually trade-offs between current benefits and people's higher aspirations, the process supports stakeholders to make an explicit choice based on what they care about most deeply, feel most drawn to achieve, and are willing to let go of to achieve what is even more important to them. At this point shared visioning takes on more meaning, since people also acknowledge the sacrifices that realizing the vision entails. They become more willing to optimize the whole system instead of continuing to optimize just their part.

Chapter 10 helps people bridge the gap between current reality and their consciously chosen direction. It involves identifying leverage points and establishing a process of continuous learning and outreach. The chapter describes four generic leverage points: increasing people's awareness of their often non-obvious interdependencies; "rewiring" key cause–effect relationships; shifting underlying beliefs and assumptions; and aligning the

chosen purpose with updated goals, metrics, incentives, authority structures, and funding streams. It also shows how to extend the process begun in the previous four stages through learning from experience, expanding the resource pool, and scaling up what works.

Part 3 describes three ways you can use systems thinking to shape the future. Chapter 11 addresses how to apply systems thinking to strategic planning. It explains the advantages of systemic over linear theories of change; introduces two core systemic theories of change; and shows how these theories can be used integrate leverage points, critical success factors, and disparate priorities to develop coherent and navigable strategies over time. Chapter 12 answers the question frequently posed by private and public funders about how systems thinking can contribute to evaluation. The chapter provides broad guidelines for conducting systemic evaluations and specific recommendations for validating explicit systemic theories of change.

Finally, chapter 13 provides guidelines for developing your ability as a systems thinker over time. It offers three ways forward: cultivating an orientation that integrates the cognitive, emotional, behavioral, and spiritual dimensions of the systems approach; learning by doing; and asking systemic questions.

In summary, the book provides you with many ways to think and act more productively, using methods that have been tested over decades with clients facing a wide range of seemingly intractable social problems. The tactics in the pages ahead can help even highly skilled change makers get closer to their goals and develop some crucial lifelong problem-solving traits.

For several years, I taught in a national program that introduced systems thinking approaches to fellows in the Centers for Disease Control's Environmental Public Health Leadership Institute. A report conducted on the program indicated that fellows learned to:

- Think through difficult issues.
- Understand what they do not know and how to learn it.
- Ask great questions.
- Engage others more effectively by seeing reality from their perspective.
- Apply a problem-solving approach that is both flexible and concrete.

- See a bigger picture that clarifies connections among many factors and identifies root causes of complex problems.
- Focus on what is most important.
- Work toward deep systems change by transforming the underlying assumptions and policies that govern existing processes and procedures.

These results represent the promise of systems thinking for social change and the opportunities available to you as you read on.

PART ONE

# SYSTEMS THINKING FOR SOCIAL CHANGE

—CHAPTER 1—

# Why Good Intentions Are Not Enough

Consider the following headlines, which are all based on true stories:

Homeless Shelters Perpetuate Homelessness
Drug Busts Increase Drug-Related Crime
Food Aid Increases Starvation
"Get-Tough" Prison Sentences Fail to Reduce the Fear of Violent Crime
Job Training Programs Increase Unemployment

What is going on here? Why do seemingly well-intentioned policies produce the opposite of what they are supposed to accomplish?

If you look closely at these solutions and many other stories of failed social policies, they have similar characteristics. They:

- Address symptoms rather than underlying problems.
- Seem obvious and often succeed in the short run.
- Achieve short-term gains that are undermined by longer-term impacts.
- Produce negative consequences that are unintentional.
- Lead us to assume that we are not responsible for the problem's recurrence.

For example, get-tough prison sentences do not address the socioeconomic causes of most inner-city crime. Although the perpetrators go to prison and pose less of an immediate threat, 95 percent of them are eventually released back into society—hardened by their experience and

ill prepared to reenter their communities productively. Nearly half of those released from prison are imprisoned again within the first three years for committing a repeat offense.[1] Moreover, the current system further weakens the infrastructure of these communities because it incarcerates fathers and mothers who can no longer bring up their children—thereby creating more instability and increasing the likelihood of producing a new generation of people who commit crimes. The system also redirects valuable public funds away from the socioeconomic and criminal justice reforms that could reduce crime permanently. Finally, if a formerly incarcerated person commits another crime, he or she is sent back to prison without considering how get-tough policies might have contributed to the recidivism.

Lewis Thomas, the award-winning medical essayist, observed, "When you are confronted by any complex social system . . . with things about it that you're dissatisfied with and anxious to fix, you cannot just step in and set about fixing with much hope of helping. This is one of the sore discouragements of our time."[2] He went on to say, "If you want to fix something you are first obliged to understand . . . the whole system."

## Distinguishing Conventional from Systems Thinking

What does it mean to understand the whole system? First, it means appreciating a situation you want to change through a systemic instead of a conventional lens. If you think that a systems lens is too sophisticated and beyond most people's reach, let me assure you that it is child's play.

If you are a parent, remember when your children were young, and you picked up after them. Your children would let their clothes pile up on the floor and move on to something more interesting. Eventually, after numerous failed attempts to have them put their clothes in the laundry, you would give up and put them there yourself. When your children would come back, the clothes had disappeared—as if by magic. "That worked!" they concluded. Nonlinear cause and effect, time delay, success (from their point of view, not necessarily yours)—these are all signs of a highly competent systems thinker.

Conventional or linear thinking works for simple problems, such as when I cut my hand and put on a Band-Aid to help the cut heal. It is also the basis for how most of us were taught in school and still tend to think—divide the world into specific disciplines and problems into their

components under the assumption that we can best address the whole by focusing on and optimizing the parts.

However, conventional thinking is not suited to address the complex, chronic social and environmental problems you want to solve. These problems require systems thinking, which differs from conventional thinking in several important ways, as table 1.1 shows.

For example, if the problem is homelessness, then the solution is not simply providing shelter. Providing temporary shelter is insufficient since people tend to cycle through shelters, the street, emergency rooms, and jails. Moreover, it is too easy to conclude that when people remain homeless, they do not want their own place to live, when in fact many want the security that comes with permanent housing. In addition, funding shelters tends to undermine both the political will and financial resources required to end homelessness.

Ending homelessness requires a complex, long-term response involving affordable permanent housing, support services for the chronically homeless, and economic development. This means establishing new relationships among the various providers who prevent homelessness, those who help people cope with being homeless, and those who develop the permanent housing with support services and jobs that enable people to

**TABLE 1.1. CONVENTIONAL VERSUS SYSTEMS THINKING**

| Conventional Thinking | Systems Thinking |
|---|---|
| The connection between problems and their causes is obvious and easy to trace. | The relationship between problems and their causes is indirect and not obvious. |
| Others, either within or outside our organization, are to blame for our problems and must be the ones to change. | We unwittingly create our own problems and have significant control or influence in solving them through changing our behavior. |
| A policy designed to achieve short-term success will also assure long-term success. | Most quick fixes have unintended consequences: They make no difference or make matters worse in the long run. |
| In order to optimize the whole, we must optimize the parts. | In order to optimize the whole, we must improve *relationships* among the parts. |
| Aggressively tackle many independent initiatives simultaneously. | Only a few key coordinated changes sustained over time will produce large systems change. |

Source: Innovation Associates Organizational Learning

end homelessness. Aligning providers along this continuum of care toward a goal of affordable permanent housing with support services increases everyone's ability to solve the problem.

The principle that solutions that work in the short run often have negative long-term effects, a phenomenon known as better-before-worse behavior, has significant implications for funders and policy makers. It raises what foundations call the philanthropic challenge—the task of determining how to fix a problem now versus help people over time. It also challenges public policy makers and business leaders to educate their constituents (such as private citizens and financial investors) about the risks of alleviating short-term pressures and fears without understanding the potential negative consequences of expedient solutions. In a world that promotes instant gratification, it can be difficult to remind people that "there is no such thing as a free lunch."

This contrasting principle is known in systems terms as worse-before-better behavior. This means that long-term success often requires short-term investment or sacrifice. If you want to motivate people to work toward long-term success, then you as a leader must act in accordance with your own highest, long-term aspirations. The principle challenges leaders to:

- Resist quick fixes that actually undermine long-term effectiveness.
- Set realistic expectations with the people they serve.
- Target short-term successes that deliberately support long-term results and provide people with true hope instead of false promises.

## Refining the Definition of Systems Thinking

Another useful distinction to introduce here is the difference between a system and systems thinking. The award-winning systems thinker Donella Meadows defined a system as "an interconnected set of elements that is coherently organized in a way that achieves *something* [italics mine]."[3] Meadows's definition points to the fact that systems achieve a purpose—which is why they are stable and so difficult to change. However, this purpose is often not the one we *want* the system to achieve.

Building on her definition, I define systems thinking as the ability to understand these interconnections in such a way as to achieve a *desired* purpose. One of the benefits of systems thinking is that it helps people

understand the purpose that a system is accomplishing. This prompts them to reflect on the difference between what they say they want (their espoused purpose) and what they are actually producing (their current purpose). Reconciling the difference between these two is the subject of chapter 9.

As a reader you may have come across different schools of systems thinking, such as general systems theory,[4] complexity theory, system dynamics, human system dynamics, and living systems theory. It is helpful to recognize that, while all these schools tend to agree on most of the systems principles described in table 1.1, they differ in the methodologies used to both analyze a system and identify ways to improve it.

This book is primarily based on the concept of causal feedback loops in systems, and uses the causal feedback loop diagramming tools first popularized in Peter Senge's management classics *The Fifth Discipline* and *The Fifth Discipline Fieldbook*.[5] These tools can be integrated with other kinds of systems analysis, such as system dynamics and soft systems methodology.

