

A Systemic Framework for Understanding the Dynamics of Rural Communities in America

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Preface

This manuscript describes a basic, multi-level framework for mapping the system of factors and mechanisms that most influence positive and negative outcomes in rural communities. We use a series of examples to demonstrate how the framework works, how it can be used to help illuminate a community's dynamic processes of change, and how it can help assess the potential impact of alternative interventions. We conclude with a discussion of policy implications for decisionmakers at the local, state, and federal level and outline a broad research agenda for those wishing to further explore this domain.

This report is funded by RAND internal funds. The goal of the conceptual frameworks described in this manuscript are to provide lenses or "frames" through which we can better investigate how rural communities evolve over time. We see this framework as a tool to help us ask interesting and thoughtful questions and to better engage in comprehensive and systemic discussion of change.

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Abstract

The rhetoric in the 2017 election laid bare a growing social, economic, and political gulf between “rural” and “urban” America. Some rural communities have been advantaged by global economic, demographic and technological trends and have thrived over the last several decades while others have stagnated and begun to decay. These disparities have pervasive negative consequences that deeply impact many rural areas: the opioid epidemic, rising rural unemployment and poverty, and dangerous discourse across racial, national, and class lines. Although both the popular and academic literature offer important insights into the many influential and overlapping factors that contribute to these problems, there is no comprehensive understanding of how all the mechanisms fit together as a larger system.

To address these issues, this manuscript describes a basic, multi-level framework for mapping the system of factors and mechanisms that most influence positive and negative outcomes in rural communities. We use a series of examples to demonstrate how the framework works, how it can be used to help illuminate a community’s dynamic processes of change, and how it can help assess the potential impact of alternative interventions. We conclude with a discussion of policy implications for decisionmakers at the local, state, and federal level and outline a broad research agenda for those wishing to further explore this domain.

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Introduction

The rhetoric in the 2016 election laid bare a growing social, economic, and political gulf between “rural” and “urban” America. Some rural communities have been advantaged by global economic, demographic and technological trends and have thrived over the last several decades while others have stagnated and begun to decay. The most affected communities have seen significant differences in outcomes for population growth (USDA 2019a), economic growth, employment (USDA 2019b), educational attainment (Koricich et al. 2018), health outcomes (CDC 2017), and rates of poverty (USDA 2019c). These disparities have pervasive negative consequences that deeply impact many rural areas: the opioid epidemic, rising rural unemployment and poverty, and dangerous discourse across racial, national, and class lines. Although both the popular and academic literature offer important insights into the many influential and overlapping factors that contribute to these problems, there is no comprehensive understanding of how all the mechanisms fit together as a larger system.

To address these issues, this manuscript describes a basic, multi-level framework for mapping the system of factors and mechanisms that most influence positive and negative outcomes in rural communities. We use a series of examples to demonstrate how the framework works, how it can be used to help illuminate a community’s dynamic processes of change, and how it can help assess the potential impact of alternative interventions. We conclude with a discussion of policy implications for decisionmakers at the local, state, and federal level and outline a broad research agenda for those wishing to further explore this domain.

Background

Urbanization, globalization, and other population-wide trends have disproportionately harmed and inequitably benefited rural communities of the United States, which are often characterized as “left behind” in political rhetoric. The challenge from a policy perspective is that these disparities come in many forms and are entangled in all aspects of social life. The stories of struggling communities in the Rust Belt are similar to – yet distinct from – the stories in the Northeast, the South, and the Northwest. Some small towns have prospered, and other small cities have fallen on hard times. In short, the problems impacting rural America are complex, multi-sectoral, and varied and must be considered from multidisciplinary perspectives and fields.

Much has been written on rural societies in both the academic and popular press. The academic literature has helped improve understanding of general trends using national-level statistics but have often masked important sources of variation at the local level. Rural sociologists, economists, political scientists, anthropologists and other academics have used their tools and unique disciplinary lenses to provide important insights into how changes have affected specific sectors of rural communities (i.e., employment, education, health, etc.). These sector and disciplinary foci generate in-depth and nuanced understandings of specific aspects of rural America, but their more-limited scope often leads to somewhat siloed and disjointed understandings of the larger, more complex system.

In contrast, journalistic articles and ethnographic studies typically have focused on a more grassroots level and have described the history and experiences of specific communities, households, and individuals (Vance 2016). These detailed depictions have often provided insights into how multiple sectors interacted and how changes at one level affected communities, businesses, households, and individuals at levels below. Some of these works have described examples of communities in decay (e.g., MacGillis, 2018; McCoy 2017). Others have described more encouraging examples of communities or regions that have either adapted or have managed to persevere in ways that other areas and communities have not (Fallows and Fallows 2018).

The downside of these individual exemplars is that it is difficult to assess to what degree the findings are generalizable to the larger rural areas or communities. There is, however, a growing body of literature that take a more systemic approach to rural dynamics and tries to describe the complex interactions across sectors (e.g., manufacturing, retail, education, health, etc.) and across levels (e.g., individuals, households, communities, regions, etc.). One approach is more area or regionally-focused while the other examines individual communities.

Regionally-focused approaches

Regionally-focused approaches tend to utilize more formal quantitative modelling techniques and draw on county or regional-level data that are more readily available to researchers. Exemplars of this approach include the Socio-Economic Benefits Assessment System (SEBAS) (Robinson and Liu, 2006; Robinson and Johnson 2005, Johnson et al. 2010) and Toward a Policy Model of Multifunctional Agriculture and Rural Development (TOP-MARD) (Bryden, et al., 2008; Bryden and Refsgaard, 2009; Refsgaard and Johnson, 2010). SEBAS was funded by United States Department of Agriculture's (USDA) and was developed as a tool to evaluate the economic and social impacts of the department's Rural Development grant and loan programs. TOP-MARD was a project funded by the European Union to produce economic simulation models for examining different policies on rural development outcomes. Both approaches were designed to address agricultural-related issues, and therefore, the agricultural sector is central to their conception.

Community-focused approaches

Community-focused approaches tend to examine what constitutes a community as healthy or unhealthy. Analysts would characterize a community as unhealthy if measures of some negative outcomes (such as teen pregnancy or drug overdoses) are high relative to other communities, and measures of some positive outcomes (such as high school graduation or median family income) are relatively low. However, when it comes to communities, the absence of notable unhealthiness is not necessarily the same as health. Establishing clarity on the meaning of "the health of a community" is an active area of investigation and debate (Goodman et al. 2014).

One conception of community health that has gained some favor of late, especially among those who practice and research international development, is *community resilience* (Norris et al., 2008; Berkes and Ross 2013). Community resilience focuses attention on the ability of a

community to respond effectively to various hardships, but it means much more than emergency preparedness (Chandra et al., 2011, 2013; Eisenman et al., 2014). The hardships faced by communities can be driven by human activity (such as an economic downturn) or nature (such as an extreme weather event). They can be sudden shocks or more gradual stressors, and multiple hardships can occur simultaneously or in close succession, with impacts that combine in non-linear ways. The concept of community resilience acknowledges the inevitability of such hardships but not the inevitability of their most damaging consequences.

Although there is no agreed-upon, standard definition, RAND colleagues define community resilience as “a measure of the sustained ability of a community to utilize available resources to respond to, withstand, and recover from adverse situations (RAND Corporation, 2019).” The concept often emphasizes adaptation in the face of obstacles or crises. In its report on Investing in Urban Resilience, the World Bank defines resilience as “the ability of a system, entity, community, or person to adapt to a variety of changing conditions and to withstand shocks while still maintaining its essential functions (World Bank 2015:12).” As characterized by 100ResilientCities, which is sponsored by The Rockefeller Foundation, resilience means more than the ability to withstand a threat: Resilience affords adaptation in the face of challenges of all types. It also addresses all components of a community, from the individual to the system level, in both the public and private sectors. To wit, *100ResilientCities* defines urban resilience as “the capacity of individuals, communities, institutions, business, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience (100ResilientCities, 2019).”

Another community-focused approach is based on a reasonable belief that healthy communities demonstrate various types of capital or wealth. This approach is based on the foundational work of Emery and Flora’s *community capitals framework* (Castle 1998; Flora, Emery et al. 2004; Flora 2018). The rural wealth approach has a long history and multiple variations (Pender et al., 2012; Pender et al., 2014; Polansky et al. 2015), including the *Comprehensive Rural Wealth Framework* utilized by the Rural Policy Research Institute’s (RUPRI) (Rural Policy Research Institute 2018). In RUPRI’s version, there are eight types of wealth that are accumulated in a community and necessary for prosperity and growth. This list includes: physical, financial, human, intellectual, political, natural, social and cultural capital. The Rural Policy Research Institute provides the following descriptions for each:

1. *Physical capital* is the stock of “built capital,” including equipment, buildings, roads, bridges, telecommunications networks, and other types of physical infrastructure.
2. *Financial capital* is the stock of money and other liquid financial assets such as stocks, bonds, and letters of credit—net of financial liabilities—that can be readily converted to money.
3. *Human capital* is the stock of productive capabilities of a population embodied in the education, skills, talents, and health status of that population.
4. *Intellectual capital* is the stock of human knowledge, innovation, and ideas that is embedded throughout a society. This makes it different from the human capital embedded in individuals. Examples include various types of intellectual property such as patents and copyrights as well as “common knowledge.”

5. *Political capital* is the stock of influence, power, and goodwill held by individuals, groups, and organizations that can be held, spent, or shared to achieve specific goals.
6. *Natural capital* is the stock of resources provided by Mother Nature, including clean water, clean air, natural landscapes, the climate, forests, wildlife, land, flora, and fauna.
7. *Social capital* is the stock of trust, relationships, and networks found in our civil society. Social capital can be held by individuals or by groups and organizations.
8. *Cultural capital* is the stock of practices, values, and sense of identity embedded in a society. Cultural capital is held by individuals and groups. Tangible examples include works of art, architecture, and places of cultural significance such as monuments. Intangible examples include beliefs, traditions, and practices that distinguish and identify groups of people and their values and identity (Rural Policy Research Institute 2018: p. 2).

Both resiliency and community wealth represent reserves and resources on which communities can draw to grow and to respond to downturns and emergencies. Like fever and blood pressure in the human body, community wealth and resiliency are *emergent properties* in that they *emerge* from multiple underlying mechanisms. They are useful (but often imprecise) measures for assessing the overall health of a community and can be utilized to indicate potential problems (Fey et al., 2006). Without a clearer understanding of the underlying community dynamics, however, they tell us little about where and how to intervene to improve the status of one or several community wealth stocks or a further downstream characteristic like poverty. For that, we need a more thorough understanding of how communities work as complex, dynamic, living systems. Below, we try to take a first step in that direction by describing a systemic conceptual framework for understanding the dynamics of rural communities in America.

Conceptual Frameworks

Our objective in this project is to develop a conceptual framework that helps us better think systemically about how communities *work*. By *work*, we mean how do a community's key components interact with each other so that the community functions as a living whole, much as we would describe how a biological cell functions and what roles the cell membrane, nucleus, mitochondria, and other organelles play *vis a vis* each other. Just as it is essential for a drug manufacturer to understand cell dynamics to create a drug (a health intervention), we posit that designers of new policies and programs can greatly benefit from understanding the dynamics of communities and other systems where change is desired.

To us, conceptual frameworks are lenses or "frames" through which we can better investigate the world. We use them as tools to help us ask interesting and thoughtful questions about a phenomenon. Our understanding of conceptual frameworks resembles what early system analysts referred to as "*holons*" (Checkland and Scholes, 1990; Checkland 2000). *Holons* "were never models of real-world action; they were models relevant to discourse and argument about real-world action; they were epistemological devices that ... could structure

debate about different ways of seeing the situation (Checkland, 2000:S53).” As Checkland and Scholes (1990) note:

We engage the world by making use of concepts whose source is our experience of the world; this process of engagement, usually unconscious as we live everyday life, can be made explicit; one way of doing so is embodied in so-called ‘systems thinking’, based on the idea of making use of the concept of ‘a whole’. In systems thinking, accounts of wholes are formulated as holons, and these can be set against the perceived world in order to learn about it (Checkland and Scholes, 1990:23).

