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Food Resilience Toolkit

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Contents

About this Toolkit

This toolkit is intended to help community leaders and technical support professionals assess and build food system resilience in their regions. The toolkit is available in English and Spanish and in written and video format. In the introduction, we explore the concept of resilience and the Community Capitals framework and suggest possible indicators of food system resilience.

In Chapter 2, we outline four tools for assessing community advantages and challenges and developing plans to address them. These tools are: asset mapping, focus groups, nominal groups, and strategic planning. While many research techniques can be deployed for resilience building, we have found these four to be especially useful in building purpose-driven, directed initiatives that are responsive to community needs and assets.

Chapter 3 explores the role of policy in building (or obstructing) resilience, and in responding to shocks. We take a birds-eye view of disaster experiences in both Vermont and Puerto Rico and review how political actors responded differently in each region. We use the Multiple Streams Approach as a lens for understanding how policy decisions happen and where there are opportunities to advocate for change.

In the final chapter, we offer lessons from our own resilience research efforts in Puerto Rico and Vermont. We connect our findings with food system resilience indicators and community capitals to offer real-world examples of strengths and vulnerabilities in the face of crisis.

For the video version of the toolkit, please visit the links below:

- English: go.uvm.edu/foodresiliencevideos
- Spanish: go.uvm.edu/resilienciaalimentariavideos

I. Introduction

What is Food System Resilience?

Scholars and practitioners of community development have adopted the term *resilience* to describe a community's capacity to mitigate and recover from shocks. Walker and Pearson (2006) define resilience broadly as the ability to buffer disturbance. Magis (2010) offers a more specific definition, being: "the existence, development, and engagement of community resources by community members to thrive in an environment characterized by change, uncertainty, unpredictability, and surprise" (p. 402). The community development literature proposes a number of dimensions and indicators of resilience, many centering around diversity and redundancy (Newell et al., 2011; Walker & Pearson, 2007). As agriculture and food supply chains have faced accelerating disruptions caused by climate change, pandemic, and socio-political factors, food systems scholarship has likewise embraced the concept of resilience. Tendall et al. (2015) define food system resilience as the "capacity over time of a food system and its units at multiple levels, to provide sufficient, appropriate and accessible food to all, in the face of various and even unforeseen disturbances" (p.19).

For this toolkit, we define food system resilience broadly as the capacity of a community or region to mitigate and recover from shocks to the food system. Like in community development, diversity and redundancy are key dimensions of food system resilience (Behzadi et al., 2017; Béné, 2020; Schipanski et al., 2016; Worstell & Green, 2017). Elements of diversity in production may include number of farms, ownership structure, demographic diversity of farmers, dispersion and vulnerability of farm locations, variety of crops and livestock grown and raised, and diversity of production methods. Redundancy describes the ability of the system to function if one part is compromised. In food production, redundancy of equipment and people are of

particular importance—can the farm continue operation if a tractor breaks down, or if the farmer is sick or injured? Diversity and redundancy in processing and distribution can be measured by the number of different products, entities, and paths by which food travels from producers to consumers. Other food system resilience indicators suggested by the literature include sustainable agricultural practices (Schipanski et al., 2016; Worstell & Green, 2017); independent and local food supply chain actors (Baum et al., 2015; Schipanski et al., 2016; Worstell & Green, 2017); strong relationships in the food supply chain (Béné, 2020; Worstell & Green, 2017); access to financial resources (Béné, 2020; Tendall et al., 2015); social and economic equality (Béné, 2020; Borges-Méndez & Caron, 2019; Schipanski et al., 2016); and creativity, flexibility, and transformability in the face of change (Béné, 2020; Béné & Doyen, 2018; Borges-Méndez & Caron, 2019; Schipanski et al., 2016; Tendall et al., 2015; Worstell & Green, 2017, 2017).

The importance of community and food system resilience has risen to the forefront as recent events have revealed that the U.S. is vulnerable in the face of shocks. Many of these events have been caused or worsened by climate change (like Hurricane María in Puerto Rico and 2021 power outages in Texas). Alongside increasingly frequent natural disasters, the COVID-19 pandemic caused widespread product shortages, economic volatility, and a sharp increase in food insecurity (Béné, 2020; Niles et al., 2021). Yet building system resilience is important even in times of stasis: the qualities that make a resilient food system can bring a host of social, economic and environmental benefits in the absence of shocks and adversity.

Community Capitals

Our team used the Community Capitals model developed by Flora et al. (2004) as a lens for understanding different contributors to community and food system resilience. The

framework describes seven community capitals: natural, cultural, human, social, political, financial, and built. Magis (2010) explores how investing in, developing, and improving these seven capitals can increase community resilience. It is evident that each of these capitals is key to reliable food production and access as well. Food system resilience requires a healthy agro-ecosystem with fertile soil (natural), the heritage and tradition of healthy food ways (cultural), the knowledge to effectively grow, process, distribute and prepare food (human), the capacity and will to collectively address problems (social), sound and transparent policies which support food system resilience and broad public participation in governance (political), profitable businesses paying livable wages (financial), and the equipment and infrastructure to grow, process, and deliver food (built).

Through reviews of the literature and brainstorming with colleagues at UVM, UPRM, and Clark University, we mapped food system resilience indicators to the community capitals model below:

- Natural capital
    - Fertile farmland
    - Ecosystems services provided by agriculture
    - Clean water and healthy fisheries
    - Stable climate
- Cultural capital:
    - Regional, cultural, and health-promoting foodways
    - Credible leaders and community champions
    - Food citizenship ethos
- Human capital:
    - The labor and management capacity to produce and handle diverse foods
    - Adaptability of the food supply chain workforce
    - Communication skills
    - Availability of technical assistance
- Political capital:
    - Policies promoting local purchasing
    - Regulations and adequate enforcement to protect workers, waterways, farmland, food safety, and more.
    - Social safety nets ensuring universal access to sufficient and appropriate nutrition
    - Strong land tenure

- Social capital
    - Trust within and between food systems companies, organizations, and actors
    - Working partnerships and relationships up and down the food supply chain
    - The ability and willingness of food supply chain actors to share information and skills
- Financial capital
    - Credit access
    - Emergency funds
- Built capital
    - Food and farm business equipment and infrastructure able to handle a diversity of products and adapt quickly to change
    - Transportation infrastructure
    - Reliable utilities

II. Tools

Asset Mapping

This section explains how to conduct asset mapping in a food systems context. We selected this topic based on the findings of 2019 focus groups with anchor institutions and technical assistance providers in New England. Focus group participants identified asset mapping as an essential tool for developing robust local procurement programs and overcoming common challenges.

Focus Group Findings

In the fall of 2019, we conducted four in-depth focus groups with hospitals, universities, K-12 schools, and technical assistance providers (explored in more detail in Chapter 4). We asked participants what tools had set up their local food procurement program for success. Participants found asset mapping useful for establishing new relationships within the local food system and overcoming institutional challenges. Participants saw asset mapping as a flexible structure for gathering and organizing information about the surrounding community and its resources. These maps often cover a wide range of assets, including physical, human, and community resources. Asset mapping allows organizations to make the best use of the resources within their communities by identifying “low-hanging fruits,” or the most accessible resources. The mapmaking process can also inform and establish new relationships between individuals, institutions, and organizations.

Asset Mapping Philosophy

Asset mapping is a strength-based approach to development that identifies existing resources within a community that may be useful to the mapmakers' work. Compared to needs-based approaches to development, which focus on what a community or organization lacks, a strength-based approach empowers organizations to recognize their full capacities, access resources available within their communities, and establish new relationships. The asset mapping process is enhanced by involving multiple stakeholders who bring different perspectives to the process. Some mapping processes are participatory, bringing together numerous stakeholders and community members to work towards a systemic goal. Other asset maps are focused on the goals of a small group of stakeholders, but these still benefit from a wide range of expertise.

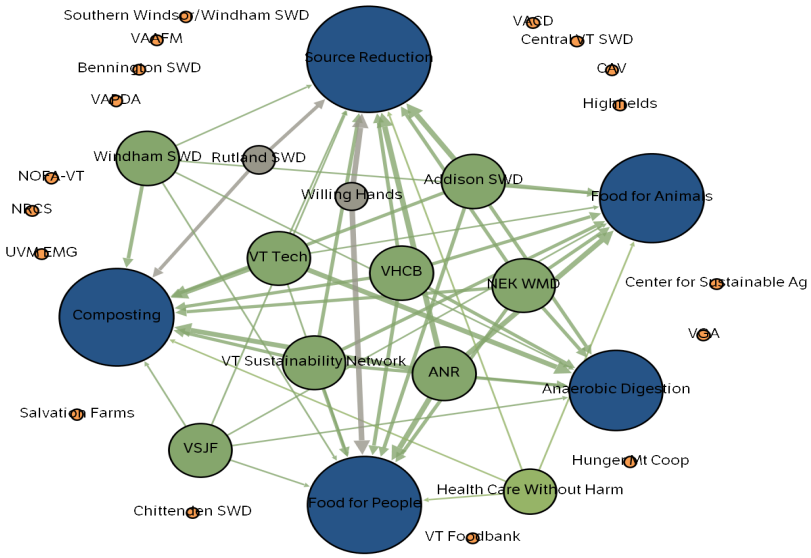
While asset mapping focuses on existing resources, the reality is that communities and local food systems do not always have access to all the resources they need to thrive. An asset map can also inform needs assessments, which identify the gaps in knowledge and resources preventing an organization from meeting its goals. Identifying barriers to success can inform future decisions and suggest where to allocate resources within the organization and greater community. Asset maps identify resources and opportunities available in the short term and locate what gaps need to be filled in the long term.