I emphasize the feedback tools for several reasons. As a co-founder with Charlie Kiefer, Peter Senge, and Robert Fritz of Innovation Associates, the consulting firm that pioneered many of the ideas referred to in Peter's book, I have thirty-five years of experience in working with these tools. I have also seen how powerful they can be in achieving sustainable, breakthrough change in the nonprofit, public, and private sectors—as well as in communities that engage leaders from all three sectors. Moreover, the tools are broadly recognized (as evidenced by the popularity of the work that Peter and many others among our colleagues have done) and readily understood by a wide range of people.

By introducing systems thinking as "the Fifth Discipline" of creating a learning organization, Peter Senge embedded what might otherwise be a purely technical and cognitive set of tools into a broader context. This context embraces multiple dimensions:

- **Spiritual:** The ability to see and articulate what will benefit diverse people over time.
- **Emotional:** The ability to master our emotions in service of a higher purpose.
- **Physical:** The ability to bring people together and enable them to collaborate.
- **Mental:** The ability to recognize how our individual and collective thinking affects the results we want.

This last point illustrates another critical benefit of this methodology, which is its emphasis on responsibility and empowerment. Every day, we can look around and see unintended consequences arising from what seemed at one time to be best-laid plans. Undoubtedly, whoever cast those plans had the best of intentions. A judge incarcerating parent after parent might have thought he was protecting citizens, but may not have fully understood he was also exacerbating problems for the children left behind, and perpetuating criminal behavior over time. The director of a shelter might have thought that she was protecting homeless people from the elements, but may not have fully understood that shelters divert critical resources from the even more humane and sustainable solution of permanent supportive housing.

In other words, burdens are shifted, unexpected results surface, and a host of other systems issues arise from good intentions. For any complex problem to be solved, the individual players all need to recognize how they unwittingly contribute to it. Once they understand their own responsibility for a problem, they can begin by changing the part of the system over which they have the greatest control: themselves. As we'll see in the pages ahead, the greatest opportunities for lasting change arise when all the players reflect on and shift their own intentions, assumptions, and behavior.

## Closing the Loop

- People's good intentions to improve social systems are often undermined when they apply conventional thinking to chronic, complex social problems.
- Systems thinking is different from conventional thinking in several important ways.
- A social system is always designed to achieve a purpose, although it might not be the purpose people say they want it to accomplish.
- The specific approach to analyzing a complex social system that is used in this book has many important benefits, and it can also be used to complement other analytic methods.

—CHAPTER 2—

# Systems Thinking Inside: A Catalyst for Social Change

In the summer of 2011 a group of leaders representing the Iowa Department of Education (IDE) and the state's regional Area Education Agencies (AEAs) met to improve how they worked together. The two organizations had historically been funded separately and operated independently even though both were responsible for the quality of K–12 education in the state. But new challenges had arisen: Budget constraints had amplified, and test scores had failed to keep pace with increases in the national average. Iowa's kids needed a better, more integrated support structure, and this demanded that the two organizations partner more closely. Other states face similar challenges: rising educational expectations, tighter budgets, and tensions between a central organization that promotes standardized systems and districts that want to pursue innovations tailored to their immediate constituents.

Forging a partnership is not easy, as demonstrated by the many examples of failed mergers in all sectors. However, in the case of Iowa education, the new partnership Collaborating for Iowa's Kids has been highly successful. Both organizations are now operating with a shared purpose, vision, and set of values; supporting a jointly developed theory of success; working toward common goals; meeting monthly along with local school districts; reviewing shared metrics; and achieving meaningful results. Since the program began four years ago, it has expanded to include 80–100 participants. An oversight group keeps strategies and initiatives connected and assures that new initiatives are truly collaborative. Work groups including IDE, AEA, and local school district members develop priority initiatives. The larger group operates as a learning community: reviewing data, addressing

unintended consequences of implementation actions, suggesting ways that implementation can be strengthened, and reviewing plans of work groups. An early literacy initiative has pilot districts throughout the state using comprehensive approaches that include professional development, protocols that serve as guides for students, school teams planning and monitoring implementation with AEA partners, assessment plans, coaches for K–3 teachers, and data collection and analysis.

What enabled this partnership to develop when so many others fall short of expectations? While there are many reasons, at least two relate to how the two groups were initially brought together. Early on, the leaders of both organizations began working with Kathleen Zurcher, an experienced consultant who continues to support the project, to define their shared aspiration—which is one anchor of a systems approach. Then the leaders applied systems thinking with me to deepen their understanding of why it might be difficult to collaborate despite their shared intentions to improve the lives of Iowa's kids.

Enabling them to develop this insight was facilitated by the fact that many chronic, complex problems can be viewed through the lens of systems archetypes—patterns of behavior that are so common within organizations, they have predictable consequences and well-understood solutions. The archetype playing out for these Iowa groups was clear: Accidental Adversaries. While each group had been conceived as part of an overall system whose actions would benefit all, each group had come to focus on its individual responsibilities and success. In the process each made life harder for the other, limiting the success of both groups and the system as a whole. For instance, the IDE had introduced many new programs to achieve its goal of providing guidance and governance to the state education system. However, these programs had disrupted the AEAs' abilities to manage their own resources, which led them in turn to either customize or disengage from the IDE initiatives, thereby making IDE's work more difficult.

The story of Accidental Adversaries resonated with both parties. It motivated them to have new conversations about how they could work as a unified system to maximize the benefits of their partnership and avoid the unintentional problems they had created for each other. The parties agreed that the role of the IDE was to set direction and lead, and the role of the AEAs was to implement. As a result, IDE moved from

blaming AEAs for operating independently to working with them to meet regional needs within the statewide context, and AEAs worked to adjust their individual initiatives to fit within the statewide direction and plans. They also agreed that the local school districts (formally known as Local Education Agencies or LEAs) were integral and needed to be included in the systemwide alignment work. And finally, they committed to focusing their efforts and resources on selected priorities—beginning with the early literacy initiative.

Mark Draper, the director of special education for the Green Hills AEA, said of the initial systems analysis meeting. "This has been the most concrete and useful conversation I've had on the relationship between our two groups in the past 20 years." Connie Maxson, who was the bureau chief of teaching and learning services for the Department of Education, said, "This has been the best conversation I've had on the relationship between our two groups in the seven years since I've been here." Their understanding of the Accidental Adversaries dynamic helped build not only stronger relationships between the IDE and AEA system, but also over time between the AEA system and individual AEAs, the local school districts and the IDE, and the local school districts and individual AEAs.

## How Systems Thinking Meets Four Challenges of Change

How does systems thinking help people achieve sustainable, breakthrough change? The Iowa education story—and many others—points to ways in which thinking systemically meets four common challenges of change.

First, systems thinking *motivates* people to change because they discover their role in exacerbating the problems they want to solve. For example, the IDE came to see that rolling out new programs to the AEAs without sufficiently taking their needs into account led the AEAs to customize or disengage from these programs, thereby creating inconsistent, low-quality solutions that made the IDE's own work more difficult. On the other side, the AEAs recognized that customizing or disengaging from statewide programs led the IDE to initiate even more programs that stretched the AEA's own resources.

Second, systems thinking *catalyzes collaboration* because people learn how they collectively create the unsatisfying results they experience. In the

case of Iowa, both parties came to see that their localized solutions undermined their own organization's effectiveness and children's abilities to learn. They recognized that they were in the same boat, one of their own making, and that only by working together could they design a more seaworthy craft. Based on these insights, they developed new principles and structures for partnering over time and applied systems thinking again to organize their efforts around a common theory of success.

Third, systems thinking *focuses* people to work on a few key coordinated changes over time to achieve systemwide impacts that are significant and sustainable. This approach contrasts with people's tendencies to try to do too much with too few resources and achieve less as a result. In Iowa, the organizations chose to target specific high-leverage educational outcomes beginning with early-childhood literacy because of its pivotal role in long-term student performance.

Fourth, systems thinking *stimulates continuous learning*, which is an essential characteristic of any meaningful change in complex systems. The inherent and ever-changing complexity of social problems forces people to accept that knowledge is never complete or static. Learning is a more powerful mind-set than knowing because it enables us to keep adapting in the face of new information and conditions.[1] In Iowa, the organizations put in place a process for assessing their progress and adjusting their joint strategies over time.

Table 2.1 summarizes these four change challenges and illustrates how systems thinking differs from the more common approaches to bringing diverse stakeholders together in service of social change. While many typical approaches help people recognize their shared aspirations, they often fall short, failing to show people how they are responsible for current reality.

As Peter Senge observed in *The Fifth Discipline*, "The building of shared vision lacks a critical underpinning if practiced without systems thinking." He goes on to say, "The problem lies not in shared visions themselves, so long as they are developed carefully. The problem lies in our reactive orientation toward current reality. Vision becomes a living force only when people truly believe they can shape their future. The simple fact is that most managers do not *experience* that they are contributing to creating their current reality. So they don't see how they can contribute to changing that reality."[2] When people fail to see their responsibility for the present, they (1) tend to assume that their primary work is to change others or the system—not themselves, and (2) promote solutions that optimize their part of the system based on

TABLE 2.1. MEETING THE CHALLENGES OF CHANGE THROUGH SYSTEMS THINKING

| The Challenge | Benefits of a Systems Thinking Approach | Characteristics of a Conventional Approach |
|---|---|---|
| **Motivation:** Why should we change? | Show responsibility for current reality | Appeal to desire or fear |
| **Collaboration:** Why should we work together? | Demonstrate how people's current ways of interacting undermine both their individual and their collective performance | Tell people they should |
| **Focus:** What should we do? | Use leverage to change the few things that change everything else | Tackle many issues independently and simultaneously; attack symptoms |
| **Learning:** Why bother? | Recognize that our actions matter, and that we need to learn from the consequences of our actions | Assume that others are at fault and must learn |

a mistaken belief that the way to optimize the whole system is to optimize each of the parts. By contrast, a systems view encourages them to critically assess their own contributions first.