Although our methodological approach is based on our past experiences developing conceptual frameworks, it strongly resembles the “soft system methodology” (Checkland and Scholes, 1990; Wang et al. 2015; Warren et al., 2019) and human factors methods (Stanton et al., 2017) used by system engineers. For a fuller description of the steps we took to develop our conceptual framework, see Appendix 1.)

A General Conceptual Framework for Understanding Rural Communities

We begin by recognizing that no two communities are alike. For example, each community:

- Is situated in its own geographic context – some are built along a river, lake or coast while others are nestled among mountains or located on open plains or deserts.
- Has its own economic engine – some center on agriculture, some on extraction industries (mining, timber, fishing), some on manufacturing, some on tourism, and some on a mix. In other cases, some are bedroom communities with the economic engine located elsewhere, and some rely heavily on government transfers.
- Has its own demographic characteristics including size and composition– some have homogeneous populations, some are skewed to older or older populations, and others are more diverse in terms of age, education, race and ethnicity, income, health and personal interests and preferences.
- Exhibits its own pattern of dispersion – some have a well-defined center with surrounding neighborhoods, while others are more disaggregated and sprawl across the landscape.
- Has its own social fabric – some are more segregated in terms of how different types of residents and households interact with each while others are more intermixed across ethnic and class lines.
- Resides in a distinct local and regional space – some are near metropolitan areas, some are close to other small communities or small cities, while others may be more isolated.
- Has its own lifecycle – each community is founded and develops and matures. Some communities eventually lose their populations and die. Where existing communities are in their lifecycle is difficult to determine. Some continue to grow and expand demographically and economically while others are in states of decline.

Despite the variation from one community to another, however, all communities share a set of key components and relationships. Internally, each community consists of a physical and social space in which individuals, households and a diverse set of public, private and civil organizations interact with each other. Externally, each community is also embedded in a larger physical and social space that includes nearby and regional networks of other communities both small and large. This larger context affects the community just as, in turn, the community affects its surroundings.

To better understand how a community functions, we find it useful to compare a community to a living, biological cell. Like a cell, a community: (a) is defined by a clearly delineated (but permeable) boundary; (b) consists of key components with specialized roles that interact with each other through various types of exchanges and interactions; (c) has an internal environment that facilitates (or inhibits) such exchanges and interactions both within and across a community's boundaries; and (d) exists in a larger physical and geographic environment as well as an environment populated with other kinds of similar entities. Most important, like a cell, the degree to which a community thrives or decays depends not only on the success of individuals, households and organizations but also on the quality of the exchanges between them that link the community together as a coherent but adaptive whole. With this metaphor in mind, we have sketched out a new framework for understanding communities and their evolving dynamics, which is described below.

Individuals, households and organizations

There are three fundamental types of actors in any community – individuals, households and organizations. Individuals are the simplest kind of actor and have volition in and of themselves. To satisfy basic physiological requirements (e.g., water, food, shelter) and social requirements (e.g., child rearing, elder care, etc.), however, individuals live in “households” that allow them to efficiently meet these basic needs. Households typically emerge out of the interplay among a small group of individuals that live in a shared physical space. While households form the domestic core of a community, organizations form its economy by generating most of the jobs and goods and services that individuals and households need or desire. Like households, organizations (both business-oriented and social-oriented) exist in a symbiotic relationship with individuals and can't survive without them. Like households, organizations are more than the sum of their individual owners, managers and employees, but rather organizations emerge as independent social actors from the dynamic self-organization of the individuals that live and work within their boundaries.

It is the complex interplay between these three types of actors that cause communities to be born, grow, adapt and, in some cases, decay over time. Below we explore the dynamic parts of each actor and how they interact.

Individuals

To us, all individuals come with two fundamental capacities: (a) their knowledge, skills, and abilities; and (b) their physical and mental health. For simplicity's sake, we refer to these capacities as *labor capacity* and *health capacity*. (Note that *labor capacity* is sometimes called

human capital, particularly when it is aggregated to a population level such as a community in the wealth framework above.) These capacities are critical in determining the different kinds of roles that individuals play in society. Although there is wide variation in each type of capacity, they can be generally described along a relatively simple continuum. Table 1 breaks each into a three-point ordinal scale and shows how the two capacities interact with each other.

Labor capacity (as we define it) can be broken into three crude categories: (1) intellectual and physical capacities that allow adults to work at high-skill jobs; (2) intellectual and physical capacities that limit adults to working only at low-skilled professions; and (3) lack of intellectual and physical capacities that prevent individuals from nearly all types of employment and who depend on others for basic needs. One short-hand for this continuum would be: working-age adults with at least some college or professional education; working-age adults with a high school education or less; and children, intellectually disabled working-age adults, or the most elderly members of the community. Note, when we talk about labor capacity we are referring only to the capacity inherent within an individual, not to the actual job they currently hold.

Health capacity (as defined here) can also be broken into three crude categories: (1) sufficient physical and mental capacities that allow individuals to function normally on a day-by-day basis in society; (2) temporary reductions in physical or mental function that either prevents individuals from performing their normal roles or that require some kind of medical attention, support or intervention; and (3) serious, long-term physical or mental disabilities that prevent individuals from performing the normal roles that would be expected of them. Another way to measure health capacity would be to categorize people based on those who were healthy and functional; those who were temporarily ill and/or partially functional; and those who were permanently disabled.

Table 1 shows how labor and health capacities interact within the same individual. For example, a healthy adult who can work at a high-skilled job would represent someone with the highest health and labor capacities. In contrast, a disabled adult or dependent child who requires ongoing medical care and who also requires assistance at home would represent someone with the lowest health and labor capacities. Somewhere in the middle of the two continua is a person who only has a high school education and who is out sick with the flu. The amount of each capacity has significant implications for the opportunities and challenges that individuals may face at any moment in their lives.

Table 1. The relationship between labor and health capacities.

		Health Capacity		
		1 - Healthy and functional	2 - Temporarily ill and partially functional	3. Permanently disabled
Labor Capacity	1 - Adult capable of working with high-skills	Healthy adult who can work at a high-skilled job.	Adult who can work at a high-skilled job but who is temporarily ill. Illness may require medical attention and may result in lost work days.	Disabled adult who requires ongoing medical care but who remains capable of working at a high-skilled job
	2 - Adult capable of working with low-skills	Healthy adult who is only capable of working at a low-skilled job.	Adult who is only capable of working at a low-skilled job but who is temporarily ill. Illness may require medical attention and may result in lost work days.	Disabled adult who requires ongoing medical care but who remains capable of working at a low-skilled job
	3 - Child or dependent adult	Healthy child; or healthy adult with a mental disability that prevents them from being independent. Will require care at home.	Child who is temporarily ill. Illness may require medical attention and may result in absence from school or additional care at home.	Disabled adult or child who requires ongoing medical care and who also requires assistance at home.

Labor and health capacities are quite variable and are expected to change over a person's life. In general, however, labor capacity typically increases with age and with more education. People tend to naturally develop cognitively and physical capacities from birth through early adulthood. With more experiences and exposure to education, they also develop skills and intellectual capacity. It is only toward the end of life that labor capacity diminishes as the elderly find it more difficult to perform physical and mental tasks. In contrast, a person's health capacity may fluctuate significantly from day- to-day or from year-to-year. Accidents occur instantaneously; acute illness can arise and disappear in days or weeks; and chronic and disabling illnesses can come on suddenly or progress slowly or episodically over time. Some of

these events will have little to no impact on health capacity, while others will have devastating long-term effects.

Households

A household is the physical and social space in the community where people reside. Regardless if they live alone or in groups, all individuals live in households. Households include: (a) a physical place that provides shelter (e.g., a house, apartment, van, etc.); (b) household members (e.g., an individual, a couple, an extended family, a group of friends and the like); and (c) possessions (for example, cars, appliances, electronics, furnishings, kitchenware, clothing and linens). Households are created in two ways: (a) from existing community members forming new households; or (b) from households outside the community moving into the community. Household size increases when individuals from other households move into them or when individuals are born into them. Household size decreases when its members die and when individuals move out.

Households act as an economic unit in terms of producing commodities that generate well-being for members. They produce these commodities using their own time and goods as well as time and goods obtained through exchanges with organizations and other households (Becker 1965). Households and their members trade labor for income and trade income for goods and services (i.e., time of others). To allow for these exchanges, households need to acquire, store and allocate: (a) labor and health capacity; (b) income and wealth (e.g., savings, investments, goods, etc.), and time.

The labor and health capacity of a household is the sum of each member's capacity. The more adults and the more skilled they are, the more a household's labor capacity. Conversely, the more children and dependent adults, the less the labor capacity a household can expand. The same holds for health capacity. Not surprisingly, households often invest heavily in education and healthcare to increase the household's overall health or labor capacity (see below).

The wealth of a household comes in multiple forms. *Economic wealth* includes all the assets a household owns less the total amount of liabilities they owe (debt). Monetary assets such as unspent income and savings are the most liquid and are typically used to acquire goods and services required for a household's day-to-day needs. These kinds of funds are also more volatile and may fluctuate significantly from week-to-week and month-to-month. Personal assets (e.g., houses, cars, and other goods) and capital assets (e.g., real estate and other income-generating investments) are less liquid and more difficult for many households to accumulate. *Social wealth* refers to the value of a household's social network (i.e., who its members know). It is built through cooperative, trusting and reciprocal relationships between members of different households and provides households with all kinds of support and resources, from providing a helping hand or a warm meal, to offering a temporary place to stay or a sympathetic ear. Though less tangible than economic wealth, social wealth is highly flexible and adaptive – particularly in times of need or crisis – and is a critical asset for those with the least economic wealth.

Organizations

An organization is a social entity whose primary role in a community is to produce goods or services that others consume. Communities are filled with different organizational types, including: private manufacturers, retail businesses and service providers; public entities like city hall, schools, police and fire departments; and civic organizations such as faith-based organizations (FBOs), non-government agencies (NGOs) and community-based organizations (CBOs). Each play specific roles in a community depending on the types of goods and services they produce. All organizations, however, have: (a) a place from which they operate (e.g., factory, storefront, office, home, etc.); (b) key components needed for the creation of the goods or services being produced (e.g., inputs, capital, labor, etc.); (c) mechanisms for distributing the wealth generated or absorbing the wealth lost (e.g., for profit, not-for-profit); and (d) relationships with other organizations or households.

An organization grows and declines based on its capacity to produce goods and services. If there is strong demand for goods and services and the organization can acquire the needed capital, labor and inputs, it may expand its capacity. On the other hand, if an organization finds demand for its goods and services weakening, or if it becomes more difficult or expensive to acquire the needed capital, labor and other inputs it needs, it may reduce its capacity – sometime to the point of closing.

The individual-household-organizational interface

The two primary mechanisms through which individuals and organizations interact with each other are based on a cycle of employment and consumption exchanges (shown in Figure 1). Starting on the left of the figure, organizations require labor (both intellectual and physical) to function. To meet this need, organizations generate local employment opportunities which they hope to fill by employing individuals with the needed labor capacities. On the right side of the figure, individuals also have needs which they hope to fill through consuming the goods and services produced by organizations. The circular relationship between individuals and organizations is the lifeblood of all communities. Think of this cycle as the fundamental essence of a community – it is a community’s primary circulatory system. When the circulation is strong, a community thrives and grows. When the circulation begins to weaken, a community begins to decay.

Figure 1. Employment and consumption exchanges between individuals and organizations.