Asset Mapping Method

Asset mapping is helpful for creating a new program or initiative, but it can also be used to improve existing programs or to find new community engagement opportunities. The mapping process is intended to build a strong understanding of community resources and help develop connections between people, institutions, and organizations. Asset maps vary in complexity

based on the user's needs. The simplest kind of asset map is an organized list of community resources. However, grouping similar resources into a concept map (Figure 1) or mapping resources geographically are popular methods of organizing information to show the relationships between resources.

Figure 1



Note. Example of an asset map. This image was created as part of a Vermont Farm to Plate Food Cycle Coalition Task Force effort to improve organics diversion and food rescue in the state (Sagui & Claro, n.d.).

Asset maps are used to organize information about many kinds of resources, including:

Physical assets: Buildings, infrastructure, and equipment.
Human resources: Knowledge, skills, relationships, and influence.
Community assets: Citizen associations, local institutions, and nonprofits.
Financial resources: Assets and financial resources available to an organization or community through grants or loans.

The following section will enumerate the steps of creating an asset map. This section uses an example that was brought up in our 2019 focus groups to demonstrate how asset maps can be used to overcome a specific challenge and help establish a new local procurement program.

1. Set Asset Mapping Goals and Objectives

Before investing time and energy in any project, it is essential to understand its intended outcomes. Project goals and objectives guide the asset mapping process. These goals can be broad or focused. Asset mapping can be used to:

1. *Create new programs and inform programming decisions*: An asset map identifies which resources already exist within a community and which are lacking. This information can inform decision making, helping to make the best use of the resources available to an organization and fill needs that aren't currently being met.
2. *Facilitate partnerships and collaboration*: Identifying organizations working on similar issues or that have access to resources your organization needs is a great way to identify potential partners in your community.
3. *Overcome challenges and lack of resources*: Organizations hoping to launch or expand programming initiatives are often hampered by a lack of resources. Organizations may be able to locate these resources within their community rather than developing the assets themselves.

Example: Local Procurement at a Rural School
In the 2019 focus groups, participants used the example of a small rural school that did not have the capacity or facilities for scratch cooking. The school hoped to incorporate more fresh local foods in their school lunch offerings. With limited options for lightly processed fruits and vegetables from their region, the lack of facilities posed a significant challenge. This school might benefit from asset mapping to identify resources and partnerships within the community that could help the school increase local procurement in spite of this challenge.

Note. While setting objectives gives direction to asset mapping, your goals may shift in light of what you learn during the process.

2. Define Community Boundaries

Asset maps must be limited to set community boundary lines. These boundaries need not conform to the geographic boundaries of a town, city, or county. They should represent the communities you are most likely to work or partner with. Without defined boundaries, the mapping process will be overwhelming and the map itself will include too much information to be a useful tool.

School Food Procurement Example: The school in this example is looking for facilities to process fruit and vegetable products aggregated from multiple vendors. In this case a relatively limited geographic boundary would be appropriate. This boundary could potentially include neighboring towns or limit the map to a certain distance from the school.

Note. The appropriate boundary varies depending on the type of asset. If this school wanted to partner with community organizations with the capacity for produce processing and/or scratch cooking, a small boundary would be optimal. If the school were looking for potato farmers in the region the appropriate area would be larger.

3. Involve Community Partners

Involving multiple stakeholders in the mapping process, whether they be members of your organization, representatives of other local organizations, or community residents, can help identify further resources in your community and enhance the quality of your map. Including a wide range of participants with varying knowledge and experience can help illuminate aspects of the community and its resources you may not otherwise know about. Asset maps are a tool designed to foster collaboration and innovation, and the process of making the map is the first step in connecting with resources and organizations in your community. There are many ways to engage community partners. Two common strategies are to establish a diverse advisory panel that participates in the asset mapping process and to collect stakeholder input through focus groups and surveys.

School Food Procurement Example: The school in our example wants to solve a problem that is specific to their organization but alludes to a larger systemic issue: the lack of lightly processed local fruits and vegetables in their region. Because this is a shared problem, the mapmaking process should include diverse members of the school community and representatives of other affected organizations. Specifically, the school should involve other local institutions that serve food, like schools and hospitals, and farmers who are interested in selling their products to this school and other institutions. The participation of these diverse stakeholders would enhance the mapping process and the map itself by incorporating different perspectives and knowledge from the community.

4. Determine Relevant Asset Types

Asset maps can include a wide range of resources, including infrastructure, expertise, funding, and more. Identifying the specific types of assets relevant to your organization, initiative, and objectives brings focus to your asset map. You should only include assets that are aligned with your map's purpose, but your rules should not be so narrow as to limit creative solutions.

School Food Procurement Example: Since the rural school is using an asset map to identify resources for processing local fruits and vegetables, they may want to include the following asset types:

- Human resources: The school will need people who know how to process fruits and vegetables, and they will need to leverage connections with community members who can help them achieve their goals. School staff may have connections to other area school dining services that do have the capacity and facilities to prepare fresh, whole produce and might be able to do some light processing for our school on contract.
- Community resources: Other institutions or food hubs may have the ability and interest to do some light processing on our school's behalf or may be experiencing the same problem themselves. These organizations are potential partners in this work.

5. Identify and List Assets

Once you have determined what types of assets to include in your map, it is time to figure out if and where those resources exist in your community (defined in step two). Begin by listing

all the assets known to you and your mapmaking partners. Involving community partners is particularly important at this juncture, as they may bring new knowledge to the table.

Now that you have identified all known community resources, the discovery process can begin. Numerous information sources can aid in the search for community resources, like city directories, community resource guides, local newspapers, neighboring businesses, asking friends and colleagues, and conducting online searches. Collect relevant information about the identified asset: location, the types of services offered, contact information, and available resources, like potential grants, or equipment they have that may be of use to your organization.

If your asset map includes individual human resources, you may want to collect more information about the individuals' skills and experiences. If the individuals' abilities are not well known, you can use a simple survey or interview to gather more information.

School Food Procurement Example: After identifying known community resources, the rural school may want to survey or interview their foodservice employees to learn more about their ability to process fruits and vegetables. They should also look into the capacities of other local facilities and institutions by checking local directories, performing online searches, or contacting these organizations directly.

6. Organize and Map Assets

When you have completed the information collecting process, you can organize your findings into the final asset map. What the final map will look like depends on the objectives determined in step one and how you plan to use the map. Plotting the information geographically is more time consuming than other options but adds a level of detail about the relationships between resources. Geographic mapping can be accomplished with computer software, by printing and labeling paper maps, or by hand drawing community maps, depending on the level of specificity required. Another popular way to organize this information is as a concept map,

which groups similar resources together and can show which types of assets are available within the community and which are lacking.

School Food Procurement Example: The rural school would be best served by organizing the information geographically to figure out which produce processing or scratch cooking facilities are close to the school.

7. Utilize and Share Results

The final steps in the asset mapping process are to use the map to inform organizational decisions and to share your results with community partners. Sharing the map with partner organizations allows them to use the information, demonstrates the importance of their involvement in the process, and facilitates

School Food Procurement Example: Once the map is complete, the rural school can share it with community partners and start contacting the facilities identified on the map that may be able to process local fruits and vegetables. Suppose the school did not identify any appropriate resources in this process. In that case, the asset map could also be used to encourage local decision makers to increase produce processing capacity in the region.

Focus Groups

What is a Focus Group?

The focus group is a qualitative research technique that seeks in-depth understanding of the topic at hand. It approaches the subject within its own context and from the perspective of the people who experience it. Like other qualitative research methods, it uses a rigorous and systematic methodological approach to give voice to people directly affected by the subject matter.

This section aims to familiarize the reader with the focus group technique and build the necessary skills for conducting and leading focus groups.

The History of Focus Groups

During the 1930s, sociologists realized that trying to imitate natural science methods in their field was ineffective (Krueger & Casey, 2015; Stewart & Shamdasani, 2015). Previously, social sciences had tried to make it possible to isolate variables by conducting interviews with pre-determined scripts and closed questions (Krueger & Casey, 2015; Stewart & Shamdasani, 2015). In this approach, the researcher takes a strong leading role that tends to pre-direct and, in some cases, to predetermine the framework of possible responses. Sociologists were interested in developing less directed and researcher-controlled methods. New strategies and methodologies such as non-targeted interviews (using open-ended, open-closed, and unstructured and non-standardized questions) turned more control over to the research participant. This offers participants the opportunity to focus on what is important to them and share experiences and attitudes that the researcher may otherwise not have known to ask about.

In the 1950s, in an attempt to lower research costs, Merton, Fiske, and Kendall conducted a study to identify the most efficient interview methods. They found that people were more

willing to share information (including sensitive information) in environments where they felt safe were surrounded by people who resemble them. The resulting book, *The Focused Interview* (1956), became the pioneering work in the development of the Focus Group methodology.

Qualitative Methods versus Quantitative Methods in Social Investigations

The fundamental purpose of all scientific research is to generate knowledge in a systematic, rigorous, and analytical way. Any scientific finding and investigative conclusion must be explicit, available for scrutiny, and ratified by peers. Both qualitative and quantitative methods seek to produce reliable data, to systematically organize and analyze these data, and to share findings with the academic community for consideration. In short, both qualitative and quantitative methods pursue new and better knowledge.

What, then, are the differences between qualitative and quantitative research methods? The fundamental difference is that qualitative research generates "textual" (i.e., non-numerical) data while quantitative research generates "quantifiable and measurable" (i.e., numerical) data. We present the following table summarizing these differences.