## When to Use Systems Thinking

Since 1991 Intel has used the motto "Intel Inside" to emphasize that its chips power computers around the world. Like those chips, systems thinking powers change within many other change management frameworks. Because it can be embedded in many different methodologies, including the one described in this book, I think of it as "Systems Thinking Inside."

It is especially effective to incorporate systems thinking into a broader systems approach when:

- ☐ A problem is chronic and has defied people's best intentions to solve it.
- ☐ Diverse stakeholders find it difficult to align their efforts despite shared intentions.
- ☐ They try to optimize their part of the system without understanding their impact on the whole.

## Closing the Loop

- Systems thinking helps people meet four challenges of change: It increases their motivation to change, catalyzes collaboration, enables focus, and stimulates continuous learning.
- Use systems thinking for chronic, complex problems where diverse stakeholders find it difficult to align their efforts despite shared intentions.
- Systems thinking can be used within different change management models. For example, by helping people become more vulnerable and see the big picture, systems thinking supports four conditions for Collective Impact: developing mutually reinforcing activities, building a common agenda, determining shared measurement, and nurturing continuous communication.

—CHAPTER 3—

# Telling Systems Stories

In November 2006, The After Prison Initiative (TAPI), a program of the US Justice Fund of the Open Society Institute (OSI), convened a three-day retreat in Albuquerque, New Mexico, to accelerate progress on ending mass incarceration and harsh punishment in the United States.[1] Aptly named Where Are We Going?, the retreat brought together one hundred progressive leaders—activists, academics, researchers, policy analysts, and lawyers—to clarify what else could be done to facilitate successful reentry of people after incarceration and redress the underlying economic, social, and political conditions and policies that contribute to making the US the world's largest incarcerator among developed nations.

To give you an idea of the scope of the problem, the United States has 2.5 million people behind bars today—versus 200,000 in the 1970s—and approximately 650,000 return home each year. The meeting was grounded in a recognition of how the US criminal justice system—from the beginning and at an accelerated pace since the 1970s—is determined by race, and how society, in the words of Berkeley law professor Jonathan Simon, is increasingly "governed by crime."[2] Most of the participants at the retreat were Soros Justice Fellows or OSI grantees who competed for OSI funding at the same time that they shared a commitment to criminal justice reform.

The challenge presented by this and many similar retreats was that the diverse stakeholders required to solve a chronic, complex problem often do not appreciate the many and often non-obvious ways in which their work is connected. Taking this challenge into account, the goals of the meeting were to:

- Develop a shared understanding of why US incarceration rates and rates at which people return to prison are so high.

- End over-incarceration; create new opportunities for and remove barriers to successful reentry of formerly incarcerated people.
- Strengthen working relationships and collaborations among the advocates.
- Deepen awareness of the interdependencies (both reinforcing and potentially conflicting) among their diverse efforts.
- Identify new ways to strengthen civil society institutions and promote civic and political inclusion.

Perhaps the most radical new tool introduced at the retreat was systems thinking. Working under a grant supported by OSI, the organizers of the retreat, Joe Laur and Sara Schley of Seed Systems, recognized that tackling the same problems with the same mind-set and strategies often produces the same, largely unsuccessful, results. They believed that systems thinking might help people in the field get "unstuck," better understand their theory of change, and devise new strategies and ways of collaborating.

Joe and Sara asked me to introduce systems thinking and systems mapping to help participants create a shared story of why mass incarceration and high recidivism rates persisted, as well as to identify what more they could do to reduce these rates. This picture needed to include the contributions of all participants to the solution, an explanation of why their independent efforts fell short, and insights into what they could do more effectively given limited resources and an urgent need for change.

## Storytelling for Social Change

Telling stories is a powerful way to make sense of our own experience and of the world around us. Stories shape our identity, communicate who we are and what is important to us, and move others to act. They are a primary way of distilling and coding information in memorable form. Leaders use them to inspire others. Peace builders recognize narrative as a key source of conflict (people interpret historical facts in very different and incompatible ways), and they work to help disputants both appreciate each other's narratives and modify their own. Therapists use storytelling to help people heal from trauma by supporting them to shape a new and more constructive narrative based on past experience.

Likewise, people committed to social change often share a similar story of what they are trying to accomplish and the challenges they face. Three key elements of this story are:

- The world, in the words of Martin Buber, "stands in need of us," and we are called to contribute our gifts and resources to support those less fortunate than ourselves.
- We are not making the impact we want despite our best intentions.
- The major obstacles to our success are limited resources and the behavior of others in the system.

While the first two aspects of this story are helpful and move people to act in positive ways, the belief that the primary causes of problems are beyond their control holds people back from being as productive as they could be. By attributing shortfalls to limited resources and assuming that others need to be the ones to change, people tend to minimize the impacts of their own intentions, thinking, and actions on their effectiveness.[3] Moreover, because many of the stakeholders compete for limited funds, in this case from The After Prison Initiative, they naturally promote their own successes, downplay their failures, and sometimes may be reluctant to collaborate.

In order to optimize the performance of the entire system, people need to shift from trying to optimize their part of the system to improving relationships among its constituent parts. In the case of US criminal justice, the broader system includes how crime is currently fought, the negative unintended consequences of this system structure, and reformers' efforts to mitigate these consequences and redesign the structure. People need to:

- Understand how focusing on their part of the system—the grantees' reform work in this example—not only supports but might also limit the effectiveness of the whole system.
- Appreciate the non-obvious as well as obvious ways in which they are connected to one another as reformers and to others in the system.
- Recognize the unintended impacts of their intentions, thinking, and actions on both others and themselves.
- Apply this increased self-awareness to shifting how they relate to others in the system.

Even if people's contributions to an existing situation are not obvious, it is important, in the words of Jesse Jackson, that they tell themselves, "We might not be responsible for being down, but we are responsible for getting up." In other words, empowering themselves through greater self-awareness is the first step in changing their reality.

Systems thinking can help people tell a new and more productive story. It honors their individual efforts and surfaces the limitations of these efforts. It distinguishes the short- and long-term impacts of their actions. It aligns their diverse views and stories into a bigger picture where individual contributors can see their part in relation to the whole. Seeing the big picture and their role in it, people are more motivated and able to work together to redesign the whole.

## Shaping a Systems Story

In order to tell a systems story, people need to make three shifts:

- From seeing just their part of the system to seeing more of the whole system—including why and how it currently operates as well as what is being done to change it.
- From hoping that others will change to seeing how they can first change themselves.
- From focusing on individual events (crises, fires) to understanding and redesigning the deeper system structures that give rise to these events.

### SEEING THE BIG PICTURE

The ancient Sufi story of the blind men and the elephant illustrates the challenge of enabling diverse stakeholders to see the big picture (see figure 3.1). Each party touches a different part of the elephant and tends to assume that what they experience is *the* elephant instead of just one part of a more complex reality. Moreover, they tend to see reality in terms of what they are doing well, are rewarded for doing, and could do better if they had more resources. On the other hand, people either fail to appreciate or question the value of others' contributions. In addition, they often do not have the tools to see a more complex world and understand

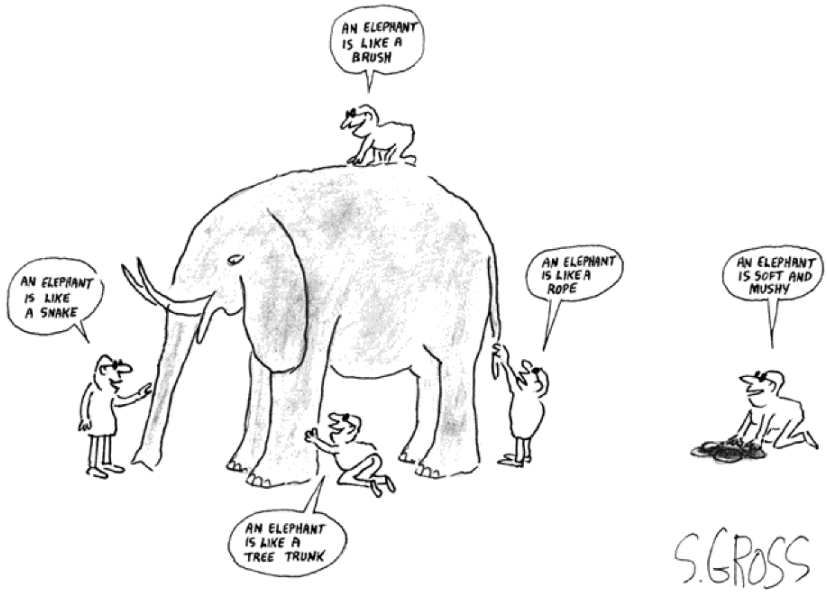



**FIGURE 3.1 THE BLIND MEN AND THE ELEPHANT.** Everyone sees part of a more complex reality and tends to assume that what they see is the whole picture. Sam Gross/The Cartoon Bank

how their intentions, thinking, and actions interact with those of other stakeholders.