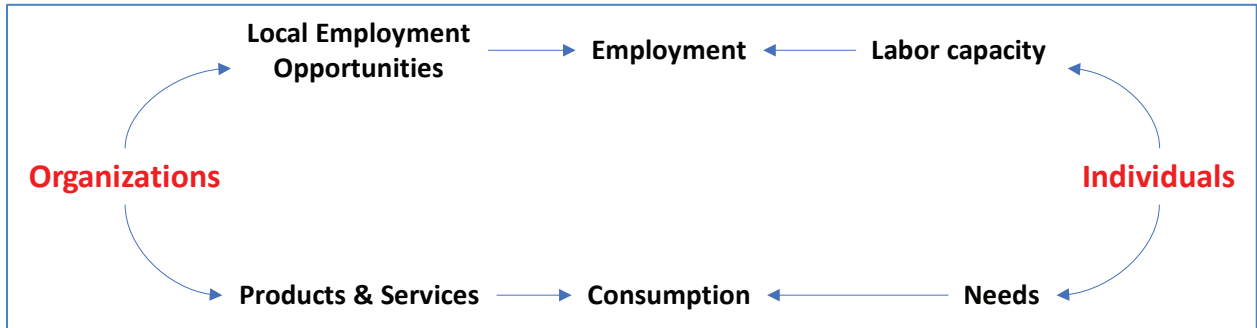
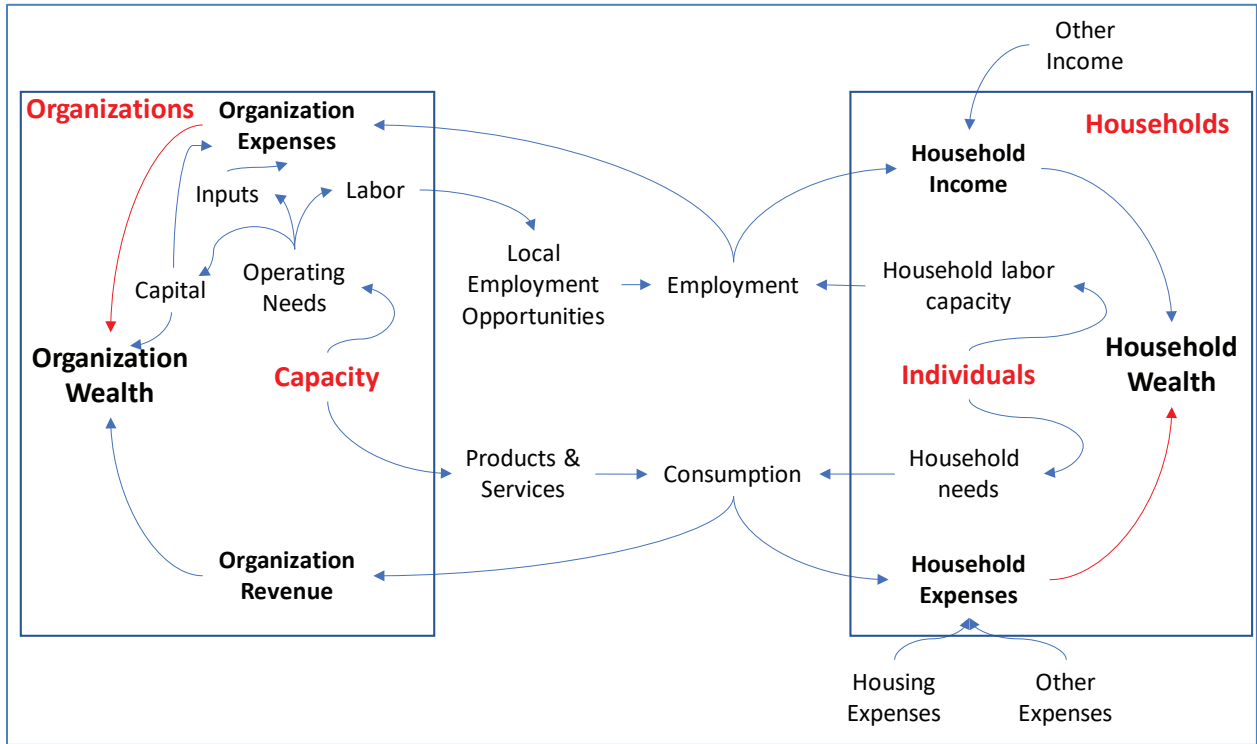


Figure 2 provides additional details on how the employment-consumption cycle plays out from the perspective of the household and organizations. On the right, individual members of a household generate household needs as well as provide household labor capacity. The labor capacity is exchanged for employment which generates income that contributes to a household's wealth. Household needs are met through consumption of products and services that contribute (along with housing and other costs) to the total expenses of the household. Total household wealth can be seen as a crude measure of household resiliency. When household wealth is growing (e.g., where household income is greater than household expenses), households become less vulnerable to adverse changes in their environment. When household wealth is declining (e.g., where household income is less than household expenses), households become more vulnerable to changes in their environment.

Figure 2 also shows how organizations interact with the larger community system. On the left, we see that for an organization to maintain its production capacity, it must meet its operating needs. This is accomplished through inputs (e.g., materials, supplies, etc.), capital (e.g., land, buildings, technology, financing, etc.) and labor (e.g., intellectual and manual). Each of these contributes to an organization's operating expenses. Organizational revenue is produced through the consumption of the products and services that the organization produces. Organizational wealth consists of the capital the organization owns plus the difference between the organization's revenue and its expenses (i.e., profit).

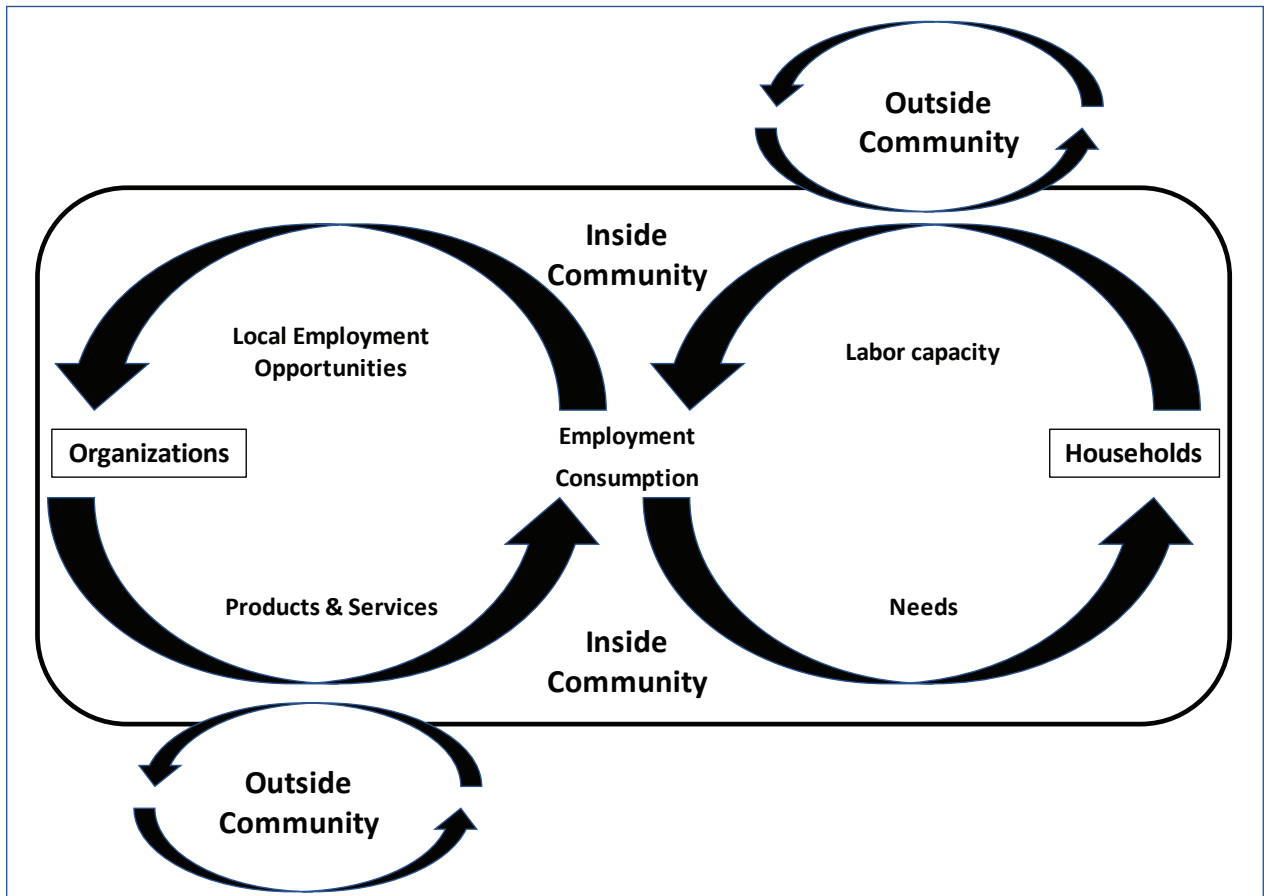
Figure 2. Interactions among organizations and households in a larger community.



Legend: Blue arrows indicate positive relationships – as one increases the other increases. Red arrows indicate negative relationships – as one increases, the other decreases.

Figure 3 illustrates a simple way to understand community dynamics. A community consists of two types of co-dependent social entities: households and organizations. Households and organizations interact with each other in complex ways, all within a larger physical and social context. Key types of interactions include: organization-organization, household-household, and household-organization. The social and physical context is dynamic in that it emerges out of these interactions and simultaneously influences the interactions. Figure 3 also shows that organizations and households inside a community also have connections and interact with households and organizations outside of the community. We explore these types of relationships in more detail below.

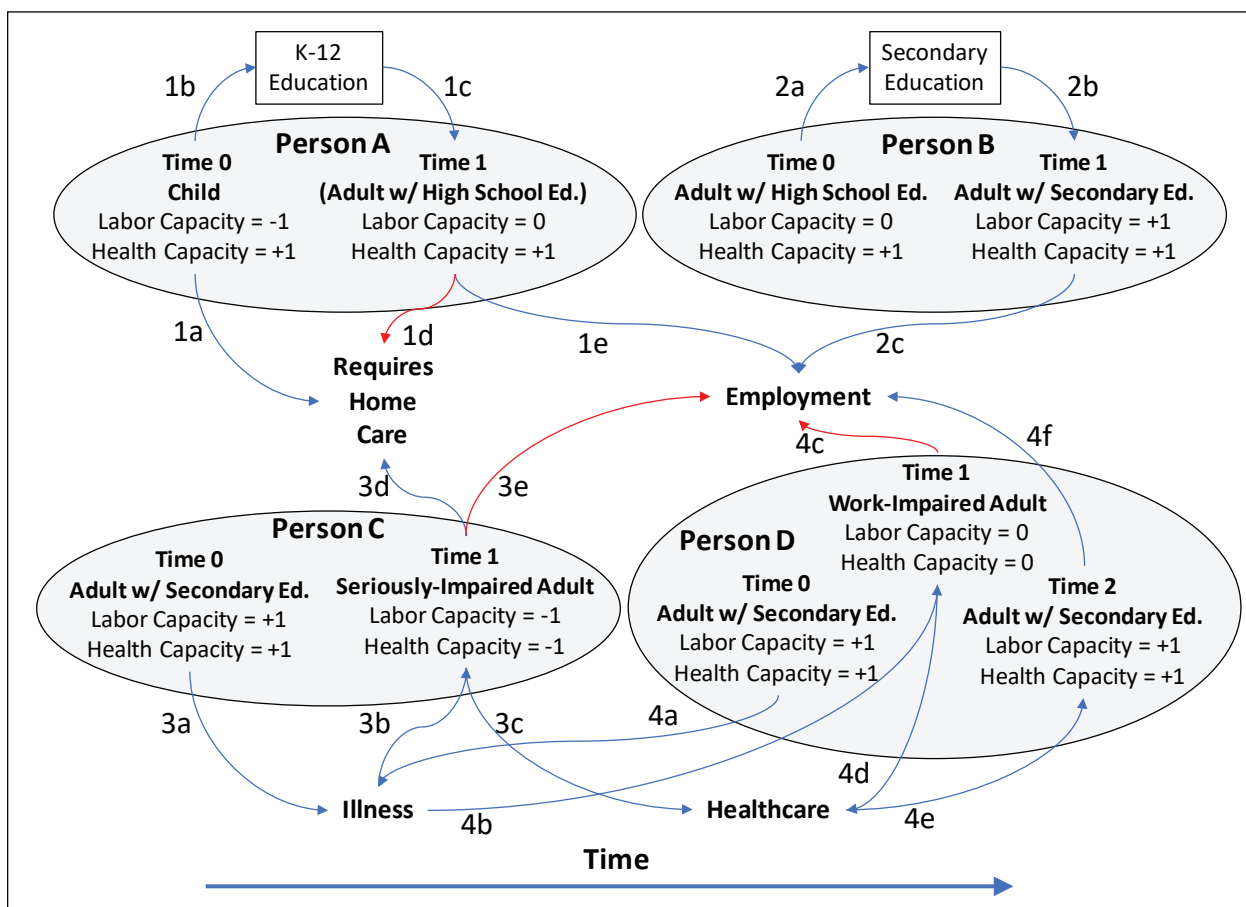
Figure 3. Inside and outside community dynamics.