Quantitative Methods	**Qualitative Methods**
Variables are assigned numeric values.	Variables are assigned a descriptive value (in words).
Based on predetermined and standardized categories.	Does not set predetermined categories and instead encourages documentation of the diversity of experiences and perspectives.
Focuses on specific and controlled knowledge (i.e., "controls" variables).	Focuses on the search for real knowledge (i.e., the complex).
Focuses on the repetitive, the prudent.	Collects the varied, the diverse.
Focuses on what is succinct or concise.	Focuses on (and is rich in) the details.
Often aims to produce findings generalizable to a broad population.	Often aims to produce detailed findings on specific people and cases.

Neither qualitative nor quantitative research is superior to the other; each approach has its own strengths and limitations. And while different, they are not mutually exclusive. Today, most

scientific studies in search of interdisciplinarity and transdisciplinary bring together qualitative and quantitative researchers, and some researchers even do both.

Focus groups belong to an area of qualitative research known as ethnomethodology. Ethnomethodology is a branch of sociological research that aims to answer the question "How do people make sense of their daily activities, so that they can behave in a socially acceptable way?" Ethnomethodology focuses on the ordinary, the routine, and the details of daily living. It is part of a recent sociological trend that Alain Coulon (1995) describes as: “The sociology that strives to understand, now acquires greater importance over the sociology that intends to explain” [Translated from Spanish by the authors of this guide].

Operational Definition of a Focus Group

Powell and Single (1996) offer the broadest and most direct definition of a focus group, being:

> ... a group of individuals selected and convened by researchers in order to discuss and comment on their personal experiences on a topic that is of importance to an investigation.

A more complete definition by Krueger & Casey (2015) is:

> A focus group is NOT just taking a group of people and putting them to talk. A focus group is a special type of group in terms of purposes, size, composition, and procedures. The purpose of conducting a focus group is to better understand how people feel or think about a topic, idea, product, or service. Focus groups are used to collect opinions. [Translated from Spanish by the researcher of this guide]

Focus groups were developed in recognition of the fact that many decisions people make are made in a social context (i.e., in constant consultation or discussion with other people). We know that when we are with the family, among friends or "within our little groups" we dare to say things that we would not in more formal scenarios. Focus groups are used to determine how people raise, refine, defend or modify their ideas, ways of thinking, and knowledge by being exposed to the immediate and direct reaction of a group of peers.

How do you conduct a Focus Group?

The researcher interested in conducting focus groups establishes the specific topic and a guide of questions of interest. They conduct a group interview with a small number of people (usually 10 or less) on a specific topic. The researcher serves as a moderator to ensure the participation of all the people in the group (although you do not necessarily have to impose equal time on all participants) and prevent the discussion from being deflected. It is recommended to have an assistant handle the technical aspects (i.e., operate the sound recording equipment, take notes, and keep track of time).

General Protocol of the Focus Group

<u>Before leaving for the meeting location</u>

- The work team (Moderating Researcher, Moderator Assistant, other researchers) will gather at the indicated time at the place of departure.
- Each team member must bring with them the equipment and materials in their charge.
- The research team should plan to arrive at the location at least one hour before the interview.

<u>Before starting the Focus Group</u>

- Take attendance
- Give each participant a name tag
- Request consent forms

Introduction to the Focus Group

- Welcome participants
- Moderator introduces themself and their colleagues
- Explanation of the purpose of the Focus Group.
- Explanation of the Focus Group process
  - General rules
  - Recording and transcription
  - Confidentiality Form
  - Use of data

Focus Group Discussion

- Moderator guides group using the Question Guide.
- Closing and acknowledgments.
- Maximum duration 2 hours.

At the end of the Focus Group

- *Debriefing meeting*–the study staff convene for a brief discussion of what they observed and heard in the focus group.
- Save the audio recording to the designated location.

Moderator Researcher's Guide

The moderator's guide is a document that the focus group moderator will read before starting the focus group. The guide welcomes participants, explains the general purpose of the meeting, and discusses the focus group process. The guide establishes the atmosphere of cordiality and rigor of the activity, the basic rules of the process, and the trust and encouragement for participation. The following is an example of a moderator's guide:

1. Welcome

Good [morning/afternoon/evening] and welcome everyone! My name is [moderator's name] and I am [mention position and the institution you represent]. Thank you to each and every one of you for taking your time to be with us and collaborate with [name of institution] in this activity.

I am accompanied by [name and position of the moderator assistant] and [name of other observers if any]. They are here with us to help us in the process of collecting the information that you are going to share with us today.

2. Purpose of the Focus Group

The purpose of today's meeting is to hold a discussion group to learn what you think about [general research topic]. For us it is very important to know the opinion of [referring to the group of participants] before preparing [the materials or plans to be developed].

3. Focus Group Process

How are we going to do it? I'm going to be asking a few questions and listening to everyone. All opinions are important and valuable. Don't worry if your opinion differs from someone else's in the group. We want to hear all opinions. Since we don't want to miss any comments, we're going to be recording the focus group. You already gave us your approval to record in the letter you signed. When we transcribe the recording, we will not use any of your real names in order to maintain confidentiality. The people in charge of this project will store the recording and transcription, which will be used to [explain the use of the data].

It is important that each participant speaks loudly and that only one person speaks at a time so that we can understand the recording. We want everyone to have the opportunity to participate. If there is something you want to share privately with us, you can do so at the end of the activity. If at any time someone does not want to continue participating they can leave the group and this will not affect them at all. Please silence your cellphones to avoid unnecessary interruptions.

Okay, let's get started!

Assistant to the Moderator Protocol

The responsibilities of the assistant to the moderator should also be established prior to the focus group interview. We have outlined some possible assistant responsibilities below.

Assistant Responsibilities

- The assistant will be in charge of securing and transporting necessary equipment, such as:
  - Audio recorder and extra batteries
  - Attendance and consent sheets
  - Name tags
  - Pens and markers
  - Notebook

Upon arrival at the meeting location, the assistant will:

- Ask the institutional contact where the focus group will be held
- Collect the Consent Sheets and ensure that the participants have completed them.
- Ensure that all participants sign the attendance list.
- Ask participants to write only their first name on the name tag. Participants may also use their nickname or pseudonym to preserve their anonymity. The assistant will number the nametags so that they can match pseudonyms to the number that corresponds to the person on the attendance list.
- Make sure that the meeting room is set up for a round table meeting.
- Sit across from (facing) the moderator.
- Verify that there are no noises or sounds that may affect the recording and discussion.
- Test the recorder and ensure that the audio is heard properly from all assigned seats.
- Make an initial recording indicating the date, the location and type of participants before beginning the focus group interview.

During the Focus Group, the assistant will:

- Keep track of time
  - Will instruct the moderator subtly (like by using a card) when there are 5 minutes left for a question and when the next question is 1 minute away.
  - Will instruct the moderator subtly when there are 10 minutes, 5 minutes and 1 minute left to conclude the focus group.
- Not participate in the discussion and will avoid non-verbal expressions (facial gestures, head movements, among others).
- Be in charge of monitoring the recorder periodically to make sure it is working properly.

When Taking Notes

- Will indicate on the first page: place, date and time of start and end of the focus group.
- Will take the notes as faithfully as possible.
- Will indicate the quotes in quotation marks.
- Will identify the questions by their number.
- Will identify, at all times, subjects by the number on their nametag. It will leave space between the comments of one subject and another.
- Will write down non-verbal communication of the subjects that can contribute significantly to what is expressed.
- If the assistant has any comments related to what happens, he or she will indicate it in square brackets [ ].

Question Guide

The question guide should consist of five or fewer open questions. These should encourage the participant to share their experience and should be general enough to allow the participant to determine what information to offer. At the same time, questions need to be precise enough to establish the topic to be investigated. Every question must have at least one follow-up question that the moderator will read only if the initial question does not stimulate or generate group participation. Each question must have a time limit established that allows the efficient administration of the focus group, but with some flexibility to allow full discussion of the topic to be studied. Figure 2 shows an example of a question guide.

Figure 2

FOCUS GROUP

Question Guide: Covid-19 Risk Management

Time estimate (max.)	Questions:
5-10 mins	1. (Icebreaker question) In one word, how have you felt during this period of crisis caused by the Covid-19 pandemic?
10 mins 5 mins 5 mins	2. Based on your experience with Hurricane María, the earthquakes, and Covid-19: What is the biggest lesson you have learned? What do you know now that you wish you had known before? Is there anything you still need to learn to prepare for future threats?
10 mins 5 mins 5 mins 5 mins	3. What resources (human, equipment, infrastructure, partnerships, etc.) would you need to start producing again, or to address a future disaster? Why would you need these resources? What would you use them for?
10 mins 5mins	4. If you could talk with public policy makers: What laws, regulations, or activities would you recommend for disaster preparedness and for starting production after a disaster? How do you think things would improve if these laws or regulations existed?
10 mins 5 mins	5. In the case of another emergency like Hurricane María (that could last weeks or months): Where and how would you focus your efforts on your farm? Why?
Total: 1 hour 25 minutes	

Consent Form

The consent form is a formal document that tells potential participants about the study and the institution and research behind it and shares contact information for the study lead in case of any doubts or concerns. The consent form must also inform potential participant of their rights, including their right not to participate or to stop participating whenever they want without consequences. It must share how the identities of participants will be protected and how the recording will be used and who will have access to the recording, transcription, and other data.

The consent form must be signed and dated by the person giving their consent. If the investigation involves children, consent should be given by a parent or legal guardian. The research team should also explain the study purpose and process to the minor in language adapted to their level of understanding and ask for their consent. Figure 3 shows an example of a consent form.