In the TAPI case, participants naturally began by seeing solutions to the problem of over-incarceration and failed reentry through their respective specialties. Some focused on sentencing reform to reduce the length of sentences and time served, or the institutional work of resettlement and supportive services, or reorienting parole and probation policies. Others focused on challenging the prison lobby that benefits from current penal laws, or reducing the resistance of public officials to more effective and innovative approaches to reentry. Still others focused on convincing elected officials that tough-on-crime laws make for good politics but bad policy. They entered the group through their own silos. The challenge was to help them expand their perceptions by appreciating how their success depended on the success of all the other stakeholders (including those *not* present at the meeting), and then motivating them to collaborate more effectively with one another (again including those

not in the room) to improve public safety in cost-effective and sustainable ways.

The first step was to create a strong and safe container for people to share their different perspectives. This is what I call convening people systemically, and what Marvin Weisbord originally called "getting the whole system in the room."[4] In this case the system was represented in person by those committed to criminal justice reform, while the perspectives of tough-on-crime advocates were depicted on the systems map that included their policies, assumptions, and actions. The facilitators, Joe and Sara, built a container for the retreat participants by building diverse ways of communicating into the agenda, including: expert presentations, panels around specific issues, reports on innovations being tested by several participants, dialogues, a World Café (see more on this and other convening methodologies in chapter 5), and systems mapping.

They incorporated systems mapping because they recognized that convening people systemically is necessary but not always sufficient to mobilizing collaboration. This is true for several reasons:

- Even when people share common values and goals, as those in the TAPI meeting did, they tend to assume that the best way to optimize the system is to optimize their individual part. This assumption is often reinforced by metrics and rewards that encourage people to do what they are already doing.
- By contrast, participants might either fail to appreciate or actually blame (however covertly) others in the room for their inability to be even more effective.
- Some stakeholders are not included in such gatherings because they do not appear to share the same aspiration, are viewed as the source of the problem, and/or are more difficult to access by the conveners. In this case affirming a united front among the participants can mislead them into thinking that they are doing the best they can and others not in the room are to blame. While many TAPI participants were engaged in collaborative efforts with those not present at the meeting, it was important to reaffirm this strategy and avoid the risk of attributing breakdowns in the system solely to other stakeholders.

By contrast, one of the premises of systems thinking as described in chapter 1 is that the best way to optimize the system is to improve the relationships among its parts, not to optimize each part separately. This includes those present in a particular gathering and those who do not participate, those who support change and those who resist it. Helping people who are convening systemically to also *think* systemically enables them to consider collaborating with all stakeholders as a first, though not necessarily the only, option. A systems map enables individual stakeholder groups to see how they contribute to the performance of the system as a whole, both positively and negatively.

For TAPI participants, one of the key insights from the systems map (which is detailed in chapter 7) was that the underlying concern of the public and its elected representatives had more to do with the fear of being victimized by crime and racism than actual crime levels themselves. Although crime levels have actually declined since 1991 by approximately 25 percent, people's fears of being victimized by violent crime continue to rise—as does the perception that crimes are more likely to be committed by people of color, which in turn causes race-associated fear to rise. Even though the criminal justice system consumes enormous tax dollars, public officials who promote mass incarceration often fan fear deliberately to win votes or do so unwittingly by resisting efforts to ameliorate this fear. For example, they resist innovative approaches to resettling formerly incarcerated people (approaches that could reduce recidivism) and fail to distinguish technical from substantive parole violations out of their own fear of appearing soft on crime. This insight led the TAPI participants to think of new ways of collaborating with one another as well as extending themselves to reduce the fears of well-intentioned public officials and concerned citizens who were not at the meeting.

## INCREASING SELF-AWARENESS AND PERSONAL RESPONSIBILITY

The natural tendency to view one's own contributions favorably in relation to those of others is intensified by competition. People with a shared aspiration often compete for resources, which increases their reluctance to either acknowledge their own shortcomings or value the contributions of others.

By contrast, a systems story uncovers how people contribute, albeit unwittingly, to their own problems despite their best intentions. Raising

self-awareness in this way actually increases their abilities to be more effective. Rather than depending on others to change in order to be successful, they discover that the greatest leverage they have in a system begins with changing themselves. They learn to recognize that taking responsibility for their own intentions, thinking, and behavior gives them more power to create what they want.

Some TAPI participants became more motivated to initiate collaborations with others in the room when they understood the key ways in which they were interconnected. Several also recognized that framing criminal justice reform as a way to help elected officials generate votes by reducing prison costs and recidivism could benefit the reform movement.

## UNDERSTANDING THE DEEPER SYSTEM STRUCTURE

One tool for developing an initial picture of "the elephant" (that is, any complex system) is known as the iceberg metaphor. The iceberg is a simple way of distinguishing problem symptoms from underlying or root causes. As shown in figure 3.2, it distinguishes three levels of insight—each of which is informed by a specific question and prompts a certain type of action or response.

More specifically, the iceberg distinguishes the *events* level (what we see most easily) from the *pattern of behavior or trend* that links many events over time, and then goes deeper to expose the underlying *systems structure*—the hidden 90 percent of the iceberg that causes the most damage because it shapes the trends and events. Systems structure includes tangible elements such as the pressures, policies, and power dynamics that shape performance. It also includes intangible forces such as perceptions (what people believe or assume to be true about the system) and purpose (the actual versus espoused intentions that drive people's behavior). The deeper people's level of insight, the greater their opportunity to change the way the system behaves.

People often focus their attention and spend most of their time on responding to individual *events*. They want to know what is happening so that they can react quickly to the crisis at hand. For example, people who support (and oppose) criminal justice reform look at news reports on the latest crime statistics, the number of people recently returned to prison because of repeat offenses or technical parole violations, new legislation,

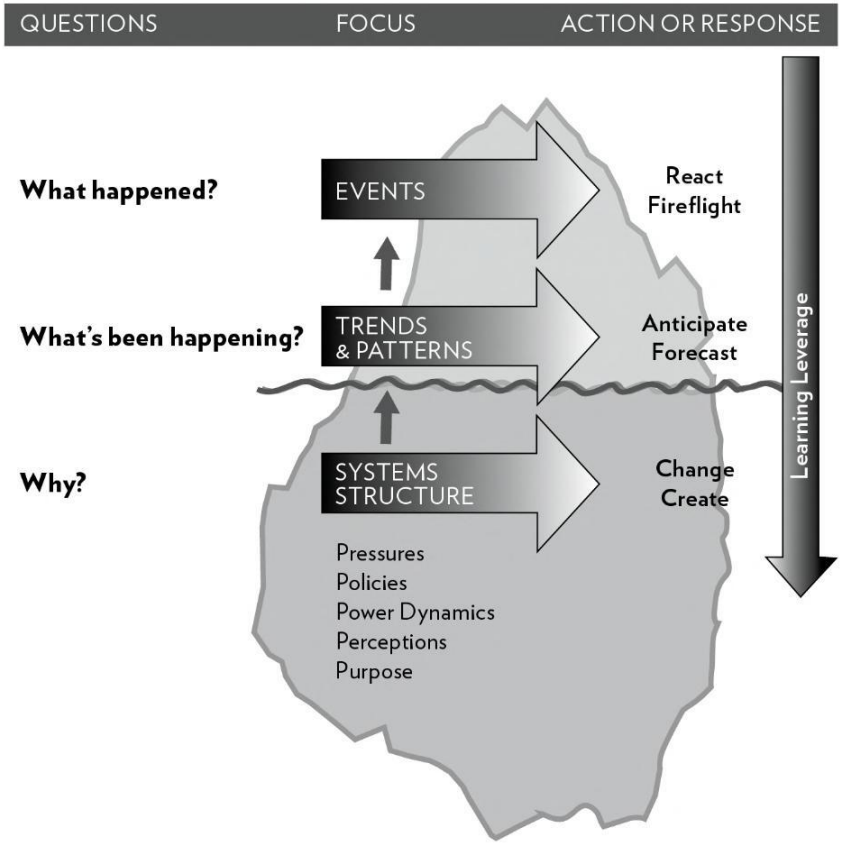



**FIGURE 3.2 THE ICEBERG.** The iceberg helps you to begin to distinguish a problem's symptoms from its root causes. Innovation Associates Organizational Learning

and costs of the prison system. How people respond to a crisis can have an enormous impact on their effectiveness. Since 95 percent of people sent to prison are eventually released, and many of them are unprepared or unable to resettle productively, get-tough prison sentences often increase recidivism—further destabilizing communities and making them less safe. Moreover, the costs incurred in maintaining the system divert funds that might otherwise be available to strengthen the disadvantaged communities from which a disproportionate number of residents are incarcerated.

Sometimes people step back from individual events long enough to recognize ongoing *trends or patterns*. They ask what has been happening

over time and try to anticipate the future based on the past. Trends can often be surprising and disturbing. For example, TAPI participants noted that incarceration levels continued to rise by an estimated 60 percent since crime levels reached their peak in 1991, *despite* a reduction of 25 percent in crime during the same period (see figure 3.3). This led them to conclude that fear, as well as racism, drives current criminal justice policies more than the level of crime itself. Some criminologists believe that no more than 25 percent of crime reduction is attributable to incarceration.[5] Others argue that the same trend data prove the beneficial impact of incarceration on reducing crime, which points to the importance of perceptions or mental models as another aspect of systems structure to be explored below.[6]

The root causes of a chronic, complex problem can be found in its underlying *systems structure*—the many circular, interdependent, and sometimes time-delayed relationships among its parts. The structure includes both easily observable elements—such as current pressures, policies, and power dynamics—and less obvious factors such as perceptions and purposes (goals or intentions) that influence how the more tangible elements affect behavior.