Key household dynamics

To understand the fundamental exchanges within a household, it is worth considering the household’s demographic composition, as well as how labor and health capacities are intricately linked to education (primary and secondary), employment, illness, healthcare and a household’s basic needs. Figure 4 illustrates some of the key relationships by tracing the changing capacities of four individuals (Persons A-D). Let’s start with Person A – a healthy child. At Time 0, the child lacks independence (labor capacity = -1) and requires someone to care for them at home (1a). After completing a K-12 education (1b), however, the child becomes independent (1c) with a high school diploma (labor capacity = 0) and is more likely to be employed (1e). Secondary education has similar effect of increasing a person’s labor capacity. Person B is an independent adult with a high school education (labor capacity = 0) who obtains a secondary education (2a). After completing the degree (2b), the person’s labor capacity increases from 0 (the equivalent of a high school level education) to +1 (the equivalent of a college-level education). The increased capacity further increases their potential to acquire a higher paying job (2c).

Figure 4. Examples of how individuals' labor and health capacity can change over time.



Legend: Blue arrows indicate positive relationships – as one increases the other increases. Red arrows indicate negative relationships – as one increases, the other decreases.

Persons C and D illustrate the effects of illness and health capacity on labor and home care. At Time 0, Person C is a healthy adult (health capacity +1) with a college-level education (labor capacity = +1) when they become ill (3a). The illness is debilitating (health capacity = -1) that will require continuous interactions with the health care (3c) for years to come. Furthermore, their disability has also stripped them of their ability to care for themselves (labor capacity = -1) and like Person A, will require assistance at home (3d) and be unable to work (3e). Like Person C, Person D at Time 0, is a healthy individual with a college level education who also becomes ill (4a). The illness, however, is less severe (4b). The illness debilitates Person D just enough (health capacity = 0) so they miss work (4c) but are still able to function independently (labor capacity = 0). To recover, they seek medical care (4d), which returns them to normal health (health capacity = +1). Once they feel better, they return to work (4f). The simple examples in Figure 4 makes it clear how important it is for households to have access to education (both K-12 and secondary educational opportunities) as well as healthcare for all its members. Education provides an efficient way to improve household labor capacity and healthcare

reduces the household illness burden.

Figure 5 distinguishes between household members who are children, adults and the elderly. As we have seen above, a household member's age has implications for both their labor and health capacity. Children and the elderly are more likely to have higher illness burdens and are more likely to require additional caregiving efforts. These in turn are likely to lower a household's overall labor capacity, consequently reducing employment and ultimately household income and, indirectly, household wealth.

Households also may receive social support from extended family, friends, co-workers and affiliations such as faith-based and civil organizations. How social support benefits a household will depend on the social networks in which household members are embedded. For example, a household that has good friends and extended family members living nearby may rely on a grandparent to help with childcare, a sibling to provide an occasional short-term loan, a parent to help with a down payment on a new home, or neighbor to share the expenses of traveling to and from work.

Household wealth is often considered a kind of accumulated stock, whereas income is often considered a more transient flow. We can represent household wealth with a simple formula – household income minus household expenses plus household assets. As household wealth accumulates, it can be utilized to improve the household environment including more reliable transportation, better nutrition or higher quality housing.

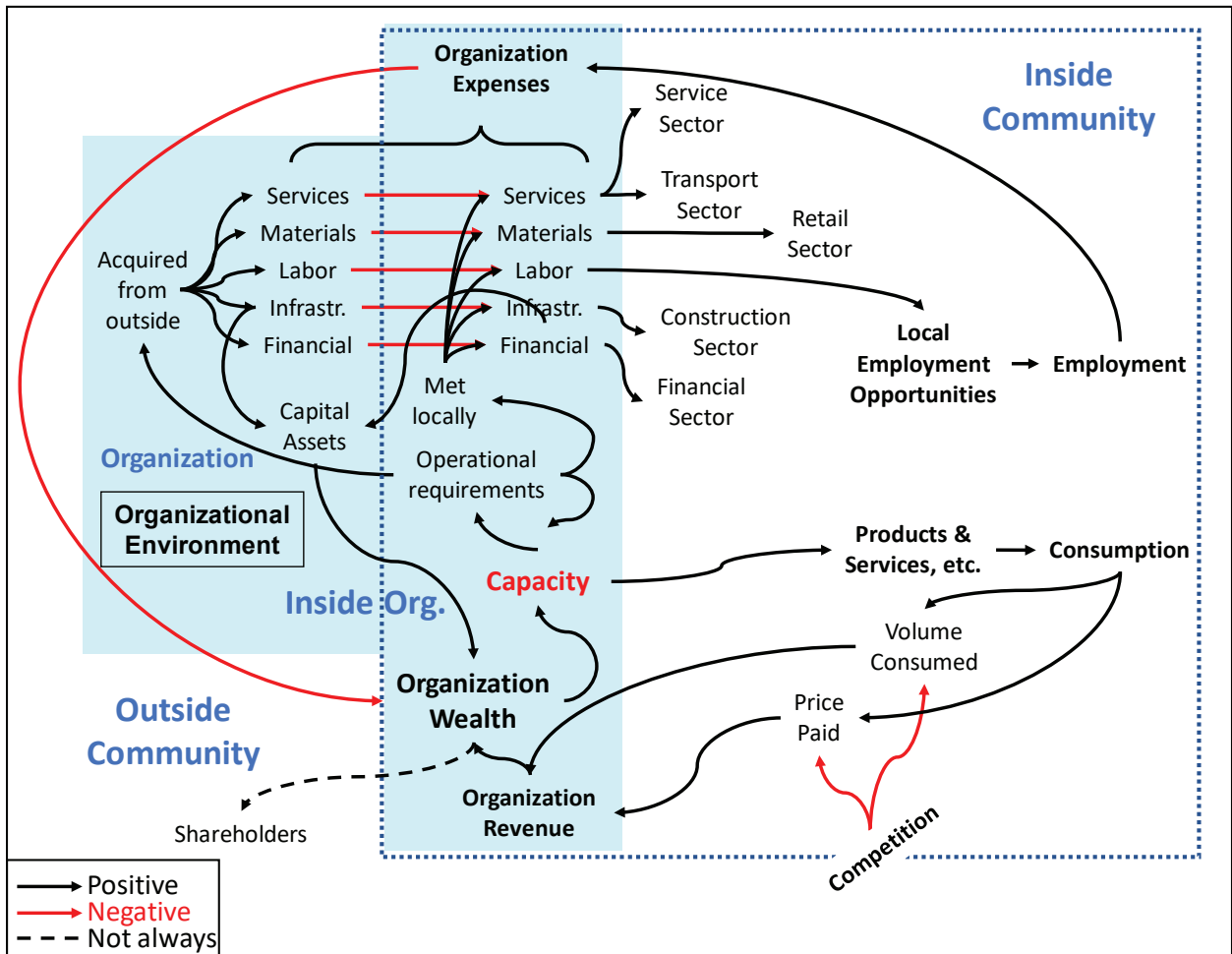
Each of these improvements to the household environment are also likely to lead to additional benefits. For example, improvements in transport can help stabilize a household member's employment situation, and better nutrition and quality housing are known to reduce illness burden related to obesity, diabetes and childhood asthma.

Key organizational dynamics

As we have noted above, all organizations have objectives and goals (see Figure 6). The range of organizational objectives and goals within a single community is usually quite broad and may include: manufacturing products, providing services, distributing and selling merchandise, offering social support and entertainment, or monitoring or governing others – to name a few. Though performing distinct functions, all organizations have a set of necessary components that affect an organization's *capacity* to meet its objectives and goals. Key components include labor (both intellectual and manual), as well as other operating requirements such as services, materials, infrastructure and access to finance. Organizations acquire these key components either locally or from outside the community. If they are acquired locally, they are likely to improve other community sectors such as retail, service, transport, construction and finance by generating demand for local goods and services. If the services are obtained from outside the community, they are less likely to directly improve the community's other sectors.

An organization's revenue comes from the consumption of products and services it generates and depends on the volume consumed and the price paid. Competition (from inside or outside the community) is likely to reduce either value or price and therefore reducing organizational revenue. Note that some of an organization's wealth can be moved outside a community if its wealth is distributed to non-local shareholders.

Figure 6. Basic organizational dynamics.



Legend: Blue arrows indicate positive relationships – as one increases the other increases. Red arrows indicate negative relationships – as one increases, the other decreases. Shaded areas indicate components inside of an organization, while white areas indicate components outside of an organization. Dotted line indicates the parts of the organization that are inside of the community.

Community dynamics

Just as households and organizations consist of complex interactions, communities consist of complex interactions among their local households and organizations. Below we examine some of the important interactions, including *organization-organization*, *household-household*, and *household-organization relationships*.

Key organization-organization relationships

Figure 7 shows some of the most important organization-organization linkages. It is important to note that organizational sectors play different roles. For example, growth in the sectors associated with manufacturing, agriculture, extraction (e.g., mining, forestry, fishing), and tourism are likely to produce growth in other sectors such as retail, services, finance,

that distribute resources such as water, power and communication; (c) mechanisms to maintain security such as the police and fire departments; (d) organizations to build labor capacity and help people recover or prevent illness like schools and hospitals; (e) and (e) the land and property on which the community is built. The infrastructural environment, however, is more than just the sum of its parts. Rather, it is the environment that makes it possible for businesses (and households) to function efficiently. Communities with good roads, fast internet, low crime and ample land make it easier for businesses to develop and expand; while communities with poor infrastructure make it more expensive for organizations to operate. One of the primary responsibilities of town managers are to oversee this environment through zoning, taxation and other regulatory mechanisms (more on this below).

The *business environment* emerges from the number and type of organizations in a community, as well as the interactions among them. The greater the diversity of organizations and the more they are interconnected the more robust the business environment. Organizations are connected both directly and indirectly. *Direct relationships* are those where two organizations exchange either goods or services with each other. For example, a manufacturing plant may rely on local organizations to provide cleaning, maintenance or transport services, or a restaurant may rely on food produced and sold locally as well as marketing services from an advertising agency. *Indirect relationships* are those where organizations are connected through the sharing of customers. For example, communities with bustling downtown centers or social gathering places (often around food, entertainment, festivals, etc.) are typically seen as beneficial to all the organizations involved. These environments tend to increase each business' interactions with customers. The importance of indirect organization-organization interdependence can also be seen when core businesses are weakened or close. Competition from outside of the community may force a single shop to close, thus decreasing the amount of customer traffic to other nearby businesses.

Communities that have vibrant and thriving infrastructural and business environments are likely to attract more organizations and more households thereby contributing to economic and population growth. Communities that have decaying and declining infrastructure and social environments are less likely to attract new business or households and are more likely to experience social and economic decline.