Figure 3

RISK MANAGEMENT AND EMERGENCY PREPAREDNESS IN PUERTO RICO
COLLEGE OF AGRICULTURAL SCIENCES
Department of Agricultural Economics and Rural Sociology
University of Puerto Rico, Mayagüez Campus

INFORMED CONSENT FOR RESEARCH PARTICIPANTS

Dear Research Participant:

The University of Puerto Rico at Mayagüez (UPRM) is working with Puerto Rico's meat industry to identify vulnerabilities caused by the Covid-19 pandemic, to seek ways to mitigate these vulnerabilities, and to work with new and small farmers to generate positive change. To this end, we invite you to a discussion group where we will talk and ask questions about Puerto Rico's disaster preparedness. This will contribute to the development of educational materials for new farmers in Puerto Rico.

The discussion will be recorded on audio and video so that we can hear the contributions of each member of the group. The information we collect will be confidential and we will not use research participant names in the discussion transcription nor in reports on research results. If you do not consent to be recorded, we will excuse you from the meeting. The discussion group will be held virtually on the agreed upon date. Your participation is completely voluntary, and you may cease participation at any moment during the group discussion. If you have any concerns, please reach out to the contact person indicated below.

If you would like to participate in this study, please provide your name, signature, and date below as indicated. Thank you for your collaboration.

X	X	X
Name	Signature	Date

Contact: Dr. Robinson Rodríguez Pérez, PhD., Principal Investigator
Professor of Rural Sociology, Agricultural Extension Service, UPRM
Telephone: (787) 832-4040 ext. 3860, Email: robinson.rodriguez1@upr.edu

Protocol for the Transcription of Focus Groups

The transcription process is time-consuming, but it is an essential step to produce data for rigorous analysis and must be carried out with care and rigor.

A focus group transcript is NOT a summary, minutes of a meeting, an edited and corrected document, or a document based on field notes. *The transcription of a focus group is* the word-for-word written reproduction of the discussion that occurred in the focus group, based on the audio recording (Krueger & Casey, 2015).

The establishment of a consistent and clear transcription protocol is essential for the transcribed document to be an agile and accurate working instrument. This will allow the information to be navigated and analyzed without major difficulties.

How to Create a Transcript?

- Start by typing the file name, place, date, and start and end time of the focus group.
- Transcribe the recording *verbatim:* this means as faithfully as possible (i.e., as heard).
- Use the following abbreviations Q-question, S-subject, M-moderator.
- Identify the speaking participant by their number.
- Be careful to distinguish which person is speaking.
- If you have any comments related to the transcription, indicate it in square brackets "[ ]".
- If what the person said cannot be determined, write [INCOMPREHENSIBLE].
- DO NOT edit, fix, or grammatically correct anything.

Conducting Multiple Focus Groups

Depending on your project and the population you serve, you may want to conduct multiple focus groups. Standard best practice for conducting multiple focus groups is to group like people together, as participants will speak more openly amongst those who share certain characteristics and challenges (Lindlof & Taylor, 2011). There are many ways to divide up groups; for instance, in a study of farmers, you may choose to group farmers by what they farm

(meat, dairy, produce, grain, etc.), how they farm (conventional, organic, agroecological practices), or by other characteristics like age, gender, race or ethnicity, and whether they are from a farming family or are a new farmer. The right choice depends on your project, the questions you are interested in, and scheduling constraints.

Analyzing Data

There are many ways to analyze and understand the data you obtain in your focus group. Most involve assigning participants contributions to different categories to see what themes emerge across all focus groups. One popular model is the grounded theory approach developed by Glaser and Strauss (1967). In grounded theory, the researchers develop the categories from the data itself, and continue to change and adapt the categories throughout the data collection and analysis process (Lindlof & Taylor, 2011). The researchers assign categories (also called codes) in three stages:

1. Open coding: In this stage, read through all the focus group transcripts and assign initial codes to your data. If multiple people are analyzing the transcripts (as is best practice), compare and discuss your codes. Begin to develop a *codebook* to collect and define your codes and count how many times each code appears in the data. Once you have read through all transcripts and developed your codebook, you may want to return to the transcripts you read first and see if any codes you developed later apply there. You will have many open codes.
2. Axial coding: Look at all of your codes together and see how they connect. Do any of your codes fit together into larger themes? For instance, if you have codes for electricity,

water, roads, and storage facilities, you may group them together under the axial code "infrastructure." In this stage, you should identify around 5 core analytic concepts.

3. Selective coding: What 1-2 overarching themes capture your research results? Now that you have systematically read and analyzed each focus group transcript multiple times, are there any major concepts that unite the discussions?

If you have access through your institution, or if qualitative data analysis is a major component of your work, you may want to use a specialized qualitative analysis program like NVivo for the coding process. However, there are also many budget-friendly ways to code your focus group results, like marking up printed transcripts with colored pens or post-its, or by using the comment function of word processing programs like Microsoft Word.

A Few Closing Words

Focus groups are a research tool that can allow us to better understand not only the phenomenon we are interested in studying, but also the people who are affected by it. It is a cost-effective, fast, and reliable method of obtaining high-quality data that will allow us to solicit the input and work with the people in the community. With the material included in this guide you are ready to design and carry out a focus group study, produce transcripts, and analyze results.

Nominal Groups

What is a Nominal Group?

A **nominal group** is a qualitative research technique that facilitates the development of ideas, the analysis of problems, and the establishment of agreements. The analysis process is highly structured to allow for participants to reach several conclusions and come to consensus during the meeting.

This methodology was originally introduced by Delbecq and Van de Ven (1975; 1971) in an effort to streamline group decision-making processes. They sought to overcome difficulties in group research techniques, as well as to speed up the decision-making process.

Main Objectives of the Nominal Group

- Identify problems and solutions in a structured and systematic way.
- Ensure equitable participation among the group.
- Incorporate basic arithmetic voting techniques into the group decision process.
- Build group consensus (i.e., achieve a majority vote without ignoring the principles of minority groups).

Advantages of the Nominal Group

- Allows participants to present ideas without judgment
- Encourages consensus building
- Encourages participation
- Gives equal voice to every participant.
- Generates ideas in a short amount of time (cost and time effective).
- Solution focused

Carrying out a Nominal Group

This tool is highly structured to ensure the collection of data and ideas in a systematic way. For this reason, the steps for developing and managing a nominal group have a logical construction.

Necessary Materials

- Paper and pencil for each participant
- Whiteboard or flip chart
- Markers for the whiteboard or flipchart

Nominal Group Logistics

The nominal group should take place in a group meeting room where 10 participants can sit in a circle or around a round table. This arrangement allows for each participant to maintain direct eye contact with others to facilitate interaction.

The moderator will begin by welcoming the participants and explaining the purpose of the activity.

Nominal Group Steps

- **Step 1:** The moderator will briefly describe the area of interest or the problem to be addressed and then begin a brainstorm. During this exercise, participants will express the first thing that comes to mind about the topic.
- **Step 2:** Each participant will write down ideas for the area of interest (no more than 5). This work should be done individually and in silence. Once complete, participants will read their ideas aloud one by one, and the moderator will write them down on the flipchart or whiteboard. No discussion will be allowed in this step.
- **Step 3:** Once all the ideas are on the board, the group discussion phase begins. The purpose of this discussion is to clarify ideas; participants will not state agreement or disagreement. Participants may ask about details or intended meaning of the ideas on the board. Phrasing of an idea will only be changed if the originator agrees. If multiple participants proposed similar

ideas, they can agree to consolidate them into one, or group them together under the same category.

- **Step 4:** Participants will hold a preliminary independent ranked-choice vote. Participants will choose three ideas from the board in order of priority, awarding three points to their first priority idea, two points to their second choice, and one point to their third choice.
- **Step 5:** Participants take a recess while the moderator and research team tabulate the results of the preliminary vote. After the break, the moderator will present the election results to the group.
- **Step 6:** Participants will discuss the election results as a group to see if they are all satisfied with which ideas were prioritized. If all are in agreement, they can ratify the vote. If anyone still has doubts or if the group's priorities need further clarification, they can conduct a final vote (either out loud or by secret ballot). Remember that the goal of the nominal group is to reach consensus, being a majority decision where the minority (i.e., those who did not prevail) can live with the result.
- **Step 7:** The group announces their final decisions and proposes an action plan. Set a future meeting date if applicable and thank the participants for their time.

Figure 4

Diagram with the steps of a Nominal Group

Final Words

Nominal groups are a research tool that allow researchers to establish a dialogue with and between the members of an organization or group of interest. It is a cost-effective, fast, and reliable method for reaching agreement and building consensus among the members of a community. With the material included in this guide we are ready to design and carry out a nominal group. Good luck!

Strategic Planning

What is a strategic plan?

A strategic plan is an instrument we use to decide in advance what path we want to follow. It allows us to answer the below questions, which are fundamental to any project.

- What should we do?
- How should we do it?
- When should we do it?
- Who should do it, and with what collaborators?

What are the benefits to writing a strategic plan? The writing process leads us to:

- Examine the organization
- Give direction to the initiative
- Define what we want to do in realistic terms
- Give structure to our ideas
- Cover all important areas
- Think ahead about what problems or difficult situations we might encounter
- Communicate our ideas effectively
- Imagine a better future than the present we live in

Why do so many grant applications require a strategic plan? Funders want to:

- Get a clear idea of the applicant's economic, social, and environmental state
- Understand what the applicant aspires to do
- Identify what goals the funder shares with the grant applicant
- Involve other people and institutions (like universities and government agencies) in the project's development
- Determine how much time, money, and other resources are necessary to achieve common goals

REMEMBER: To attract attention and support from state or federal government and other collaborators, you will need a strategic plan.

What are the components of a Strategic Plan?

SWOT Analysis

SWOT analysis is a tool that allows a group to reflect on their **strengths, weaknesses, opportunities,** and **threats**. It helps outline how the organization is working and how it can improve (see Attachment A).