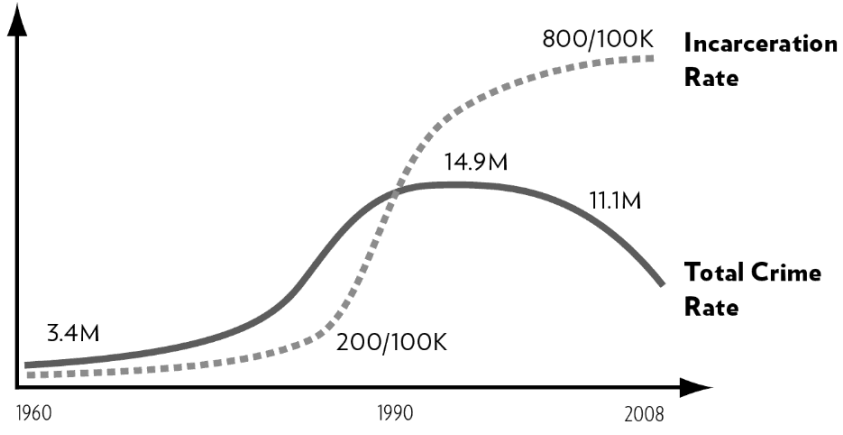



**FIGURE 3.3 US CRIME VERSUS INCARCERATION RATES.** The growing gap between an increasing incarceration rate and decreasing crime rate raises serious questions about the relationship between the two. Crime rate trend adapted from DisasterCenter.com. Incarceration rate trend adapted from The Hamilton Project, Brookings Institution.

## The Elements of Systems Structure

People communicate with one another through language and often through the stories they tell. Michael Goodman, one of the pioneers of the approach used in this book and a longtime colleague of mine, explains that systems thinking can be thought of as a *language*—a visual language that helps us understand and talk about the world in a way that is different from our daily language. The metaphor of language is important because language shapes our perceptions, and hence our behavior. The root of the magical incantation *abracadabra* relates the powers of speech and action, as it comes from either the Aramaic "I will create as I speak" or the Hebrew "It came to pass as it was spoken."[7] In either case, systems thinking is a language that more accurately explains complexity than our everyday language and thus enables us to work more effectively with social systems.

The most basic elements of this language are nouns, verbs, and adverbs (time delays). In addition, when we look more deeply into social systems, we discover that there are certain *plot lines* that appear across a wide variety of issues (whether in education, criminal justice, or homelessness) and at multiple levels of a system (for example, in homes, organizations, or communities).

The most basic plot lines are stories of amplification (called reinforcing feedback) and correction (called balancing feedback). These combine into more complex yet highly recognizable archetypal stories because they are so embedded in the human experience. Knowing the basic stories and systems archetypes gives us initial insights into many chronic, complex problems. Developing a richer and more comprehensive understanding often comes from modifying and combining archetypes—which is similar to illuminating the variations on plots and multiple interacting plots in a historical or fictional story.

Finally, we will look at the bottom of the iceberg to uncover what are described in complexity theory as *attractors*, the pulls that shape and stabilize a system's behavior around a limited number of possible states. These deep structures are the beliefs or assumptions that people in social systems try to validate, and the underlying intentions or purposes they seek to realize. Depending on your assessment of the system's current performance, they can be viewed as either positive or negative. Attractors

are the underlying drivers of both system equilibrium and its resistance to change.

## BASIC LANGUAGE OF SYSTEMS THINKING

### Nouns

The nouns of systems thinking are variables, those forces or pressures at play in the system. Variables "vary" over time; they can increase, decrease, or oscillate. Variables can be qualitative or quantitative and are readily framed as "Levels of ___." Common variables that Michael Goodman and I have identified include what people value (such as the level of expectation or goal), demands on the system (such as the level of need or pressure), resources to meet these demands (such as the level of investment or skills), and actual results (such as the level of performance or effectiveness). They also include perceptual factors that express how people feel and think (such as the level of fear or aversion to risk).

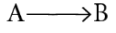
Since variables are the basis for systems stories, defining them is a key task.[8] Significant insights can emerge from clarifying what they are—and what they are not. For example, a breakthrough insight for the TAPI participants was that the fear of being victimized by crime can drive behavior in the criminal justice system more than the level of crime itself. In a very different situation—the effort to rebuild civil society in Burundi after its 1990–94 civil war—NGOs that developed a systems analysis of the conflict determined that the driving factor in the war was not the resources of the Tutsis versus those of the Hutus, as they originally thought, but the power of the elite versus that of the majority. They determined this by recognizing that, when Hutus wrested power from the Tutsis, Hutu leaders became the new elite. In other words, Hutu leaders displayed the same tendency to accumulate resources at the expense of the majority of the population, just as Tutsi leaders had previously fought to retain their power. This insight led them to recognize the importance of another factor, ethnic manipulation, used by elites of both groups to gain and retain power at the expense of their constituents.[9]

Some of the other key variables in the TAPI case were: number of people released from prison, problems with resettlement, technical parole violations, sectors benefiting from the current system, cost of prisons, and (lack of) money available for resettlement. Other qualitative factors

included fear for personal safety, political risks, and political resistance to innovation.

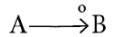
### Verbs

The fundamental action described in systems thinking is that an increase in one variable causes an increase or decrease in one or more other variables. This action is described pictorially as follows:




When a change in **A** causes a similar change in **B** (for instance, an increase in **A** causes an increase in **B**, or a decrease in **A** causes a decrease in **B**), we can put an **s** for "similar" at the end of the arrow.

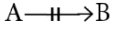

Alternatively, if a change in **A** causes an opposite change in **B** (an increase in **A** causes a decrease in **B** or vice versa), we can put an **o** for "opposite" at the end of the arrow.[10]




While this nomenclature is helpful in building the story, we normally leave it out of the final pictures and instead explain the causal directions verbally on a systems map using descriptive words. This helps people unfamiliar with systems thinking to understand the diagrams.

### Time Delay

*How long* it takes for a change in **A** to cause a change in **B** is a critical factor in systems thinking. This is because, as noted in chapter 1, the short- and long-term impacts of the same action are often reversed. In other words, short-term improvements can produce long-term consequences that neutralize or undermine more immediate gains. Conversely, we often need to invest time, money, and effort in the short run to achieve benefits that are sustainable over time. Time delays are depicted as follows:



Michael Goodman and I have identified at least four types of delays in complex social systems. These are the times between:

- The change in a condition and our awareness that the condition has changed.
- Our awareness that the condition has changed and our decision to act.
- The decision to act and the act of implementation.
- Implementation and a corresponding change in the condition.

For example, a current and increasingly serious example is climate change. Although carbon dioxide levels in the atmosphere have increased by more than 45 percent in the past two hundred years, it is only recently that most people have been made aware of the danger of these increases through turbulent weather patterns and rising sea levels. Moreover, because of our dependence on energy-intensive lifestyles and carbon fuels, it has been difficult to mobilize the political will to commit to new energy policies. Assuming we can now make hard decisions, it will still take many years to shift how we conserve energy and manufacture it from environmentally neutral sources. Once we implement these changes, it will take additional time to reduce carbon dioxide levels to necessary levels, though it may already be too late to reverse some changes such as rising sea levels from melting icebergs.

Going back to the TAPI example, there are at least four significant time delays related to the penal system and criminal justice reform:

- The time between when people go to prison and are released—that is, the length of sentences and time spent in prison. Because many sentences have become harsher, it can take many years before people reenter society. The 95 percent of prisoners who are eventually released often face serious barriers to reentry, created in part by the very length of their confinement.
- The delay between the public's fear of crime and their understanding that crime has in fact declined.
- A delay between the number of people incarcerated and concerns about the costs of the penal system. In the years since the TAPI retreat took place, these costs have become even more of a strain on public budgets, reaching an all-time high of eighty-five

billion dollars a year, and motivating officials to seriously consider reforms to incarceration.

- The delay between recognizing the costly limitations of mass incarceration and actually shifting funds to the more promising investment of strengthening community institutions—such as education, health care, and employment—that create safer, more prosperous communities.

Because of the pressure to show immediate results—whether self-generated or created by such factors as public opinion, budget cycles, investor expectations, and voting cycles—it can be difficult for policy makers to respect and work with time delays. Leaders can respond more effectively to this pressure when they learn to distinguish *quick fixes* from *short-term small successes*. Quick fixes are solutions that produce short-run benefits, which are typically neutralized or eroded by longer-run consequences of the same actions. Short-term small successes are improvements that are planned from the beginning with the long term in mind and are vital to encouraging persistence and maintaining momentum. This distinction will become clearer when we look at leverage points and strategic planning in greater detail, but these basics will help as we further explore systems plots.

## Closing the Loop

- When faced with a complex problem that persists despite their best efforts to solve it, people tend to blame limited resources as well as promote their own successes, downplay their failures, and view others in the system competitively.
- Systems thinking helps people tell a new and more productive story that honors their individual efforts, surfaces the limitations of these efforts, and supports them to see the big picture and collaborate more willingly on behalf of the whole.
- The iceberg metaphor enables people to distinguish between more obvious events and trends, and the underlying systems structure that shapes them.
- Systems structure describes key factors in the system and how they affect one another in often non-obvious ways over time.