Key household-household relationships

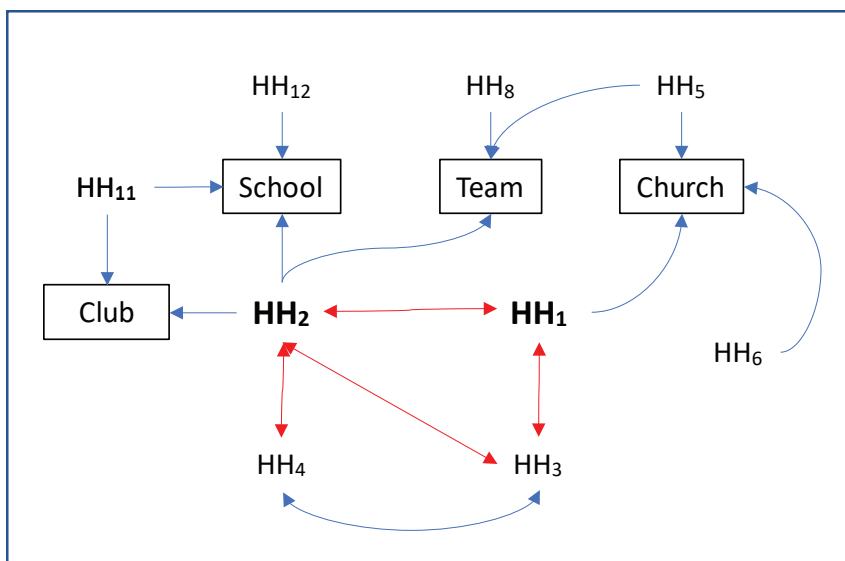
Like organizations, households also interact with each other directly and indirectly and form an emergent social environment. *Direct relationships* between two households arise when individuals from the different households form relationships with each other. These relationships can vary in strength, permanence and what is exchanged between them. Strong ties may include direct or extended kin or close friends – relationships that may last for years. Weak ties may include colleagues and acquaintances with whom there are more distal and less frequent relationships. Strong ties often provide the household with social and emotional as well as material support in terms of finances and labor. For example, extended family kin and close

friends may provide occasional childcare, transport or offer a household a loan when in need. Weak ties are more likely to provide indirect access to information and other resources.¹

Indirect relationships between two households arise when individuals from the different households are affiliated with a shared organization or other individual. Households may be indirectly linked because some of their members attend the same church, are members of the same club or are involved with the same civic organization. In indirect relationships, household members need not know each other well or in fact at all. What is important in these relationships is the shared affiliation. Households are linked together by being parents of children in the same school, attendees of the same church, synagogue or mosque, members of the same club, sorority or fraternity, or fans of the same team. Such affiliations are critical for binding a community together as they often cut across class, race, ethnicity and political segmentation that may limit opportunities for community residents. Such affiliations often open doors and allow for the mobilization of resources in times of need.

Household-household relationships are an amalgamation of the direct (including strong and weak ties) and indirect relationships of their members. Given the number of members in a household and their multiple relationships, the network of any given household can be quite large and diverse. In Figure 8 for example, *Household 1* (HH₁), has direct relationships with two other households (HH₂ and HH₃) and three indirect relationships (HH₄, HH₅ and HH₆). In contrast, *Household 2* (HH₂) has three direct relationships (HH₁, HH₃, HH₄) and four indirect relationships (HH₅, HH₈, HH₁₁, HH₁₂).

Figure 8. Examples of direct and indirect household-household relationships.

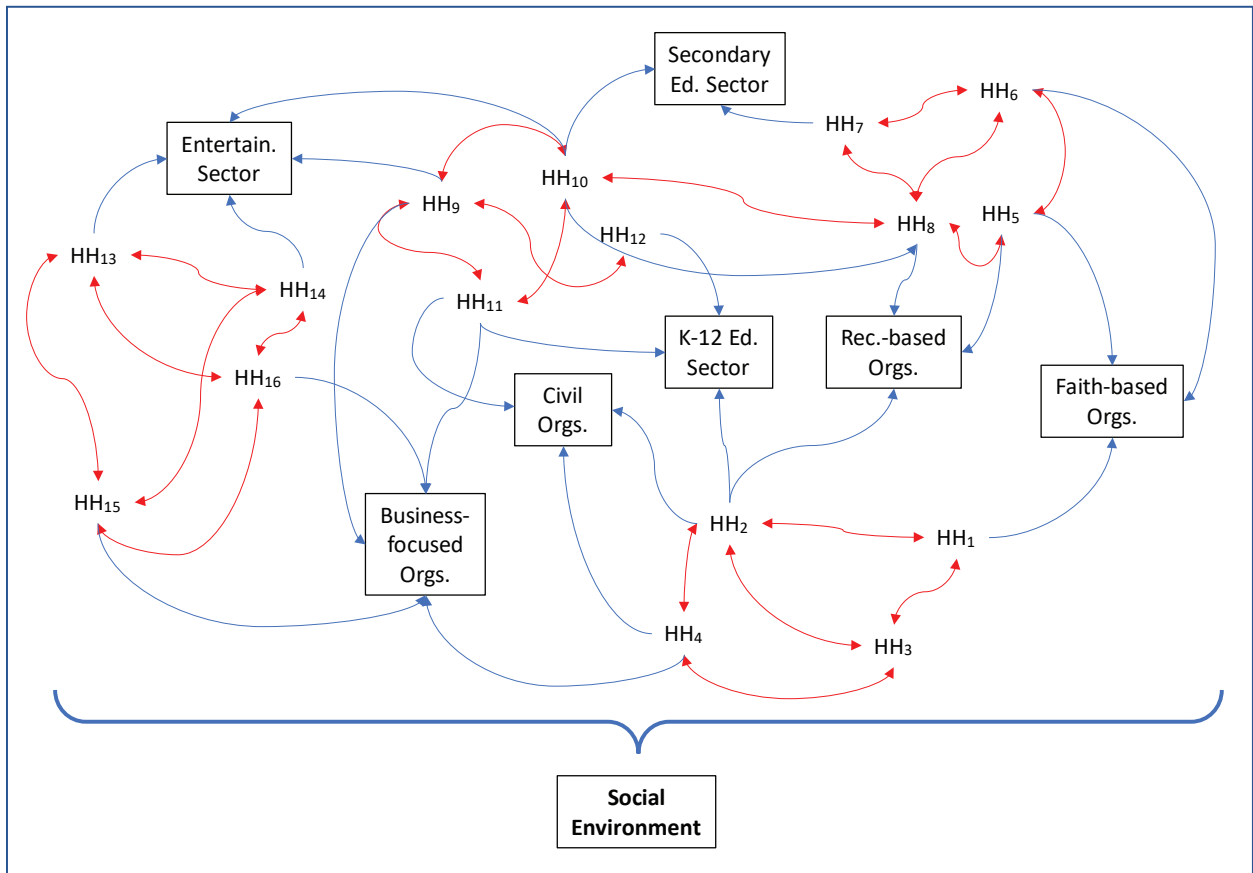


Legend: Blue arrows indicate positive relationships – as one increases the other increases. Red arrows indicate negative relationships – as one increases, the other decreases.

¹ Granovetter, 1977.

The overall social environment that emerges from household-household and household-organizations interactions is distinct but related to the business and infrastructure environment describe previously. Figure 9 shows the relationships among twelve households and five types of social sectors and the dynamic social environment that it produces. The more opportunities that household members have to interact into each other through their affiliation with civic, faith-based, education, entertainment, and business-oriented organizations, the more chances there are to foster diverse household-household relationships. The more interactions among households (directly or indirectly), the greater the chance that households may provide support for each other. The more diverse and interconnected a community is across businesses and households, the more it is likely to innovate and adapt to a changing world and the more likely it is to be resilient to sudden shocks and disasters.

Figure 9. Key household-household dynamics in a community.



Legend: Red arrows indicate directly relationships among households. Blue arrows indicate indirect relationships between households through their relationship with shared organizations.

Community in context

All communities *interact* with a larger geographic and socio-economic context. By interact, we mean that the influence flows in both directions – inward and outward. Businesses and households in a community are directly affected by the availability of resources located outside their borders, and in turn, businesses and households affect the communities by which they are surrounded. Below, we describe some of the fundamentals of such interactions.

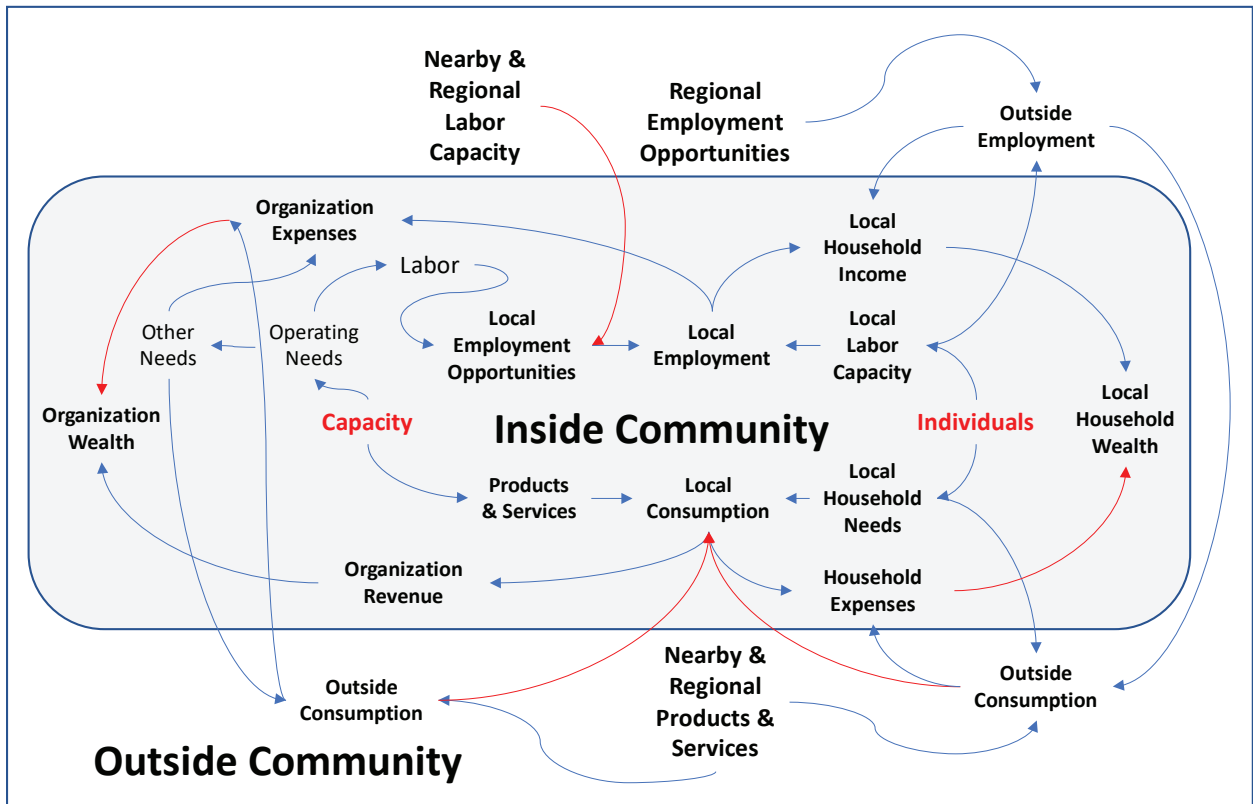
Outside influences

When considering how outside factors influence a community and its members, it helps to distinguish between regional and more distal contexts. Regional context includes the immediate geography surrounding a community and includes all the territory occupied by adjacent communities. How far the region extends depends in part on how far household members typically travel to either find employment or shop to meet household needs. Regions are typically defined by a central economic hub and the communities that surround it. Distal contexts are those that extend beyond the region and may include: other regions, the state,

clusters of states that share similar geological conditions (e.g., the south, northeast, etc.), the country or the rest of the world. We explore both below.