- Strengths (internal)
  - What do we do well?
  - What are we good for?
- Weaknesses (internal)
  - Where do we fall short?
  - How can we improve?
- Opportunities (external)
  - What new things should the organization start doing?
  - What in our surrounding environment can facilitate or promote what we want to do?
- Threats (external)
  - What endangers the existence of our organization?
  - What in our surrounding environment might challenge or impede us from achieving our goals?

Once the organization understands what opportunities and obstacles are ahead, it can focus on outlining its reasons for existence. Generally, these reasons are include both the philosophical and the practical. The philosophical reasons are expressed in the strategic plan through the organization's **values** and **vision**, while the practical reasons are delineated in the **mission**, **objectives**, and **goals** (refer to Attachments B and C).

Organizational Values

To establish the values of our organization, we must answer the following questions:

- Why do we exist?
- What is important to us?
- What do we want to be recognized for?

These questions help us characterize the institution or organization we want to develop. The values should take the following form:

- There should be no more than five values on the list.
- Each value should be a declaration, not just a single word.
- The values should be deep and significant.

List of common ethical values				
Friendship	Coherence	Improvement	Objectivity	Affability
Loyalty	Respect	Comprehension	Honesty	Sensitivity
Sincerity	Prudence	Hard Work	Punctuality	Communication
Fulfillment	Self control	Responsibility	Judgment	Will
Resilience	Sociability	Generosity	Family	Reflection
Humility	Character	Dedication	Decency	Compassion
Sacrifice	Optimism	Magnanimity	Learning	Vocation

Vision and Mission

Your vision propels your initiative into the future. The vision statement presents what we want to be and to what we aspire. Community initiative visions should have three elements:

- What do we want to be?
- What do we aspire to do?
- Where do we want to land?

Examples of Vision Statement Language:
- "We envision an efficient operation that…"
- "We will be the foremost…"
- "We aspire to unite all of the…"
- "We will improve the condition of…"

The vision statement should be:

- Written in the future tense
- Visualizable
- Challenging for the organization to achieve

Once the vision statement is complete, we can move onto the practical part of the strategic plan by establishing our **mission**. The first step is to clarify what is important to each member of your organization. This way, everyone can familiarize themselves with what motivates them and what they hope to achieve in life and in this organization. The mission is the

axis of your initiative. All of your actions and decisions should be directed towards achieving your mission. A mission should address three guiding questions:

- Whom do we serve?
- What needs does our initiative address?
- What will we do to address these needs?

The mission should be:

- short
- memorable
- inspiring

Examples of Mission Statement Language:
- "We offer the best…to our members"
- "We offer a secure environment to participating families"
- "We lead our sector for the benefit of our clients"
- "We provide essential services to farmers."

Objectives

Objectives express in a general form what the organization proposes to do and how we propose to do it: **they give us direction**. Objectives should be affirmations or declarations and should be driven by measurable or quantifiable verbs (i.e., add, cut, grow, reduce).

Objective Examples:
- "We will position ourself as the foremost….in the market"
- "We will create secure jobs with competitive salaries"
- "We will develop a brand that leads in visibility and sales"
- "We will build several high-tech installations to promote…"
- "We will expand our presence in…"

There should be several benchmark goals along the way to achieving each objective:

- **Short term**: Acquire knowledge or skills, change attitudes
  - What new things will we learn?
  - What skills do we need?
  - What trainings, courses, or experiences will help us improve?

- **Medium term**: Put this new knowledge into action, change behavior
  - What actions and attitudes are we changing?
  - What new knowledge or skills are we implementing?

- **Long term**: Change structures, improve quality of life, transform living conditions
  - Think about the biggest or most significant change we can hope to make.
  - At the end, what will we have achieved?

Goals

Goals help us assess if we are getting closer to or further away from our objectives. They provide a more precise way to measure the degree of change we have made and what we have achieved. Goals should follow the **SMART** model (refer to Attachment A).

- ***Specific***
- ***Measurable*** (and documentable)
- ***Audience*** (written with your organization's audience in mind)
- ***Realistic*** (achievable)
- ***Time-bound*** (can be met in a set period of time)

Attachments

A. SWOT Analysis
B. Values, Mission, and Vision
C. Goals and Targets

Attachment A: SWOT Analysis

SWOT Analysis	
Strengths (internal) **1.** **2.** **3.**	**Weaknesses (internal)** **1.** **2.** **3.**
Opportunities (external) **1.** **2.** **3.**	**Threats (External)** **1.** **2.** **3.**

Attachment B: Values, Vision, and Mission

Creating a Strategic Plan	
Values	1. 2. 3.
Vision	1. 2. 3.
Mission	1. 2. 3.

Attachment C: Objectives and Goals

Project Title: _____

Objective: _____

Timeframe:
_____Short
_____Medium
_____Long

Goals (SMART)	Activities What will we do?	Resources Who will do it? What will we do it with?	Anticipated Result What will we achieve?

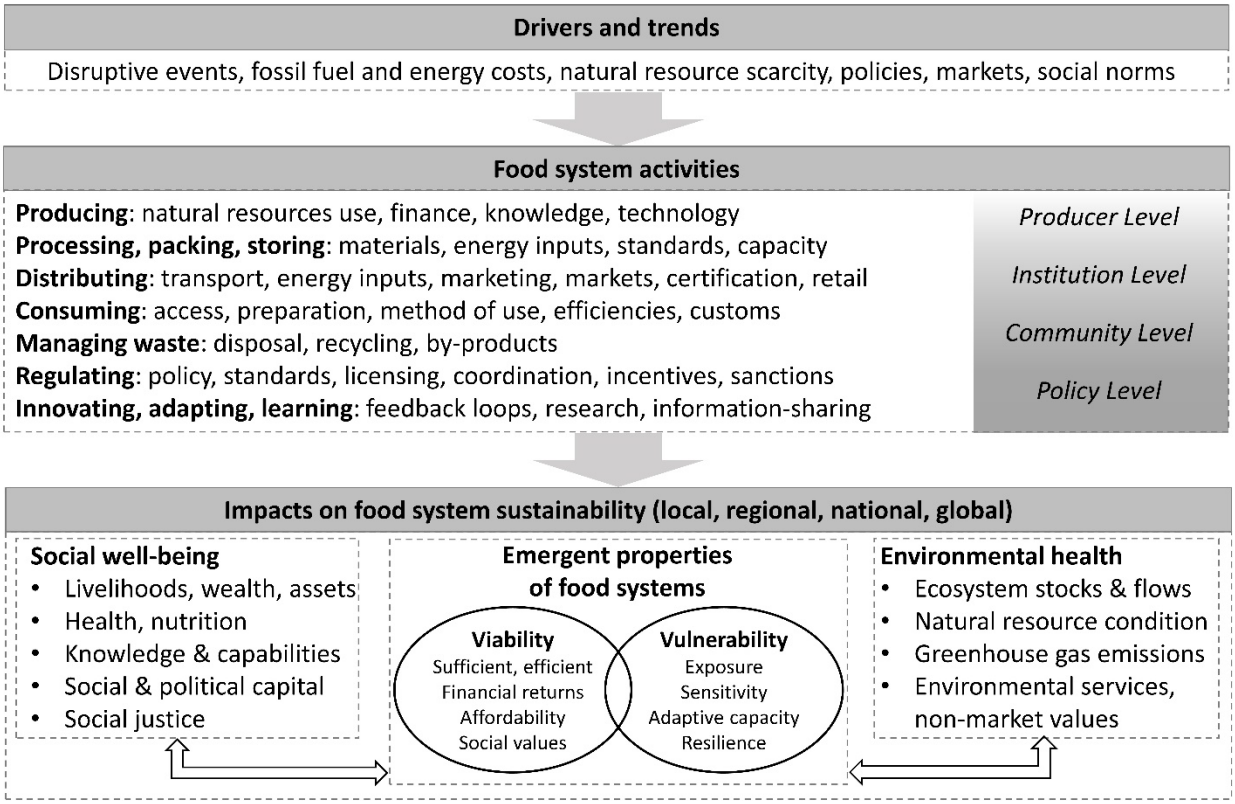
III. Taking Action: Multiple Streams for Policy Change

Tropical Storm Irene (2011) in Vermont and Hurricane María (2017) in Puerto Rico highlighted the need for enhanced disaster preparedness and comprehensive resilience planning in the face of climate change. But realizing meaningful public policy changes in support of long-term system resilience (going beyond short-term disaster response) requires an understanding not only of risks and vulnerability, but also of the policy process for creating lasting change. In this chapter, we draw from the distinct experiences of Vermont and Puerto Rico in long-term disaster recovery and resilience building to explore barriers to and possibilities for positive policy change.

Factors Contributing to Food Systems Outcomes

Food systems are complex. Disruptions and decisions at one point in the food supply chain can have wide-ranging impacts up and downstream. Stakeholders along the chain may also have competing interests. This complexity can make it difficult to design and pass policies supporting food system resilience. It is possible, however, to break out food system activities along the supply chain and see how factors at the producer, institution, community, and policy levels can impact food system outcomes, as illustrated in Figure 5. And when particular food system vulnerabilities are exposed in times of crisis (such as damage to production, transportation, or processing infrastructure) diverse food system stakeholders can unite around common goals for policy reform.