—CHAPTER 4—

# Deciphering the Plots of Systems Stories

I love murder mysteries, first made famous by British writers such as Agatha Christie and a staple of popular TV shows like the long-running *CSI*. The essential question they pose is "Who done it?" and the reader/viewer is kept in suspense until the very end in the hope of answering that question. Systems stories are driven by a different question: "Why are people unable to solve a chronic, complex problem or achieve a meaningful goal—often despite their best efforts?" In order to answer this question, it helps to recognize discernible plot lines that tend to shape the behavior of people in social systems.

Many of these plots share a similar and challenging characteristic. Social systems are not only surprising but also, in the words of systems thinker Donella Meadows, "perverse."[1] I think of them as seductive in that they tend to lead people to do exactly the wrong thing for all the right reasons.

Because these plots are so common, they are called systems archetypes. The better people understand them, the less likely they are to become victimized by them. People can learn to anticipate and prevent these stories from seducing them into doing the wrong thing. Alternatively, if people do become trapped, they can follow equally recognizable paths (known as leverage points) to extricate themselves.

## Basic Plot Lines

Several years ago, a participant in a systems thinking workshop analyzed a problem he had tried to solve for a long time. He said, "And to think that I have been going around in circles on this issue for years." At that moment I

realized that the problem was not so much that he had been "going around in circles," but that he was *unaware* that he was doing so. The solutions he had tried previously were obvious and effective in the short term. However, they had created unintended consequences in the long term that made matters worse. Moreover, when the problem recurred, he failed to see how his own solutions contributed to it. Seeing the circles that he was not only embedded in but also helped create freed him to break out of them and identify a more productive path forward. We go around in circles of our own making without realizing it.

Since systems plots unfold in circles, our goal is to uncover the existing ones so that we can create new and more effective stories. While the emphasis in this chapter is on describing the dynamics—not shifting them, a topic that is more fully addressed in chapter 10—it is important to realize that the act of recognizing the circles you are caught in is the first step toward altering them. *Increasing self-awareness is an intervention in and of itself, and the precursor to making any other changes.*

Reinforcing and balancing feedback are the two basic circular structures that describe how systems evolve over time. More complex dynamics result from combinations of these two feedback structures.

## REINFORCING FEEDBACK: THE STORY OF AMPLIFICATION

Reinforcing feedback is the basis for what we know as virtuous and vicious cycles. It explains the development of both engines of growth or flywheels as well as spiraling deterioration. For example, Jim Collins has applied the flywheel concept he introduced in his book *Good to Great* to suggest how social sector organizations can develop their own engines of success.[2] He believes that success in the social sector hinges on the ability to grow organizations (not just programs) by building a brand that attracts support, which yields demonstrable results and in turn strengthens the brand. Collins also points out that the same reinforcing dynamic can produce the opposite effect, as when an organization that performs poorly weakens its brand reputation, which makes it more difficult to attract resources and drives results down even further.

The unstable nature of reinforcing feedback is painfully evident in boom-and-bust cycles such as the housing bubble that set off the 2008 economic crisis. In this case, unsafe subprime mortgage lending practices fueled

increased housing prices and more lending—until the bad mortgages could no longer be spread farther and the housing market collapsed.[3]

Reinforcing dynamics also appear in self-fulfilling prophecies. For example, the Pygmalion effect explains how one party's expectations (in this case, a teacher's) lead another party (a student) to behave in ways that reinforce these expectations. This dynamic tends to encourage the performance of well-behaved girls and work against active boys and minorities. The Interaction Map developed by Action Design and shown in figure 4.1 describes these interactions in greater detail.

Most people are accustomed to thinking of growth as linear. However, reinforcing feedback describes a more common process in social and economic systems—that of exponential growth in which a quantity increases by a constant percentage of the whole in a constant time period. Such

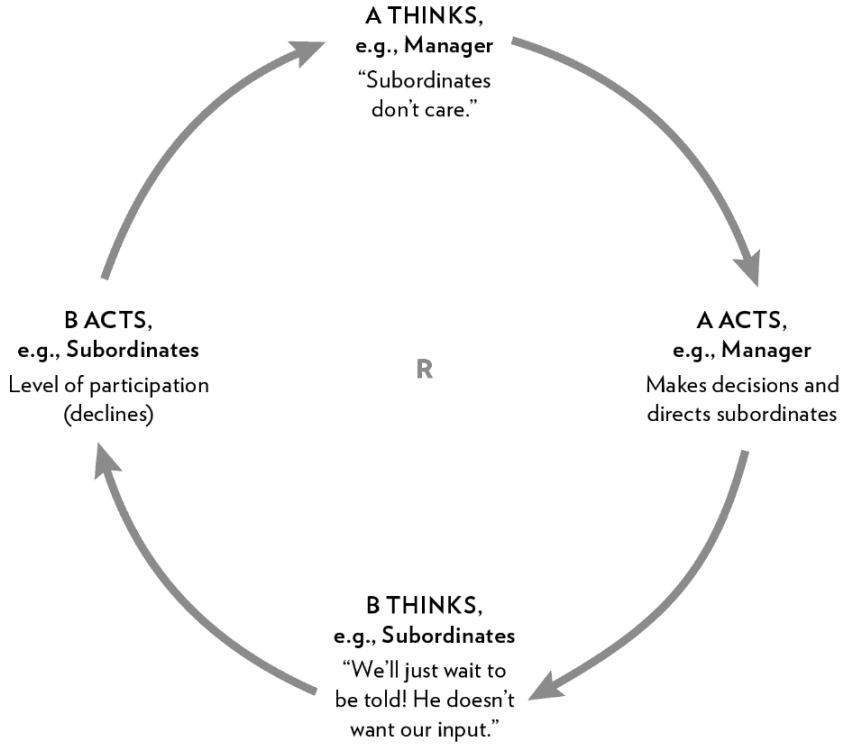



**FIGURE 4.1 INTERACTION MAP.** How parties A and B think about and behave in relation to each other is mutually reinforcing. Adapted from Action Design

phenomena as increases in savings and population are familiar illustrations of exponential processes. Foundations and entrepreneurs seeking a long-term return on their social investments benefit from cultivating critical mass or tipping points that build sustainable momentum in a social system.[4]

The following French riddle points out several important implications of exponential growth.[5] Imagine a lily pond where the lily plant doubles in size every day, and the pond is totally covered by the lily in thirty days. When is the pond half covered? The answer, which is surprising for many, is day twenty-nine: Half of the pond is covered just one day before the pond is completely blanketed by the lily. How much of the pond is covered in fifteen days? The answer here is 0.0025 percent. In other words, halfway into the month the lily is barely noticeable.

The exponential nature of organic growth has several consequences for social decision makers. First, most people tend to expect to see improvements faster than they are capable of developing. Expecting the system to shift quickly can lead to unrealistic demands for growth that ultimately slow improvement down if not kill it entirely. Alternatively, people can miss or misinterpret small improvements and give up prematurely on supporting a change that takes time to manifest. Figure 4.2 depicts the exponential nature of organic reinforcing growth and contrasts it with the more typical linear assumption people hold about how things *should* grow.

Second, a success engine or flywheel is built not only on the individual factors that contribute to growth, but also on how these factors interact to reinforce one another over time. For example, successful micro-lending programs integrate community involvement, peer support, financial investment, economic results, job creation, and community reinvestment in ever-expanding spirals. An implication for social investors might be that they evaluate grantee plans based on the clarity and soundness of their structural design—how the parts fit together—rather than on the individual elements themselves. We will return to how systems thinking can contribute to articulating such a design or theory of change in chapter 11. For now it can be helpful to notice that one approach to increasing the effectiveness of a theory of change is to explain how parts of the system are intended to interact in both direct and indirect ways over time.

Third, since exponential growth also applies to seemingly trivial problems getting much worse over time, it is important to monitor such problems early on and consider addressing them rapidly instead of hoping they go

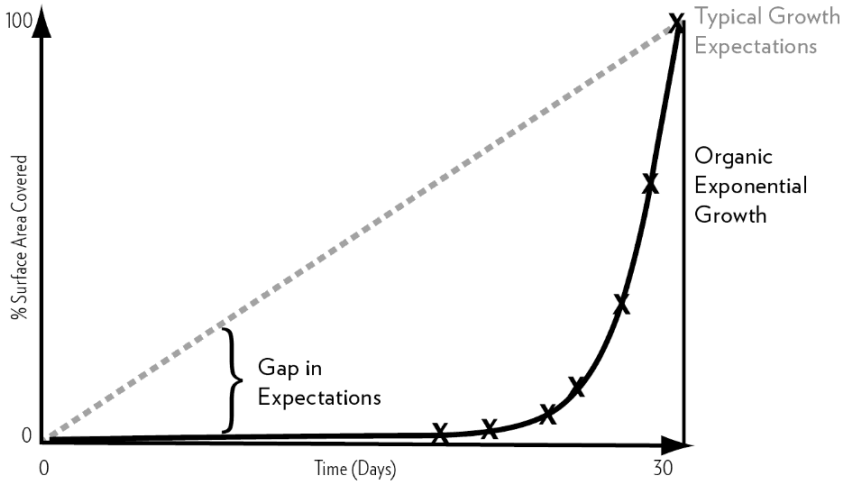



**FIGURE 4.2: LESSONS FROM THE LILY POND.** People tend to assume that growth occurs more quickly (and linearly) than it actually does. It is important to reduce the resulting gap between expectations and reality. Innovation Associates Organizational Learning and Bridgeway Partners

away. Decades ago, the recognition that small problems fuel bigger ones inspired what's known as the broken windows theory, which suggests that community instability is catalyzed by disorderly conditions.[6] The theory has led police departments around the country to control minor misbehaviors—from littering to vandalism—and maintain a clean environment in order to prevent major crimes from occurring.[7] Critics of the theory argue that petty crime is itself a function of concentrated urban poverty, and that a significant and sustainable reduction in crime levels can only be achieved by improving the quality of life in poor neighborhoods. But either way, the plot is the same: Addressing upstream problems can prevent them from growing exponentially worse.