Figure 10 shows the primary mechanisms through which communities are affected by nearby and regional labor supply, job opportunities and the availability of products and services. Some organizations, for example, may draw from nearby and regional labor pools (as well as global labor pools if the tasks can be done remotely). Although this may benefit some community organizations in meeting their labor needs, it has a negative impact on the availability of local employment opportunities for community residents. The opposite may also occur with nearby and regional communities offering employment opportunities that community members travel to fill. Although these jobs are found outside the community boundaries, they contribute to the community's overall household income. In addition to offering employment opportunities, nearby and regional communities also may compete with local businesses. The more local households fulfill their needs outside the community, the less they are likely to consume from businesses inside their community. Note that as outside employment increases, typically outside consumption increases as well due to convenience of shopping near places of employment. Like households, community businesses also may meet their internal needs by acquiring inputs from nearby and regional providers, thus reducing what they consume from within their community. Such reductions in local consumption are likely to have an impact on a community's retail and service sector.

Figure 10. Examples of how nearby and regional forces can affect communities.



Legend: Blue arrows indicate positive relationships – as one increases the other increases. Red arrows indicate negative relationships – as one increases, the other decreases. Shaded gray area indicates the activities and conditions that occur inside of a community. White area indicates the activities and conditions that occur outside of the community.

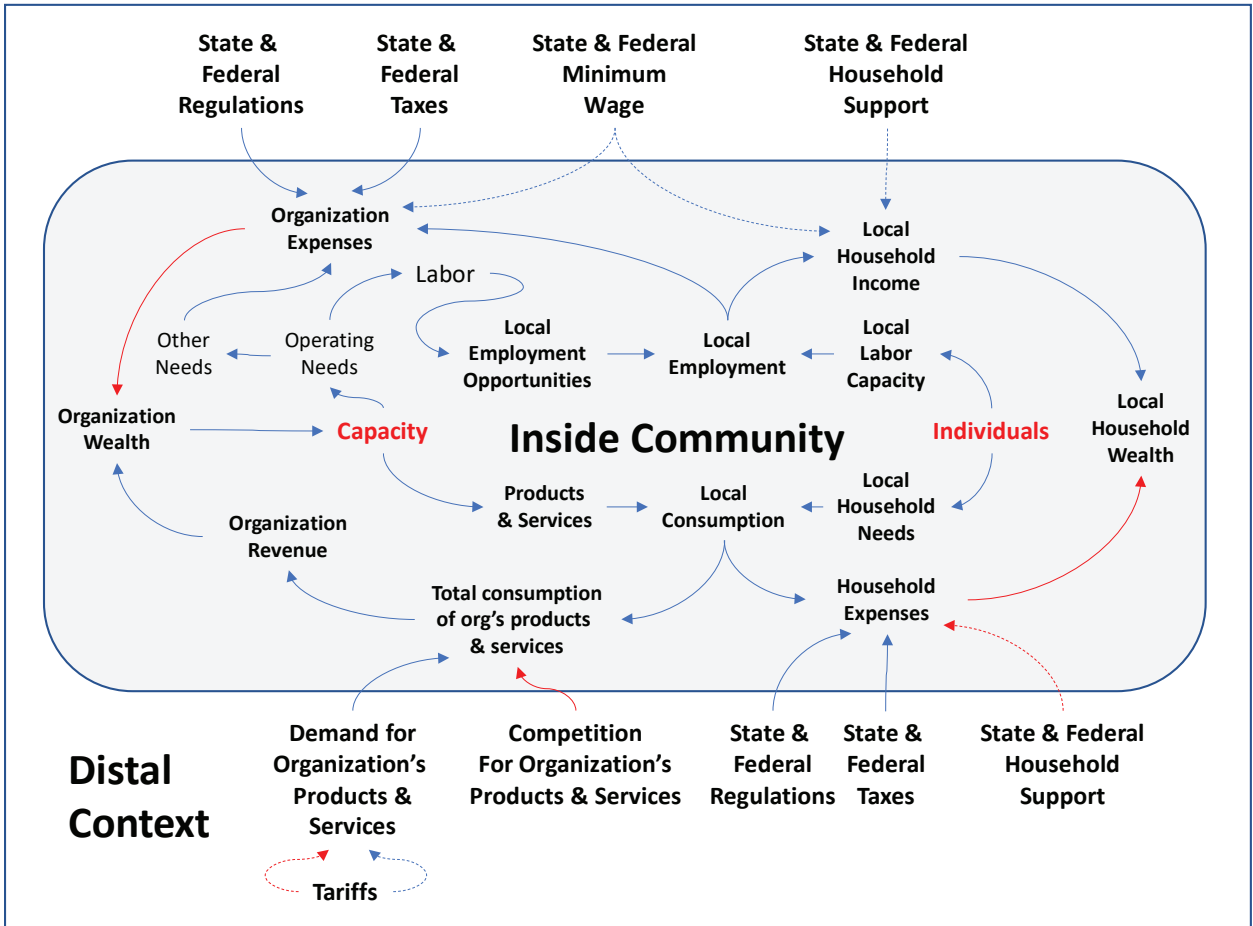
In addition to being affected by its neighbors, a community is also impacted by more distal actors. Figure 11 shows some of the primary mechanisms through which this occurs. State and federal taxes, for example, may increase the expenses of either organizations or households (depending on the tax). The same holds for state and federal regulations such as labor and building codes. Changes in minimum wage, for instance, may have a different kind of multi-pronged effect. Raising the minimum wage may increase expenses for some organizations that employ low-wage labor which may encourage them to move production elsewhere or invest in more automation. At the individual and household levels, increasing the minimum wage may entice some people to enter the labor market and increase their households' overall income or it may result in some people losing their jobs and may decrease their household's overall income. How this plays out in any given community will depend on the mix of labor used in a community's organizations and how individual organizations respond and the mix of income on which a community's households depend. State and federal household support mechanisms are also delivered through different pathways. For instance, some federal programs like Social Security and state programs like Medicaid provide income support to some households while

other programs provide free or subsidized goods and services that help reduce other households' expenses.

Changes in global supply and demand also may affect a community's organizations differently. An increase in demand for an organization's goods or services is likely to increase the total consumption of the organization's goods or services, thus increasing an organization's revenue stream. In contrast, an increase in competition may lead to reductions in the total consumption of an organization's goods and services, thus reducing an organization's revenue stream. National tariffs can further influence the supply and demand of specific goods and services. For some community organizations, tariffs reduce demand by increasing the costs of production; while in other cases, tariffs increase demand by making competitors' products and services more expensive.

Figure 11 highlights two important implications regarding the effect of outside forces on communities. First, communities often have little to no control over the most distal factors in their environment. Decisions by others – often thousands of miles away – can have differing impacts on specific households or organizations inside of a community. Second, the net effect of any specific change on the community is extremely complex. All outside influences are first mediated through individual households and organizations. How the households and organizations respond will then affect other organizations and households both inside and outside the community.

Figure 11. Examples of how state and federal-level forces can affect communities.



Legend: Blue arrows indicate positive relationships – as one increases the other increases. Red arrows indicate negative relationships – as one increases, the other decreases. Shaded gray area indicates the activities and conditions that occur inside of a community. White area indicates the activities and conditions that occur outside of the community.

Community growth and decay

Community growth is typically measured relative to the size of its population. The total population of a community depends on the rates that children are born and the rates at which people die (natural population growth) as well as the rates at which people (or households) arrive or leave the community (net migration). The rates of emigration and immigration often are influenced by job quantity changes in the community's economy (Brown, 2014) and proximity to metropolitan and micropolitan regions (McLaughlin and Shoff, 2014).

Figure 12. Mechanisms through which communities attract more households and organizations.

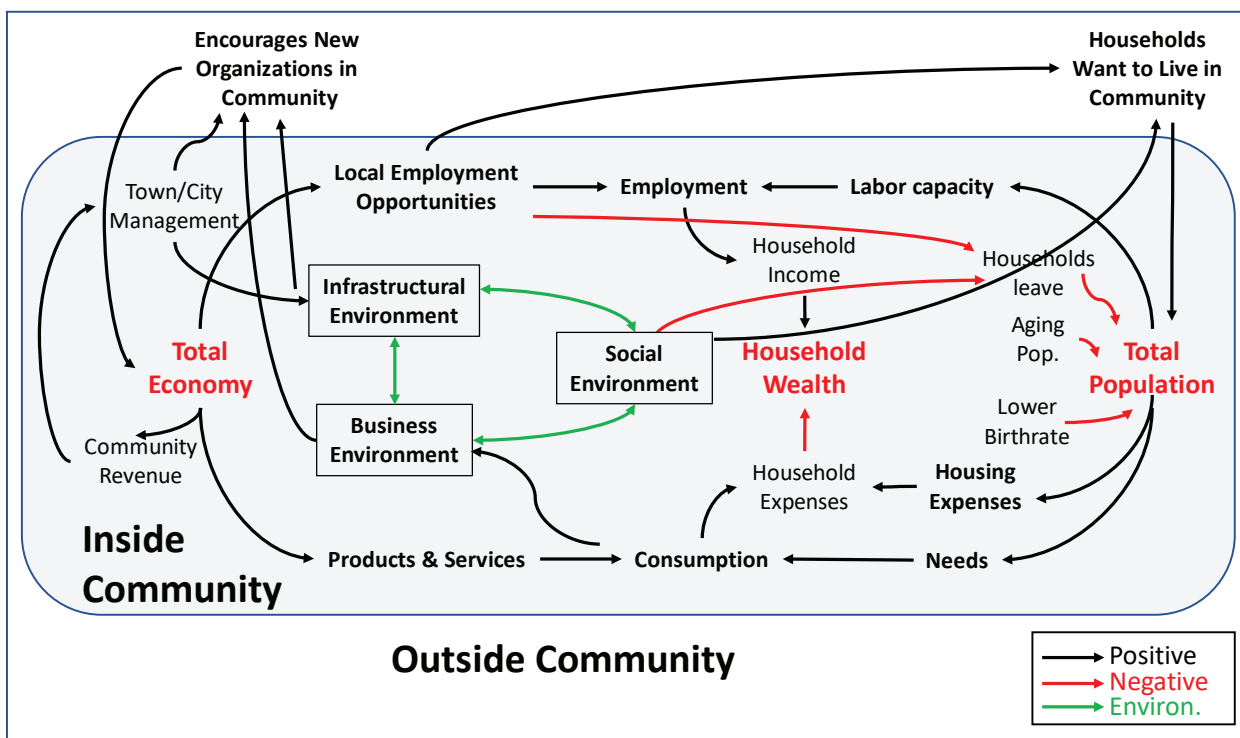


Figure 12 shows some of the primary mechanisms through which communities attract more households and more organizations. To offset lower birthrates and aging populations, communities often need to attract new households (and individuals) to maintain or grow their populations. Two of the primary mechanisms that draw new households to communities are increases in job opportunities and supportive and vibrant social environments. These also are the same mechanisms that often keep households from leaving a community. Communities tend to decline in size as job opportunities dwindle and the social environment deteriorates, and households (and individuals) move away.

What attracts new businesses to the community (or facilitates their inception and growth) is somewhat different from what attracts households and individuals. Organizations are more likely to settle in places with up-to-date and efficient infrastructure, a supportive business environment and a labor pool that meets their needs. Although town or city management can make organizations aware of local opportunities and can offer additional incentives (such as lower taxes, favorable zoning, etc.), they are unlikely to overcome an inadequate infrastructure, a weak business environment or lack of required labor. When the local business infrastructural environment either begins to decay (or fails to keep up with advances in other communities), organizations find it more expensive to operate or are unable to meet their needs and decide to either move or close. This in turn has negative effects on community households and the overall social environment in which they are embedded.

Quality of life in changing communities

Figure 12 also shows why a community's overall household wealth is difficult to manipulate. The right side of the figure shows that as population increases, so too does the community's overall labor capacity. Population increases also increase a community's overall household needs, which in turn increases total community consumption. Increase in population, however, also tends to increase housing expenses, particularly if housing stock fails to keep pace with an increase in residents. Unless household incomes increase to offset increased living expenses, total household wealth can, in some cases, be reduced.