Figure 5



Translating Attention into Goals

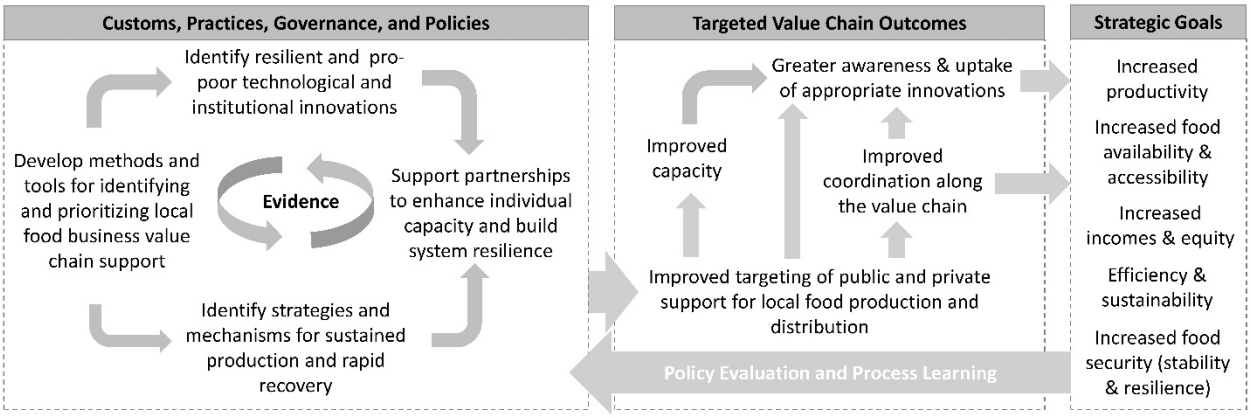
A substantial body of public policy research suggests that policy change is most likely to occur when political entities want, and believe they can deliver, solutions to issues they perceive as problematic (Jones et al., 2016). To understand how to make change within that paradigm, advocates must be able to both draw attention to problems, articulate their goals, and suggest possible solutions. The tools described in Chapter 2 of this toolkit can help communities understand collective problems and create plans for addressing them:

- Asset mapping: What assets exist in the community that we can leverage to solve an identified problem?

- Focus groups: What are the problems our community faces? What experiences, shared or unique, have participants had regarding community resilience or the lack thereof? What ideas do they have for improving resilience?
- Nominal groups: Out of several possible solutions, which do we want to prioritize? Can we decide how we want to move forward?
- Strategic planning: How are we going to accomplish our goals? What structure will we build to bring those goals to fruition?

We find the conceptual model illustrated in Figure 6 useful for understanding how the work accomplished in Chapter 2 feeds into the larger policy picture of improving food system resilience. This model is adapted from the Consultative Group on International Agricultural Research (CGIAR) Livestock and Fish Theory of Change (Baker et al., 2013). It frames interventions in food systems in terms of the customs, practices, governance institutions, and policies shaping food production outcomes. In addition, the model emphasizes the roles of partnerships (e.g., among producer associations or cooperatives) and improved coordination along the food value chain (including processors, distributors, marketers, and ultimately food preparers and consumers) as key leverage points for realizing strategic goals. These goals relate both to productivity and incomes for producers and to availability and access to food for consumers, as well as broader environmental and societal benefits such as energy efficiency, natural resource sustainability, and increased food security including long-term food system stability and resilience.

Figure 6



Note. Adapted from the Consultative Group on International Agricultural Research (CGIAR) Livestock and Fish Theory of Change, a value-chain approach to the study of food production and distribution.

Translating Goals into Action: The Multiple Streams Approach

The tools in this toolkit can help communities identify vulnerabilities and opportunities for building resilience. The work can start here, and in many cases grassroots efforts can make an immense progress in building resilience. But building systemwide structural resilience requires moving up the ladder to integrate goals into public policy.

The Multiple Streams Approach is a useful framework for understanding the process of political decision making in the United States (Figure 7). First conceived by John Kingdon (1984) and later refined by Nikolaos Zahariadas (2007, 2014), the Multiple Streams Approach is widely applied in the systematic study of the factors and processes that influence policy making (Jones et al., 2016). The approach divides the U.S. political process into three streams: the problem stream, the policy stream, and the politics stream. These three streams operate separately most of the time but must be joined for policy action to take place.

The **problem stream** identifies problems requiring government attention (Zahariadis, 2007). Policymakers become aware of problems through a variety of ways. The central problem-identifier relevant to our work is the advent of a **focusing event** like a natural disaster—a big,

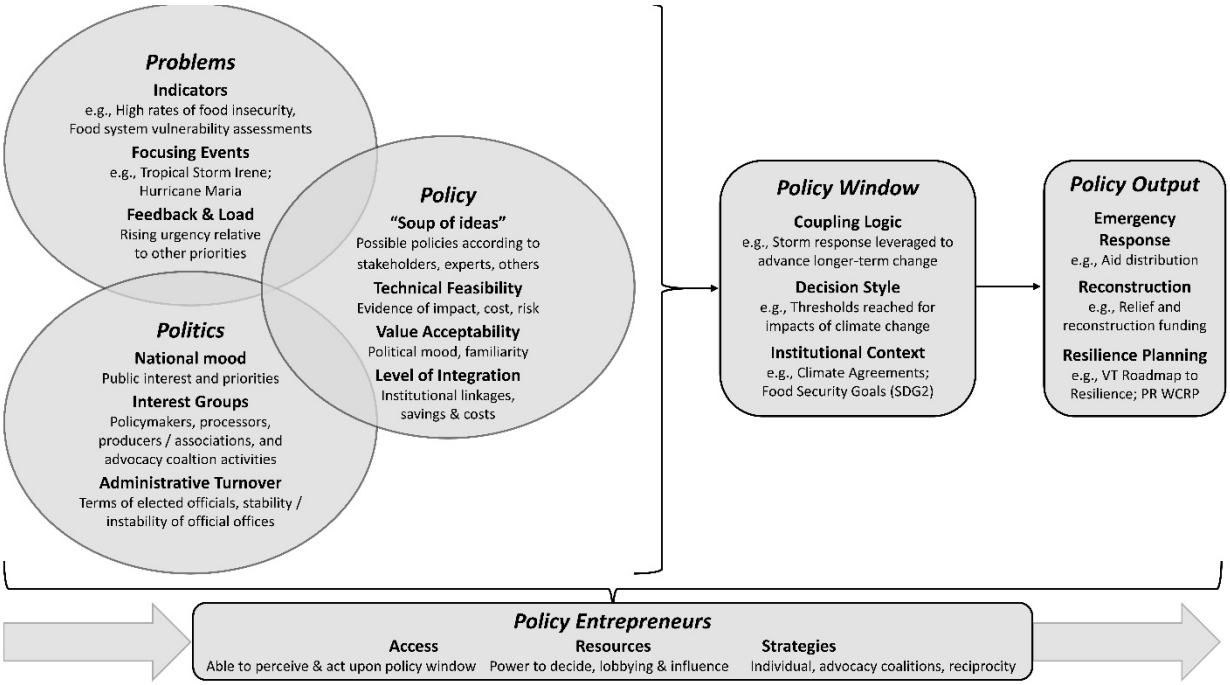
dramatic problem that draws (and requires) political attention. But problems can also be identified through more routine processes: anticipated focusing events like the renewal of regular legislation (such as the Farm Bill); **indicators** that bring the problem to attention (i.e., a research study finds an increase in food insecurity, or an agency budget balloons); **feedback** from past policy successes or failures; and the total **load** of problems that policy makers need to attend to (Zahariadis, 2007, 2014).

In the **policy stream**, specialists working both in and outside the government develop **alternatives** (i.e., solutions or policy ideas). These specialists (government agency employees as well as researchers and practitioners in a specific field) test and refine these alternatives on a smaller scale and familiarize the public with their ideas. Importantly, these alternatives are developed apart from the problem stream; they need to fit multiple possible problems to maximize the possibility of broader policy adoption. When the streams do join and policy makers look for solutions to the problem at hand, they are guided by multiple considerations, including: (i) technical feasibility of the policy (including potential for success within existing resource constraints); (ii) value acceptability (consistency with a policymaker's political platform); and (iii) the level of integration (if a solution seems challenging to implement or too costly it has a lesser chance of approval) (Zahariadis, 2007, 2014).

The **politics stream** refers to the broader political context, and includes considerations such as national mood, interest group activities, and institutional considerations such as administrative or legislative turnover (Zahariadis, 2007). The overlapping or conflicting goals of different stakeholder groups, the stability or volatility in membership and authority of competing

parties in power, and the influence some groups have over policymakers all impact the agenda setting process (Zahariadis, 2007, 2014).

Figure 7



Passing policy is possible during **policy windows**: moments in time where it is possible to accomplish a given goal. Windows can open at the start of a new administration, when it is time to renew regular legislation, or when a big focusing event brings urgency to the subject. Kingdon (1984) coins the term **policy entrepreneurs** to describe the people who invest their resources in advancing a certain policy idea. He describes them as surfers waiting to catch a wave—the wave being the opening of a policy window. When the window opens, policy entrepreneurs make political change happen by **joining streams**: they attach existing policy solutions to whatever problem politicians are focused on to take advantage of the political moment.

Shocks, be they natural disasters, pandemics, or socio-political crises, are strong **focusing events** under the Multiple Streams Approach. The need to respond to the immediate disaster

often opens a **policy window**, and **policy entrepreneurs** with experience and passion in food systems, community development, or other relevant fields may have the opportunity to advance alternatives while politicians are focused on vulnerabilities revealed by the shock. But whether politicians respond to a disaster by investing in long-term resilience building or by merely bandaging over the immediate symptoms of crisis depends on the political context, the moment when crisis hits, and a variety of messy human factors. In the remainder of this chapter, we will compare the distinct experiences of Vermont and Puerto Rico in their responses to major storm events.