On the other hand, our failure to address climate change in a timely way represents a serious example of underestimating the severity of a problem by depending on trend data alone. Key decision makers in government and the private sector have resisted recommendations to severely cut carbon dioxide emissions in part because of our dependence on fossil fuels and in part because the problem grew so slowly (as measured by the trend of global temperatures) as to not raise alarms until recently when we are experiencing the effects in real time. An understanding and

acknowledgment of the vicious cycles in nature that produced this trend (see appendix A) might have increased political will earlier. Indeed, recent weather patterns and rising sea levels indicate that the curve is likely to have already reached its tipping point as many scientists warned—and our best bet now is to act aggressively to prevent further environmental collapse and figure out peaceful ways of equitably distributing increasingly limited resources.

An understanding of reinforcing feedback can lead foundations, nonprofit leaders, and policy makers to:

- Cultivate the patience to build engines of growth slowly.
- Make decisions based on underlying systems structure instead of trends.
- Break potential vicious cycles quickly.

## BALANCING FEEDBACK: THE STORY OF CORRECTION

While the processes of growth and decay might be obvious to many, the dynamics of stability and equilibrium are often dominant and even more difficult to discern. Balancing loops are the driver for improving a social system—we seek to bridge the gap between a current and desired condition—and the key to understanding a system's resistance to change, because the current system is in equilibrium around goals it is already achieving.

We recognize balancing feedback in our daily experience, for example through a thermostat that regulates room temperature at 68°F, or in our own tendencies to sweat or shiver to maintain an internal body temperature of 98.6°F. In contrast with reinforcing feedback loops, which *amplify* an existing condition, balancing feedback seeks to *correct* or reverse a current state by bridging the gap between actual and desired performance. For example, a foundation might fund a mentoring program between older and younger students to improve graduation rates or a counseling program to reduce teen pregnancy. When balancing feedback accomplishes a desired goal, the corrective process often becomes invisible. When we eat enough food or get enough sleep, we tend to take these functions for granted.

By contrast, we are more aware of balancing processes when a system is *not* accomplishing the goal we state for it. In other words, balancing feedback also helps explain why systems do not change despite people's

best efforts to improve them. Simple corrective processes fail to function as intended in at least one of three ways.

First, we often stop investing in the solution once a problem appears solved. This act of "taking the pressure off" often leads the problem to recur—much to the frustration of the problem solvers. For example, urban youth crime in Boston was a serious problem in the early 1990s. Political and community leaders banded together to develop numerous coordinated solutions in response—from community policing and neighborhood watches to gang outreach and after-school programs. When youth crime declined as a result, political leaders felt obligated to shift funds to more obviously pressing problems. As a result, they gradually began to cut back on the crime prevention programs that worked so well, and the problem returned.[8]

The second tendency is to fail to appreciate the time required to effect change. For example, a recent success story on curbing teen drinking and substance abuse in one Massachusetts community of forty-six thousand, where adults also exhibited above-average rates of alcohol and drug abuse, described how coordinated improvements had gradually taken hold over a period of eleven years.[9] Such patience and persistence are rare. Normal reactions in the face of time delay are either to become impatient and push for premature results or to give up too quickly.

The third way in which balancing loops can fail to correct an existing situation is when there is lack of agreement on the goals of the system, the current level of performance and what drives it, or both. For example, a report sponsored by the Ball Foundation noted there was no lack of educational innovation in selected US schools and school districts.[10] However, educators seeking to disseminate these innovations on a broader scale were confronted by serious disagreements about both the goals of K–12 education and current performance levels. Some school districts defined their goals in terms of test scores, while others viewed graduation, subsequent employment, or the motivation and capacity for continuous learning as the desired result. Similarly, these school districts measured actual performance differently in terms of test scores, how children performed after graduation, and indicators of creativity and self-directed learning. It is very difficult to define and disseminate a particular strategy when the desired future, system goals, and/or perceptions of current conditions are ambiguous or conflicted.

By understanding ineffective balancing loops, funders, nonprofit leaders, and policy makers can:

- Ensure that effective solutions are reinforced and sustained over time instead of reduced when the pressure decreases.
- Respect time delays by being patient and persistent with social investments.
- Establish a clear and compelling shared vision, joint goals, and a common understanding of current reality before developing strategy. This is the basis for the change model to be introduced in chapter 5.

Figure 4.3 summarizes the core elements of a systems story.

## The Plots Thicken

Most complex problems arise from combinations of two or more reinforcing and/or balancing feedback processes. The good news is that we can gain preliminary insight into a wide range of dynamics by becoming familiar with ten of these system archetypes or classic stories. The archetypes are well understood, easily transferable across different system contexts, and often serve as catalysts for discerning even more complex dynamics.[11] This section describes five in greater detail since they illuminate so many problems in social systems, and introduces five more that are helpful to recognize.

### FIXES THAT BACKFIRE

Fixes That Backfire is the story of unintended consequences. Figure 4.4 shows the core dynamic of Fixes That Backfire and the pattern of behavior that arises from it. People implement a quick fix to reduce a problem symptom that works in the short run (B1 in figure 4.4); however, the quick fix also creates long-term unintended consequences that exacerbate the problem symptom over time (R2 in figure 4.4). Moreover, people do not recognize these negative consequences as deriving from the quick fix because of the time delay. Therefore, when the symptom returns they incorrectly assume that the solution is to implement *more* of the quick fix. They think, "It worked the first time; we just didn't do enough of it." When they return

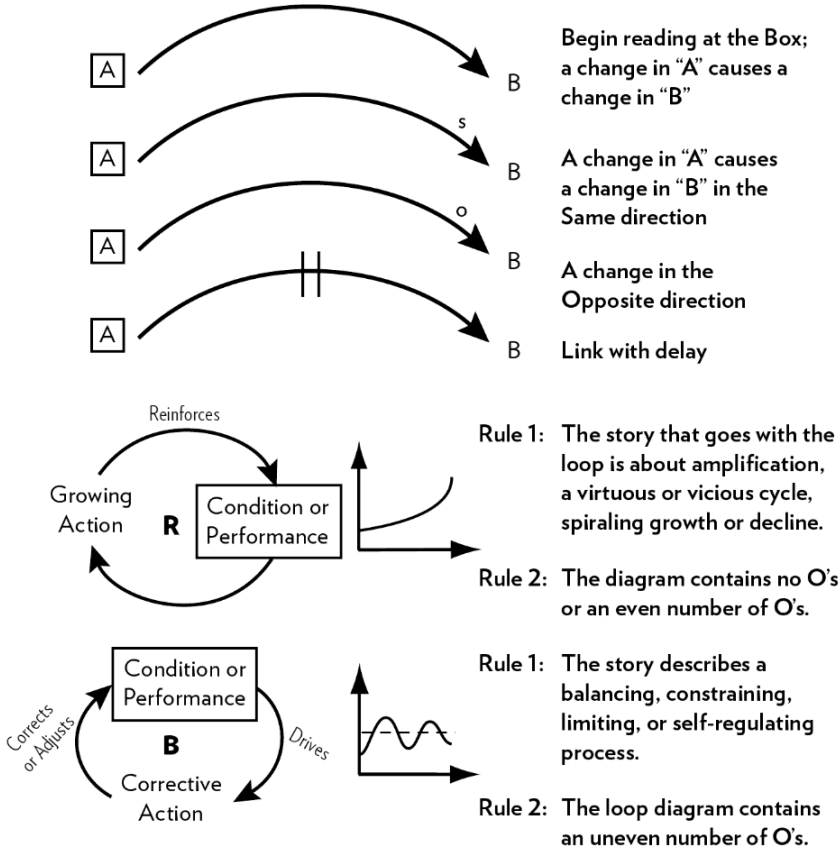



**FIGURE 4.3 CORE ELEMENTS OF A SYSTEMS STORY.** Systems stories are made up of circular cause–effect relationships among variables that change over time. Innovation Associates Organizational Learning

to the quick fix, the cycle repeats itself: short-term gains undermined by long-term negative consequences.