The dynamics of what happens to household wealth within a community are complex and will depend on the kinds of labor capacity needed by growing organizations and how this labor capacity is distributed among households. For example, imagine a community whose economy is growing due to an increase in businesses that utilize a high proportion of high-skilled labor. As more households with high-skilled labor capacity enter the community, housing costs (and other expenses) are likely to increase. For households with incomes that do not increase proportionally, this means that their housing expenses are likely to rise and their overall wealth will decline. Some households will find ways to adapt by trying to increase their household income via additional employment (think gig-economy), by lowering their housing costs (e.g., finding cheaper and often less-desirable accommodations) or by drawing from what wealth they have already accumulated. Others will simply decide to move out of the community. This is the pattern often found in what is termed *gentrification*.

The role of labor-saving technology

In small and large communities alike, technology is a two-edged sword. On the household side of a community, technology is often used to reduce the labor of household members (e.g., washing machines and dishwashers, etc.) and to increase the quality of their lives (e.g., telephones, internet, electronics, etc.). Households acquire new technology at different rates. Early adopters tend to acquire them more as luxury goods and see them as part of their discretionary income. Over time, many types of technology become ubiquitous in a community (think cell phones, computers and internet access, etc.) and late adopters often don't have a lot of discretionary income and tend to acquire them to as part of their basic household expenses.

On the organizational side of the community, technology tends to increase productivity in all kinds of organizations including manufacturing, finance, construction, retail, and service providers. At some point, however, technology begins to replace the labor provided by individuals in the community. Some of the local labor capacity freed up by technology may be absorbed by other existing organizations in the community or may lead to the emergence of new employment opportunities. Labor that is not absorbed, however, will have direct effects on the employment and income generation of households, which in turn affect what they can purchase and therefore indirectly affects local businesses.

Making Conceptual Frameworks Useful

We find conceptual frameworks to be powerful tools for thinking about, preparing for and responding to change. Since conceptual frameworks capture the logical structures of a phenomenon, they can be applied to specific cases, as well as to the phenomenon in general. Thus, we can apply the conceptual framework described above to a single rural community in rural Vermont, as well as to all rural communities in the Northeast.

Conceptual frameworks also can be used to trace the direct and indirect effects of stressors (think mechanization of agriculture or slow decline of population) or significant events (think closing of a major manufacturer or failure of a small local college) event in a complex system. We also can use them to anticipate the effects that different interventions (think business development or infrastructure investment) might have in improving specific outcomes (think employment, population growth or quality of life) in a system. Finally, conceptual frameworks keep us focused on the big picture and prevent us from becoming overly myopic in our focus. We expand on each of these uses below.

Using the conceptual framework to anticipate effects of change

We find them most helpful for addressing early, hypothetical questions about a general phenomenon or a specific situation. We can start at any point in the figures above and begin to ask questions. For example: How might a community be affected if its largest employer closes? Who in the business community will be most affected by such a closure? Which households are likely to leave the community?

Applying the conceptual framework to a single rural community

Let's look at an example. Take the case of a major manufacturing plant closing in a community of roughly 25,000 residents living in about 6,000 households. [Note: This case is loosely based on the closing of two coal-fired power plants in Adams County, Ohio (MacGillis 2018) Of these households, approximately 1,000 are composed of seniors who are no longer working, 2,000 are composed of working adults (single or couples) without children or adult dependents, and the remaining 3,000 have at least one working-age adult and some number of dependents. Over an 18-month period, a total of 600 employees lost their employment. Of these, 100 held management positions, 400 were local union employees who worked in one of the two plants and 100 were contractors who came from outside the community. So how might a community be affected?

The framework tells us where to begin to look. We know from Figure 1, that the closure will have an immediate affect employment of 500 community residents and this will in turn affect income of the households in which they live (more of this in a moment). We also know from Figure 6 and 7, that the closure will likely affect other organizations within the community that might supply services (such as transportation, catering, marketing, legal), materials (such as suppliers and retail), infrastructural development (such as construction and building trades) and financial (such as banks and local lending institutions). Some of these effected businesses may

fail because of lost revenue, others may scale back their operations, including scaling back the number of employees or employee work hours or benefits.

In addition, the closure is likely to impact the tax revenue that the community generates. Figure 7 shows how this may in turn influence the amount of public resources that can be used to finance public works (such as roads, police, fire and recreation) and education (such as school maintenance, supplies, teacher salaries).

On the household side of the community, the closure will directly affect all the households where a household member lost his or her job. Figure 5 shows how this might play out at the household level. The effect on individual households will depend on the household's total labor capacity, its current caregiving requirements, its total health capacity and illness burden, as well as its household needs accumulated wealth.

Which households find new employment inside or outside the community and which decide to stay or leave will in part depend on the type of employment they lost when the plant closed as well as the strength of their social support systems. The roughly 100 households that lost management jobs are more likely to seek and find new employment outside the community, primarily because there are fewer open management jobs within the community. The likelihood is that a substantial portion of these households will either leave entirely or commute to work outside the community. Figures 10 and 12 show that the plant closures are likely to: (a) reduce the community's overall population and (b) increase the number of people who are working outside the community. The figures also suggest that there will be secondary effects on local businesses. Households that have less income are likely to reduce their household consumption which in turn affect the businesses that previously had supplied them with goods and services.

The roughly 400 households that lost union positions face similar issues as their white-collar colleagues – they must: (a) find new employment to return the household income to previous levels; (b) reduce their household expenses; (c) use wealth they have already stored (such as dipping into savings and liquidating other assets); or (d) some combination. Some will find equivalent employment locally, but a community of this size is unlikely to absorb all of those who have lost their jobs. Others will find equivalent jobs outside the community. Some will rely on other household members to increase the amount they work. Although most households will take advantage of unemployment insurance (at least for a while), unemployment insurance rarely compensates fully for the total income lost. As a result, many households will simply have to live with lower household incomes.

As Figure 5 show, lower income impacts all household members. Unless household expenses are reduced to offset the loss of income, household wealth is lowered. In a crude sense, wealth acts like fat in the body, a kind of energy reserve for more difficult times. When wealth is reduced, it can result in less reliable transport, poorer quality housing, reduced use of healthcare and even poorer nutrition. These effects in turn may lead to an increased household illness burden and/or risks to stable employment.

Reductions in a household income are rarely ever confined to just the household itself and are likely to have multiple effects at the community level as well. As Figures 2 and 6 show, households with less income are likely to reduce expenses lowering their consumptions which in turn impacts the local retail, service and entertainment sectors. Furthermore, the more a

household draws on resources from their social network (Figure 9), the more these other households' resources are also stretched. Although social support is often seen as a positive force that acts as a safety net, we often forget that social networks are also mechanisms for indirectly spreading the negative effects of events like plant closures to a larger number of households.

Even if households manage to find work outside of the community, the outside employment may still have a negative impact on the community. As shown in Figure 12, the more residents work outside their community, the more likely that they are to purchase goods and services from outside retailers and vendors. This further reduces local consumption which impacts the revenue generated by local business organizations.

Figure 12 also shows the impact of reductions in a community's total population. If more households move away, this affects not only the amount that is consumed locally, but also has significant impacts for education and health providers. Reductions in the number of school age children can have a significant impact on the size of the local school system. Since most states allocate K-12 education funding to local school districts on a per-pupil basis, a reduction of even a small number of students can mean a significant reduction of funds that flow into a community. This in turn can result in the reduction of local teachers and school administrators. A similar effect is found for healthcare providers. As communities shrink in size, it becomes more difficult for communities to support local physicians and dentists as well as clinics and hospitals.

Applying the conceptual framework to rural communities in general

In addition to acting as a tool to help “diagnose” and potentially “treat” problems struggling communities face, the conceptual framework also suggests a few key takeaways regarding how communities respond to slow and rapid changes that occur inside and outside their boundaries.

First, the figures above show how changes reverberate throughout a community via multiple pathways, namely via: organization-organization, organization-household, and household-household feedback loops. The example of the closed power plants illustrates all three. The closing of a medium to large manufacturing plant not only directly affects other local businesses and a set of community households which can indirectly affect other households in their support networks. These reverberations continue like waves in a bathtub, moving back and forth, weakening households and community organizations a little more each time.

Second, these reverberations have the strongest effects on actors when: (a) there is a direct link with the change mechanism (in this case the plant closure); and (b) when the actors are already weakened and vulnerable. For example, we expect businesses with strongest ties to the plant and those who were already struggling to be more likely to fail than more distal organizations or those that have more vibrant business with a larger, more diverse clientele or accumulated capital. Likewise, in households where members have lost their jobs, the impact will be direct and strong, particularly for the households where most of the income is generated from the plant or households that have the least amount of accumulated household wealth.

Third, like sound waves, reverberations of change are tempered by diversity and padding. Communities that have a diverse array of businesses that interact with each other in beneficial ways are more likely to survive internal shocks like the closing of a plant. Likewise, communities

that have a diverse set of “healthy” households – ones that have accumulated some amount of stored wealth – can weather economic storms better than those that have declined over time. Strong social safety nets, whether provided by the government, not-for-profit organizations, or social networks can play a major role in helping communities move through economic downturns and turmoil.

Fourth, a community’s viability (or resilience as described above) depends on its ability to continuously maintain and improve (when possible) the labor and health capacity of its residents. Communities are more likely to struggle when the most educated and capable youth and adults leave and are not somehow replaced. They also are likely to struggle when residents are unable to recover quickly from acute illnesses or when households are strapped with additional caregiving requirements when its members suffer from more chronic debilitating conditions. This seems particularly true of communities that are aging. Schools (both K-12 and secondary institutions) and health facilities are critical for maintaining a community’s potential. When they are diminished or move further away, the whole community is impacted.

Finally, the conceptual framework suggests that a community’s overall viability can be measured in crude terms by general characteristics like a community’s infrastructural, business or social environments. The *community capitals framework* and the *Comprehensive Rural Wealth Framework* (Rural Policy Research Institute 2018), are good examples of this kind of measurement. But like fever, blood pressure and body-mass index in the human body, these are only signs and symptoms of a healthy organism. To maintain or return a community to a robust health status, interventions need to be targeted at the underlying mechanisms that generate aggregate organization or household wealth.

Using the conceptual framework to anticipate the effects of interventions

How might the community prepare for closures they see coming? Where should the community invest limited public resources? What might happen if a community invests in one intervention compared to another? Of course, the conceptual framework doesn’t answer these questions directly, but it helps us structure what actors, mechanisms or contexts we might want to consider. It also helps us anticipate possible primary and secondary effects of potential interventions. For example, what might happen if a community was to invest in revitalizing its downtown (like Burlington, Vermont and Greenville, South Carolina did some 20 years ago) or public-private invest in its economy or culture and arts (like Eastport, Maine){Fallows, 2018 #283}?

We should note both the community resilience and community wealth frameworks have tried to translate their approaches into concrete steps for improving the health and wellbeing of communities and both have begun to explore how these interventions might be evaluated (Pender et al., 2012). Not surprisingly, both frameworks emphasize intervening on a variety of actors inside of the community.

For example, 100ResilientCities suggests community reliance can be improved by: (1) promoting effective leadership, (2) empowering a broad range of stakeholders, (3) fostering long-term and integrated planning, (4) meeting basic needs, (5) supporting livelihoods and employment, (6) ensuring public health services, (7) promoting cohesive and engaged

communities, (8) ensuring social stability, security, and justice, (9) fostering economic prosperity, (10) providing and enhance protective natural and man-made assets, (11) ensuring continuity of critical services, and (12) providing reliable communication and mobility (<http://100resilientcities.org/resources/>).

The first three recommendations focus how a community is managed and led. The community's or city's official management apparatus is captured in the bottom, left corner of Figure 7, but as 100ResilientCities suggests, to be effective leaders need to involve stakeholders from throughout the community. These include those stakeholders that represent the diverse organizations in the community as well as the stakeholders that represent the diverse set of households in the community (i.e., the left and right sides Figure 3 above). Recommendations 4, 5 and 6 stress the importance of paying attention to the basic needs and livelihood of households (the right side of Figure 3). The remaining recommendations focus those aspects of a community that bind it together as an adaptive system – one that promotes fair, stable and secure interactions among all its organizational and household members.