Extreme Weather as a "Focusing Event": Agreeing on the Problem

In late August of 2011, Hurricane Irene traveled through the Caribbean and up the East Coast, downgrading to a Tropical Storm when it hit Vermont. Now slowed, it sat over the state dumping 11 inches of rain over 12 hours, flooding almost every Vermont waterway and causing immense damage to the state's bridges, roads, farmland, and buildings (O'Connor, 2021). Tropical Storm Irene impacted 225 out of Vermont's 246 municipalities, contributed to six deaths, and led 7,252 households to apply for federal disaster assistance (State of Vermont, 2012).

After Irene, the state of Vermont made several attempts to foster resilience through policy. The biggest of these efforts was the "Roadmap to Resilience," which offered recommendations in four broad categories: (1) Know relevant risks, (2) Elevate emergency management in policy priorities, (3) Align rules and investments, and (4) Work together (Institute for Sustainable Communities, 2013). The State Hazard Mitigation Plan Steering Committee then

created a plan documenting and spreading awareness of known hazards faced by Vermont (State of Vermont, 2018).

Vermont's Roadmap to Resilience emphasized that "the work to plan, prepare for, respond to and recover from disasters should receive attention at all times, not only in the aftermath of a disaster, and shouldn't be isolated within one department, division or local organization" (Institute for Sustainable Communities, 2013, p. 4). The report likewise noted that building resilience in Vermont would require direct investments, policy changes, network building, and expanded programming and engagement. The Roadmap to Resilience is one example of how Vermont was able to use the momentum of disaster response to Tropical Storm Irene to create meaningful policy reforms. Tropical Storm Irene was a focusing event that galvanized policymakers to make long-term resource commitments and structural reforms with the goal of lasting resilience. And the knowledge learned through the experience of disaster response and policy creation has itself improved Vermont's resilience. In a case study of Vermont Everyone Eats, a FEMA-funded emergency feeding program during the Covid-19 pandemic, Massie and Heiss (2022) found that task force members drew from their experience during Irene to create, fund, and mobilize the program in a short period of time.

Puerto Rico's experience with post-disaster policy reform has been distinct from Vermont's. Being a far more dire disaster resulting in the loss of thousands of lives, Hurricane María might have been a major focusing event for developing and enacting policy reforms in support of system resilience, especially improvements to built capital. Hurricane María destroyed homes, farms, fishery fleets, and processing and transport infrastructure and resulted in a power blackout that lasted 329 days and accumulated an estimate of Customer Hours of Lost Electricity Service (CHoLES) of more than 2.9 billion (Castro-Sitiriche et al., 2018). The "María Blackout"

was the longest power outage in the history of Puerto Rico and one of the largest blackouts ever recorded, second only to the Hayan and Bopha typhoons (Marsters & Houser, 2017). Two months after María, 20 out of 78 municipalities had absolutely no power from Puerto Rico Electric Power Authority (PREPA) and less than a million customers had electricity (Castro-Sitiriche et al., 2018). Five months after María, nearly two hundred thousand households still did not have electric power, representing 13.4% of the total number of PREPA clients (PREPA, 2018). Nine months after Hurricane María, fifteen thousand households still did not have power.

Hurricane María did lead to several official policy actions aimed toward resilience. Federal and Territory agencies collected data about vulnerability to future crises and invested in resilience planning efforts. One of the largest of these was the $37.5 million Whole Community Resilience Planning (WCRP) Program, supported by the Puerto Rico Department of Housing (PRDOH) with financing from the United States Department of Housing and Urban Development (HUD). The WCRP's mandate cover a broad array of planning goals relating to housing, health and environment, education, infrastructure and economic development; the program has also invested in public datasets such as the WCRP Interactive Vulnerability and Risk Maps (a publicly accessible geospatial data resource).

Yet many investigations into the response to Hurricane María found fault with the political response to the crisis. A study of farmer adaptations by Rodríguez-Cruz et al. (2021) highlighted many policy-related obstacles farmers and other food producers encountered when attempting to access relief support, services, and supplies from governmental agencies. The stakeholders Borges-Méndez and Caron (2019) interviewed in the coffee-growing region of Puerto Rico reported extremely slow emergency responses from government agencies and insufficient knowledge resources and extension support. And in the focus groups we conducted

for this toolkit in 2020 (summarized in Chapter 4), participants complained that two and half years after the hurricane, the power grid remained unstable and Puerto Rico continued to experience regular blackouts.

In 2022, as we prepare to publish this toolkit, Puerto Rico's electrical grid remains fragile. Puerto Rico privatized electrical service in 2021 and contracted with LUMA Energy. Since then, electricity in the archipelago has dramatically increased in price, and blackouts continue (Ayala, 2022). In September 2022, Hurricane Fiona, a category 1 storm, plunged the whole island into darkness within hours (Ayala, 2022). Because of a variety of factors, concentrated in the politics stream, the focusing event of Hurricane María did not lead to significant resilience-building policy reform.

Yet even when effective policy-level reform is not possible, community members can still take action to improve resilience. Borges-Méndez and Caron (2019) argue that true resilience is not possible in Puerto Rico while it remains a territory, but that supporting local and regional efforts can still improve wellbeing in the archipelago. Several grassroots efforts have emphasized local foods and investment in farmer-processor-consumer networks as a means of restoring and expanding economic opportunities for farmers, fishers, aquaculture producers, and other food value chain actors (Case, 2019), and also as a means of preventing food insecurity following future disruptive events (Robles, 2018; Watson, 2018). This approach is supported by the focus groups we conducted (detailed in the following chapter), in which participants felt that grassroots and nonprofit efforts at disaster relief were in many cases more effective than the government.

The diverse experiences of Vermont and Puerto Rico in policy responses to a storm event may be attributable to a wide variety of factors: storm severity, magnitude of destruction and loss of life, fragility of built capital going into the crisis, frequency of natural disasters, poverty levels

and access to financial capital, sovereignty and federal representation, political leadership at the time of crisis, and others. The two regions and situations are so different that it is impossible to draw clear comparison between the two, but it is evident that the policy window for long-term resilience building did not open in Puerto Rico to the same degree as it did in Vermont. In the following chapter, we will discuss the research we conducted in both regions and explore its implications for building food system resilience in different geographic, climatological, and socio-political situations.

IV. Lessons from Puerto Rico and Vermont

In the final chapter, we present the results of research conducted by the University of Vermont and University of Puerto Rico at Mayagüez. Each team conducted a series of interviews (both focus groups and individual interviews) over a span of six months. The study period fell during an unfortunately appropriate time for this research. UPRM set out to analyze the response to Hurricane María, and then the Covid-19 pandemic set in in the midst of the research planning process. UPRM pivoted their focus groups online, and the remote discussions looked back on the experience with Hurricane María and touched on the present crisis of the pandemic. UVM convened focus groups in the fall of 2019 to discuss how participants would plan for a hypothetical crisis. Six months later, in March 2020, that hypothesis became reality. The UVM team conducted a follow-up expert panel in the fall of 2021 and compared panelists' experiences during the Covid-19 pandemic to the plans proposed by 2019 focus group participants. The UVM team also looked back on years of work with long-term research collaborators Food Connects and the University of Vermont Medical Center to create two case studies of how one small and one large organization adapted to the Covid-19 pandemic.

This chapter will summarize the findings from each team, identify unifying themes between regions, and explore possible implications for food system resilience.

Hurricane response in Puerto Rico

The UPRM team held three focus groups with representatives from organizations that provided essential food aid and services to the communities in the west and central-west regions of Puerto Rico in the aftermath of Hurricane Maria. Participants came from a diverse array of sectors, including health care, fisheries, small farms, and agricultural extension. Each focus

group had 8-9 participants, and discussions were conducted over Google Meet. The UPRM team asked focus group participants to draw from their experience with Hurricane María to address what knowledge, infrastructure, policy, and other resources help disaster response, as well as what challenges impede it.

The UPRM team transcribed and analyzed the focus group interviews and identified five central themes. These results are summarized below.

Infrastructure

All participants were severely affected by the failure of vital **infrastructure** that they had believed to be in better condition, especially electric, telecommunications, and road infrastructure. Across industries, centralization and consolidation compounded the effects of these infrastructure failures. Power generation and distribution in Puerto Rico was controlled by the Power Authority, and failure of just one power plant could darken multiple towns. All milk pasteurization in Puerto Rico was handled by two processing plants near San Juan, and when the roads between dairy farms and these processors became impassable, raw milk was dumped en masse, despite a population in need. Nearly three years after María, participants bemoaned the continued fragility of Puerto Rico's infrastructure. As one participant said:

> The simple fact is that Puerto Rico's electrical system is so fragile that it rains and the power goes out. We saw it at the press conference [of the Governor of Puerto Rico], talking about how prepared they were [for the new hurricane season], and the power went out [right in the middle of the conference].

Participants recommended multiple strategies for increasing the resilience of infrastructure to disasters, including installing solar panels for electricity generation, constructing storage facilities, and expanding radio communication capacity.

Ineffective and obstructionist policy

Participants felt that the **policy environment** was ineffective and even obstructionist at lessening the impact of disaster or aiding recovery. They specifically called out the Cabotage Law, established by the Merchant Marine Act of 1920 (also called the Jones Act). This law mandates that only U.S. ships may transport goods from one U.S. port to another, which increases the cost and complicates the process of receiving provisions and supplies in Puerto Rico (and elsewhere). As one participant said, in the aftermath of Hurricane María, "we lost everything, we had nothing!" and the Cabotage Law inhibited the transport of aid from abroad. As for the policies directly related to disaster, participants felt there were too many disaster management plans, and that in the end none of them were followed. A participant remarked "part of the debacle we lived through was because the governor at the time imposed a system different to the one we were supposed to follow. We lived months and months completely disoriented!" Moving forward, focus group participants recommended promoting laws or regulations that would require government agencies to work closely with community leaders during and after disasters.