What does a Fix That Backfires look like in practice? Let's return to the TAPI case. The fix of harsh prison sentences reduced crime and the fear of crime in the short run. However, over time prisoners were released, often hardened by their experience or unprepared and legally restricted in their abilities to become productive members of society. On average across the nation, nearly half of formerly incarcerated people succumb to the pressures to commit another crime in the first three years or are sent back to prison

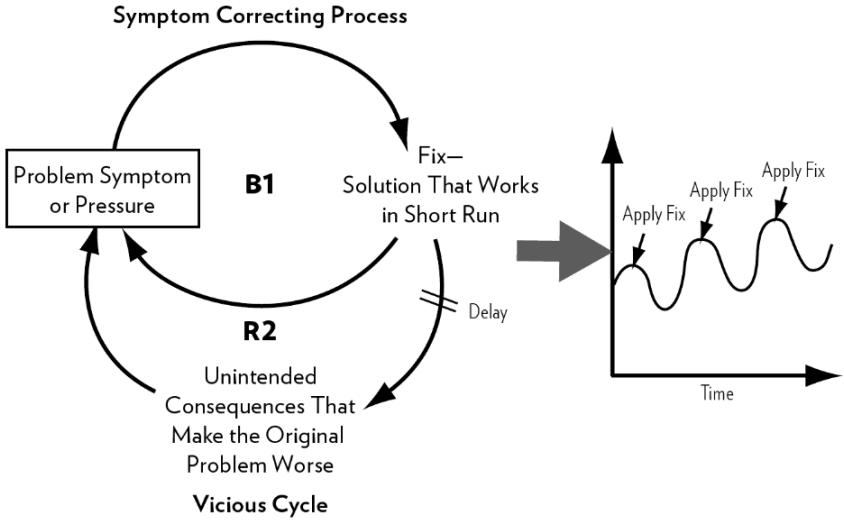



**FIGURE 4.4 FIXES THAT BACKFIRE.** Fixes That Backfire is the story of a quick fix producing unintended consequences that gradually make a problem symptom worse over time. Innovation Associates Organizational Learning

for parole violations. In a related example, drug busts take criminals off the street and thus reduce drug-related crime in the short run. However, they also remove drugs from circulation, thereby increasing drug prices and requiring addicts to steal more to pay for reduced supplies in the long run.[12]

In health care, as costs of care increase, there is pressure to reduce the length of hospital stays. However, people are often sent home too early and must be readmitted, thereby increasing costs of care even further.

In her book *The Crisis Caravan*, journalist Linda Polman cites the numerous problems created by well-intentioned funding sent by nonprofits and wealthier countries to relieve the devastation caused by civil war in poor countries. The relief aid, however well meaning, produces several unintended consequences that exacerbate these humanitarian disasters over time: Fighters in the war become healthier and more able to continue fighting, aid supplies are hijacked by despots or elites seeking to maintain power, and cynical leaders manufacture additional disasters to receive more aid. In addition, the funding provided for relief creates a market for relief organizations that come to compete with one another for more funding.[13]

Another type of relief aid, sending food to people suffering from starvation caused by either human-made or natural disasters, backfires in a different way. The people who benefit the most from food aid are children. Because they survive, they are able to reach childbearing age themselves. Countries receiving food aid then face another spike in population growth and starvation ten to fifteen years after they received the aid.

Cases such as relief and food aid are particularly powerful in raising a poignant and difficult challenge faced by people who want to do good. While there are things people can do to ease others' suffering in the short term, these solutions could make things worse over time. It is incumbent on people who want to help to think through and mitigate the possible unintended consequences of their actions.

Typical keys to overcoming the tendency toward Fixes That Backfire include: questioning the wisdom of the quick fix, identifying an alternative response, or mitigating the negative consequences of the fix if no alternative can be found. Additional possibilities will be covered in chapter 10.

## SHIFTING THE BURDEN

In many cases the best way to reduce the likelihood of Fixes That Backfire is to solve the underlying problem that produces the symptoms. People often recognize that a more fundamental solution is desirable, but then wonder why it is so difficult to implement. One of the key reasons is that addressing the root cause of the problem takes longer, is more expensive, and can entail more risk and uncertainty.

This pull between implementing a quick fix and aiming for a more fundamental solution lies at the heart of the so-called philanthropic challenge: Do we fix the problem now or help people over time? In systems terms, depending on the quick fix is known as Shifting the Burden, which produces a similar pattern of behavior as Fixes That Backfire: Intermittent reductions of the problem symptom mask a gradual worsening of the problem. However, there are several important differences:

- In Shifting the Burden people generally know what the more fundamental solution is, but they cannot generate the motivation and investments required to implement it. By contrast, there is no

clear fundamental solution to the problem symptom in Fixes That Backfire, and so a quick fix seems like the only possible response.

- In the short run the success of the quick fix, which is the obvious and easier of the two alternatives, creates temporary improvement in the symptom, which in turn undermines people's motivation to implement the more fundamental solution.
- In the long run implementing the quick fix produces unintended consequences that actually undermine people's ability to implement the fundamental solution even if they want to. One common way in which this ability is reduced is that the quick fix consumes resources (people, time, money) that would otherwise be available to solve the problem more permanently.
- As a result people come to depend more and more on the quick fix over time, and invest less and less in the core solution. This growing dependence on the quick fix is also known as addiction. Despite their better judgment, people become addicted to the quick fix.

The systems structure and resulting pattern of behavior are shown in figure 4.5. The top loop (B1) shows the quick fix, while the bottom loop (B2) shows the fundamental solution. B2 is virtual in the sense that it should be activated by the problem symptom but is not; instead the symptom is mitigated by the quick fix to the extent that people do not feel sufficiently motivated to implement a solution that tends to be longer-term and more costly. The combination of B1 and B2 form a vicious cycle that increases use of the quick fix over time while decreasing incentive to use the fundamental solution. The R3 loop on the side shows that increasing use of the quick fix creates side effects that actually decrease the system's ability to implement the fundamental solution over time, thereby exacerbating the problem symptom even further.

The food aid and TAPI cases are examples of both Shifting the Burden and Fixes That Backfire. With respect to food aid, there is a general understanding in the development community that the fundamental solution to starvation is strong local agriculture. However, receiving food aid undermines motivation to develop local infrastructure. In addition the free food

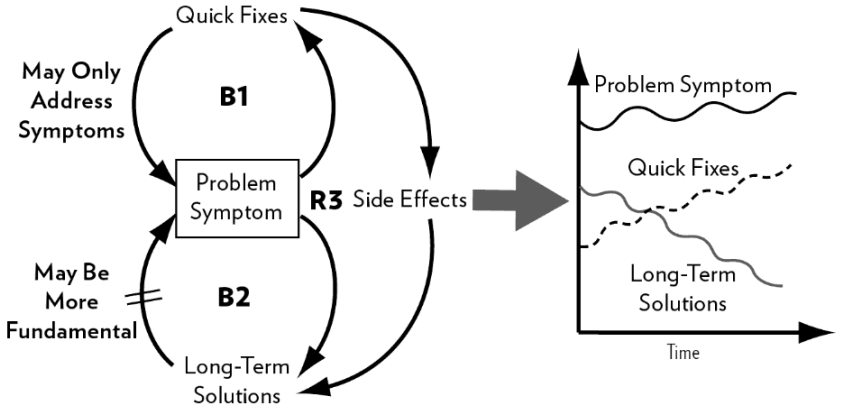



**FIGURE 4.5 SHIFTING THE BURDEN.** Shifting the Burden is the story of unintended dependency on a quick fix that reduces people's willingness and ability to implement a more fundamental solution. Innovation Associates Organizational Learning

drives down local food prices and makes it difficult for farmers to grow and distribute food profitably, thereby weakening local agriculture even further.

When it comes to criminal justice reform, get-tough prison sentences lead public officials and ordinary citizens to believe that the crime problem has been addressed, thus reducing their motivation to invest in alternative means of solving it. These sentences get offenders off the street, but the burden is shifted when, upon release, formerly incarcerated people are *less* able to do the hard work of resettlement. In addition, the high costs of our current penal system reduce funding for community development and resettlement programs that would reduce crime and the fear of crime in more sustainable ways. Failing to invest sufficiently in community development and resettlement initiatives increases the possibility of crime and its accompanying fears.

In health care, it is common to invest more in treating illness than in preventing it or improving overall health. The long-term consequence of this investment is that there is less money available for influencing the underlying factors that shape good health in the first place.

There are also examples of quick fixes that undermine fundamental solutions to be found in international development. William Easterly, a professor of economics and co-director of the award-winning NYU Development Research Institute, challenges people who are committed

to relieving poverty in developing countries to be wary of supporting technocratic solutions implemented by autocrats.[14] He demonstrates that bottom-up development by mostly small actors is much more effective. While top-down technocratic solutions may provide temporary relief for poor people, or at least the appearance of relief, it also takes funds away from the more fundamental solution.[15]

The Shifting the Burden model plays out in the realm of corporate sustainability as well. As John Ehrenfeld, the executive director of the International Society for Industrial Ecology, explains, "Eco-efficiency, or delivering more value for less environmental burden, has been touted as the primary instrument for achieving sustainability. So has socially responsible investing . . . The problem is that none of this espoused benevolence creates true sustainability. At best, it only temporarily slows society's continuing drift toward unsustainability; at worst, it serves as feel-good marketing for products and services that in fact degrade and pollute our environment and fail to meaningfully satisfy the needs of consumers."[16] Ehrenfeld distinguishes between what he sees as the quick fix of supporting more efficient consumption and a fundamental solution that changes the prevailing consumption-driven economic model to one that emphasizes the nonmaterial factors driving quality of life and does not depend on resource-depleting products to create satisfaction.

Peter Buffett, one of the sons of Warren Buffett and chairman of the NoVo Foundation, also calls for redefining the quality of life when he challenges what he calls "philanthropic colonialism."[17] He points out that growing the nonprofit sector is a quick fix to the problem of income inequality because it distracts donors from the deeper work of developing a more humanistic approach to capitalism. Buffet questions the logic of increasing poor people's capacity to consume at the expense of creating a more meaningful experience of prosperity for all. The unintended consequence of depending on the nonprofit sector to solve social problems is that philanthropically minded public- and private-sector leaders can justify what they have earned through a structure that concentrates wealth in their hands by giving some of that wealth back to the poor without challenging the system of inequality itself.

Keys to overcoming the tendency toward Shifting the Burden include: questioning the wisdom of the quick fix, challenging assumptions that discourage investment in the fundamental solution, and establishing a