The community wealth framework has also been applied in various settings (Flora et al., 2007; Pender et al., 2012). For instance, Flora, Emery et al. (2004), suggest that communities consider investing in seven types of community capital, including natural, cultural, human, social, political, financial and built. For each type of capital, they offer examples of potential actions and interventions communities could implement. We summarize some of these examples in Table 2.

Table 2. Types of Capital

Type of Capital	Example actions, interventions and investments
Natural	Preserve, restore, enhance or conserve the local ecosystem to improve landscapes, scenery, outdoor recreation opportunities, soils, air quality, water quality, wildlife, vegetation, often via changes in land development policies.
Cultural	Share and promote cultural identities such as residents’ heritage, history or ethnicity, often via new community festivals and cultural events.
Human	Enhance the use and skills sets of residents via increased training programs and improvements in healthcare, childcare and youth and adult education.
Social	Increased engagement of diverse stakeholders in community development efforts to increase community cooperation and improve local strategic planning and leadership.
Political	Improve cooperative relationships between community development board and local, county, state, federal, tribal, regional governments via increased community and government connections at various levels.
Financial	Increase availability of local and external financial support via such mechanisms as issuing community bonds, obtaining outside funding to improve infrastructure and business development and other poverty reduction measures.
Built	Invest in improved infrastructure including telecommunications, education facilities; government buildings; community buildings; transportation; business district; health care facilities; industrial park; indoor recreation facilities; cultural facilities; housing; churches; city services; energy services, etc.

The U.S. Department of Agriculture also has indicated how the *community capitals* framework might be used to generate wealth through policy changes and decisions of local actors. For a more complete description of how the community capital framework has been applied and its implications for wealth generation, see Pender et al. (2012).

Using the conceptual framework to understand success

Finally, the conceptual framework also provides insights into why some small rural communities have managed to thrive in a rapidly changing world. Consider the examples presented in James and Deborah Fallow’s book, *Our Towns* (Fallow and Fallow, 2018). Between 2013 and 2017, the couple spent time visiting dozens of small cities and town across America often visiting multiple times. Over their travels, they “developed an informal checklist of the traits that distinguished a place where things seemed to work.”

Four items on the Fallows’ list are related to the importance of leadership and community involvement and include the Fallows observations that: (a) people work together despite national politics; (b) you can identify the local leaders; (c) people know their towns revitalization

story; and (d) they have big plans. In our framework, these characteristics are those represented in part by the emergent properties of business environment (Figure 8) and the social environment (Figure 9). These are the catalysts that lead to change.

Three items focus on the importance of education and training opportunities and include: (a) they are near a research university; (b) they have, and care about, a community college, and they have distinctive, innovative schools. In our framework, education (and healthcare too) are centrally located in the figures. They are the components that appear on both the organizational and the household sides of a community (e.g., Figures 5, 7, 8 and 9). Education (and health) are the mechanisms that improve the human capital of a community. They are vital if a community is to adapt to change, and they act as magnets for attracting new households and residents to the community.

Two items focus specifically on the importance of organizational integration and include: (a) having a thriving downtown; and (b) real examples of public-private partnerships. These correspond to the emergent infrastructural and business environments shown in Figure 7. As we noted above, the more interconnected a community is, the more it is likely to weather change and thrive.

The last item in the Fallows' list focuses on a community's ability to remain open to outsiders. Many rural communities are faced with falling birth rates and aging populations. If they want to retain their populations and offset the loss of their younger populations, they need to attract outsiders (Figure 12). Often these outsiders come as immigrants, with different languages and practices.

For, the Fallows, however, "most reliable gauge" that a city is working and on its way back, is that it "will have at least one craft brewery, maybe more, and probably small distilleries too (Fallows and Fallows, 2018:407." We think the Fallows are indeed on to something. It is clear from our framework that craft breweries are an integrating industry. Craft breweries are often started by young entrepreneurs who have graduated from local education institutions and rely on the demand from a population of young adults. Craft breweries are a manufacturer that employs a range of skilled and unskilled workers. The product is always sold locally (and often outside the community). The product is also incorporated into the local entertainment businesses such as bars and restaurants and is often associated with local fairs and festivals. Combined, these enhance both the local business environment (Figure 7) and the community's social environment (Figure 9) by drawing residents (and outsiders) together. We couldn't agree with the Fallows' final comment about craft breweries being a good indicator of a thriving small city or town, "It sounds like a joke, but it explains a lot."

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Appendix: How Do We Build Conceptual Frameworks?

The following methodological description is based on our previous experiences building conceptual frameworks.

To begin, it is important to remember that the development of conceptual frameworks is an exploratory technique. This means we are trying to move from understanding something a little to understanding it a lot better and more systematically. We are clearly not testing hypotheses nor are we estimating population parameters. But we are also not trying to generate hypotheses or hunches either. We are trying to outline a phenomena's structure and how its component parts interact with each other as a system.

Below, we describe some of the steps that we find helpful for guiding novices through the process.

Getting started

To start, we recommend unpacking a phenomenon by simply asking, "What is X? For example, what is a community? We might answer the question by looking up the definition in the dictionary: "A unified body of individuals such as the people with common interests living in a particular area (Merriam-Webster, 2019)." Or we could compose our own definition: "A group of people, households and organizations, interacting with each other in a bounded, geographical area, that is embedded within a larger society." The beauty of a definition is that it is made of logically necessary parts. For example, we know from our own definition that any conceptual framework of community will need to include: (a) people; (b) households; (c) organizations; (d) interactions among these actors; (e) community boundaries; (f) geography, and (g) the larger social context.

Alternatively, you can start by asking yourself some of the following questions:

- What are the key components?
- Who are the key actors?
- How are the key components linked together?
- What is necessary for the system to function?
- What is true of all examples of this phenomena?
- What things are exchanged?
- How do things flow through the system?
- What role or roles do key components play?
- Where do we expect to see variance?
- What are the rules that govern interactions?
- When can the rules be broken?
- Why does the system work the way it does?
- What examples don't fit?

The answers to these questions become the starting points for your initial thinking about how all the parts work together as a *coherent system*.

Data

Unlike many exploratory approaches (e.g., grounded theory, ethnography, case studies, ethnographic decision modeling, etc.), the development of conceptual frameworks does not require the collection of empirical data in the form of observations, elicitations or acquisition of secondary materials. Since the objective is to create a high-level framework based on logic, a thorough thought experiment is enough. We recommend saving the data collection techniques for understanding details and variation after completing the conceptual framework.

Those unfamiliar with the process, often ask, “But how can I build a framework if I don’t know anything about the phenomena?” But that isn’t true. Most adults know the basics of how many phenomena work. Take homelessness. Few people would consider themselves expert in the topic. But the basics are not that difficult to grasp. Homelessness is a state in which people find themselves; one that is defined by a lack of shelter. We know that people are not often born homeless, so it is a state they fall into somehow. It is also a state from which they can exit, and in fact, there are many people and organizations dedicated to helping the homeless do just that.

One easy way to start is to develop a conceptual model about homeless is to treat it as a process. Any process can be broken into multiple stages, such as: not being homeless, falling into homelessness, homelessness, getting out of homelessness and not being homeless again. Let’s look at some of these stages in more detail.

Of course, there are many different pathways to getting to the homeless stage, but at its core pathways to homelessness starts with a breakdown in the relationship a person has with a household. In one case, the housing disappears (e.g., people who are homeless after natural disasters); in the other case, the housing remains, but an individual loses access to it either by force (e.g., people being evicted from their apartments) or choice (e.g., adolescents running away from an abusive home).

Once a person reaches the stage of being homeless, they still must eat, sleep and take care of their other basic needs. Unless they can meet these needs in one place (which is unlikely), they will have to move throughout the day to either fulfill these needs directly (e.g., going to a soup kitchen to eat) or indirectly through other activities (e.g., panhandling to buy food). We also know that homeless people are meeting most of their basic needs in public spaces – spaces that were designed to be used temporarily by those who had housing. As these individuals move through these public spaces in search of food, shelter, security, etc., we should not be surprised that they run into conflicts with others who normally use these spaces.

Note that up to this point, we have just concentrated on the individuals experiencing homelessness. Yet there are many kinds of actors who interact with those who are homeless. For example, many public and nongovernmental agencies and organizations are dedicated to helping people avoid falling into homelessness and helping them get them out. The homeless also interact with other actors such as business owners, private citizens and law enforcement who may engage with them in positive or negative ways. Our point here, is that it doesn’t take a lot of knowledge to start to develop a conceptual framework.

Bounding

In the social world, all phenomena must be bounded in some way, otherwise, you find that everything is related to everything else. Think of bounding a conceptual framework as deciding where to stop intellectually. Although we mention it first, the boundaries of a conceptual framework are never completely set until the end of the project. It helps, however, to consider what should be included and what should be excluded from the conceptual framework at the start.

For example, in the homelessness case above, we bounded the phenomenon along two core dimensions. First, we included the entire process from a before people fell into homeless to after they exited from it. Second, we included not only the people experiencing homelessness, but all the actors who had direct contact with them. Note that we were still somewhat unclear as to how far before or after homelessness we wanted to go, and we did not include any secondary actors such as the funders of agencies and organizations trying to address the problem.

Drawing

A few suggestions and cautions about drawing when developing conceptual frameworks. First, we use drawing in two ways – drawing-to-think and drawing-to-communicate. In the early stages of the process, you are using drawing to think about how the phenomenon works. Here prettiness doesn't count, just like spelling doesn't count in first written drafts. It is best to think slow and draw fast – scribble if necessary. Then step back and ask yourself: What is missing and what doesn't seem right?

Second, you must start somewhere. We recommend using a large piece of paper or a big white board and starting by drawing the key components (e.g., actors, objects, etc.) as words, images or just plain stick-figures. If the phenomenon is organized around distinct stages (like the homeless example above), then you might want to organize the components along this dimension. Next ask yourself if there is anything that flows or is exchanged between the components and how the components are related to each other. We find it helpful to use labeled lines to represent these connections. Don't be shy about using analogies, similes and metaphors to describe how something works. These linguistic tools can often help you see your phenomenon in a different light.

Third, avoid thinking in factors and variables. Researchers have often been indoctrinated into believing that research is about testing hypotheses or models. They want to turn the word into abstract constructs that they can measure precisely and then can feed into their fancy analytical methods to generate empirical results. In some ways, you are trying to do just the opposite. You are trying to identify a phenomena's obvious components and assess the real-world mechanism through which they interact to ultimately generate a logical map.

Fourth, do not worry about making your drawings pretty until you are at the end of the process. If you are using colors, shapes, arrows or icons, be consistent and make sure it is clear to the reader what all the things in your map represent. Use a legend!

Language

Conceptual frameworks should be logical and commonsensical, so we try to avoid jargon as much as possible. We also try to use lay understandings of words without adding academic nuances. We also try to clarify any potentially ambiguous terms. For example, when we discuss regions in which communities are embedded, we mean the “local” region that surrounds a community rather than “national” regions in the country such as the Southwest, Northeast, etc.

Iterating

It is hard to develop conceptual frameworks without an eraser. Like any good design or develop process, multiple iterations are critical. After our first attempt at sketching, we first ask ourselves: “Does this make sense?”, and “Is this always true?”. If the answer to either question is “No”, then we know we need to make changes. Sometimes we find that we need to add more detail to account for logical variation, in other instances, we remove detail to make the framework more general. Finally, to ensure that our conceptual framework is comprehensive, we ask “What are we missing?” We want the framework to be easy to understand and find that we may need to add additional steps or expand the boundaries a little so that readers are not asking, “But what about X?”

We find it really helps to work with a team of colleagues. If everyone feels comfortable proposing new ideas and critiquing each other, the conceptual framework tends to evolve faster. If you are working alone, then we strongly suggest that you show your drawings to others and get their feedback. It is not uncommon to go through a dozen iterations or more. Do not be surprised if at some point that you start to see the phenomenon in a completely different way. We refer to these as “paradigm shifts” and see them as being a sign that our understanding of the phenomenon is evolving.