NGOs and community organizations

Many participants felt that **NGOs and community organizations** were more efficient and addressed community needs more directly than the government. Participants believed that

small community initiatives provided opportunities for self-management, increased interest and motivation for participation, and created a sense of accomplishment. They were also more effective: as one participant said, "community support…proved to be…the fastest way to find solutions and [provide] relief to the areas in need." They named multiple grassroots initiatives that arose to solve problems that the government had left untouched. Participants also noted how important the knowledge of community leaders was for meeting basic needs after the hurricane. Community leaders who had inventories of supplies, seeds, and human resources, as well as technical skills to help their communities seek aid, were indispensable in the aftermath of recent crises.

Need for food systems planning

Participants felt there was an acute and widespread need for better **food and agricultural planning** in Puerto Rico. Multiple participants called for food and agriculture education for children and adults to promote home gardens, develop an agricultural workforce, and increase the societal value of food and agriculture. Participants also lauded Puerto Rico's small agroecological farms for planting a diverse range of crops, many of which were hurricane-resistant and provided ready food in the aftermath of María. And the short distribution chains used by many small farms were more resilient to the present disaster of the COVID-19 pandemic; as one participants said:

> Farmers with a short distribution chain have been able to cope and their sales have even skyrocketed [during the pandemic] and are at their highest! While conventional, traditional farmers had to shut down their operations, since they were not able to withstand the economic impact!

Yet while small agroecological farms and short distribution chains had helped Puerto Rico weather multiple crises, focus group participants named many obstacles faced by these producers. Participants called for making local food more accessible to the populace by increasing diversity and knowledge of food markets and making it possible to use EBT at farmers and fish markets. They also called for the USDA to adjust their definition of "small farms" as most Puerto Rican agroecological farms were too small to be eligible for small farm aid.

Importance of women's leadership

In analyzing the focus group transcripts, the UPRM team observed that the **importance of women's leadership** in recovery efforts was threaded throughout the conversations. Women were at the forefront of many recovery initiatives, including leading fisheries councils and producer organizations, crisis management, teaching survival skills, and promoting alternative energy. The study celebrates progress to date in promoting **gender equality** and calls for continued efforts to build equal opportunity for women in all sectors.

Pre-COVID Resilience Assessment in New England

In the fall of 2019, the UVM team conducted four focus groups: three with professionals from institutional food service (K-12, hospital, and higher education) and one with technical assistance providers. Questions focused on necessary resources, barriers, and advice for those wishing to start a Farm to Institution program as well as institutional strategies for feeding people in the event of a long-term emergency lasting weeks or months.

What we did not know in the fall of 2019 was that we were on the precipice of an emergency that would last years. In the fall of 2021, two years after the first focus groups and a year and a half into the COVID-19 pandemic, the UVM team convened an expert panel of two institutional foodservice administrators and three technical assistance providers to set the stage for a new farm-to-institution research project. Three of the panelists had also participated in the 2019 focus groups. The UVM team asked the panel about the problems farm-to-institution solves, what benefits it yields, and what research would be helpful to their work.

When the UVM team reviewed the 2019 focus group discussions in light of 2021's panel discussion, they found that many hypothesized tools for resilience in 2019 turned out to have been useful during the COVID-19 pandemic. Below we have outlined the key themes from the 2019 focus group discussions with added insights from the 2021 expert panel.

The strongest theme of the 2019 focus groups was the importance of **relationships and partnerships**, especially between institutional foodservice and their supply chain partners. Sourcing locally grown foods even in the best of time involved complex logistical coordination. The importance of relationships was also one of the major themes in the 2021 expert panel. Looking back at their experiences during the COVID-19 pandemic, our panelists found that "where there are strong existing relationships between people within the facilities and their vendors…those tended to be more likely to be maintained and sustained." The foodservice administrators on the panel reported that, while they experienced product shortages from broadline distributors, what they procured locally remained consistent.

The technical assistance providers in the 2019 focus groups advocated for **asset mapping** as a strategy for those beginning farm to institution work. Asset mapping can reveal potential

stakeholders, partnerships, and opportunities. Participants also recommended that institutions conduct an internal audit of what foods are already on the menu that can be sourced locally.

2019 focus group participants also noted that developing and utilizing **metrics** were valuable to program success across the board. Good metrics help with storytelling and promotion, planning ahead with vendors and farmers, and signal commitments to both internal and external stakeholders.

Yet participants in both the 2019 focus groups and 2021 panel noted that **human resources** were a major challenge in farm-to-institution organizing. As a 2021 panelist remarked, "What comes before those existing relationships is like people with the bandwidth to build relationships." Building partnerships with multiple suppliers, helping small and midsized producers navigate wholesale supply and delivery challenges, and collecting metrics requires a foodservice administrator with significant time to dedicate to local procurement. Increasing local food procurement also can exacerbate already acute **skilled food preparation labor shortages** in institutions. New England is home to multiple local food aggregators and processing initiatives, which can help institutions increase local food purchases in the face of these labor challenges.

Case Studies: Two Vermont Food Operations During the COVID-19 Pandemic

Below we summarize case studies of two Vermont food operations highly impacted by the onset of the COVID-19 pandemic and associated lockdowns: the University of Vermont Medical Center Dining Services and the Food Connects Food Hub. Both operations exhibited resilience thanks to a combination of organizational strengths going into the pandemic and their ability and willingness to pivot and adjust during this period of change.

University of Vermont Medical Center Dining Services

The University of Vermont Medical Center (UVMMC) is Vermont's largest hospital. It was one of the first hospitals in the country to sign Health Care Without Harm's Healthy Food in Health Care Pledge and codify its commitment to serve local, nutritious, and sustainable food. A 2016 study showed that UVMMC spends $1.7 million each year on local food, generating an additional 78 cents for every dollar spent locally (Becot et al., 2016). And UVMMC does more than just buy local: they work closely with local producers to help them navigate order volume, transportation and delivery, food safety requirements, and other logistics. The hospital's dining services offer a vital on-ramp for small farmers looking to sell wholesale, essential nutrition for hospital patients, and an affordable option for employees and community members to get a healthy and appetizing meal.

As a hospital, UVMMC was highly impacted by the onset of the COVID-19 pandemic, and so were its dining services. With all non-urgent procedures cancelled and doors shuttered to visitors, the hospital was down to 450 meals a day from the usual 950. UVMMC stretched their payroll budget to retain employees: director-level executives and higher took pay cuts, staff hours were cut, a voluntary furlough was offered, and low-wage staff received a $12,000 bonus at the start of the pandemic. UVMMC held daily meetings with foodservice staff at the start of the pandemic to keep employees apprised of changes and reached out to industry contacts for ideas and training as the hospital adapted to a socially-distant mode of service.

Despite lower food volumes, UVMMC was still challenged by supply chain shortages in the spring of 2020. Their broadline distributor had difficulty adjusting to new order schedule and volumes, and the hospital struggled to place periodic orders of necessities. UVMMC navigated

these challenges by using inventory in storage and by adjusting their menu according to product availability. They also helped staff through product shortages by creating a pop-up grocery store offering hard-to-find items like toilet paper and chicken. Even so, local suppliers reported negative impacts of the sharp decrease in UVMMC order volume. Orders did pick back up when non-essential procedures resumed, and staff likewise returned to full capacity by the fall of 2020.

Food Connects Food Hub

Food Connects is a nonprofit organization based in Brattleboro, Vermont. Founded in 2013, their mission is to deliver local food, as well as education and consulting services, with the aim of transforming the local food system. One of their cornerstone programs is a Food Hub that aggregates products from small and medium sized local farms to offer them for wholesale. Food Hub sales doubled in 2020, growing from around $500,000 in 2019 to over 1 million in annual sales in 2020. Although the Food Hub was already experiencing rapid growth prior to the Covid-19 pandemic, sales tripled in the spring of 2020 as the Food Hub responded to a sharp increase in demand for local food.

Like many small nonprofits, Food Connects had a lean staff with no overlap between job duties. This lack of personnel redundancy made it hard to adjust to increased demand and changes in delivery protocols. In other ways, however, its staff was an advantage: management practices encouraging delegation and independence allowed staff to make time-sensitive decisions, increasing adaptability. Eventually Food Connects was able to hire 8 new staff members (4 full-time, 4 part-time) and to prioritize cross-training among staff to build redundancy between positions.

Food Connects was highly adaptable in the variable local food environment of spring 2020. Thanks to longstanding ties with both farmers and buyers, its Food Hub became the go-to source for local food in the community. Though some buyers like schools and restaurants completely shut down, other markets increased thanks to supply shortages and increased interest in local foods. Food Connects also added new customers: many of their farm suppliers started purchasing foods from other farms to sell at their farmstands, and Food Connects also started selling direct to consumers through a curbside pickup program. Food Connects rented additional office space, built a new cooler, and purchased a fourth refrigerated vehicle, and was able to double their inventory to meet increased demand. Several of these projects had already been planned in advance of the pandemic, and the team was able to implement these changes in 3-5 months instead of years.

Lessons for Resilience

Our research in New England and Puerto Rico both drew from and informed the frameworks we set forth in the introduction. In analyzing the focus groups and interviews in both regions, we found many connections to indicators of food system resilience named in the literature and Flora et al.'s (2004) Community Capitals framework.

Diversity and *redundancy* were named as both advantages and challenges across all our research efforts. Focus group participants in Puerto Rico condemned the archipelago's highly centralized utility and processing infrastructure. Lack of diversity in **built capital** created food waste in times of food shortage and led to electric system fragility and failure. On the other hand, participants celebrated Puerto Rico's agroecological farms, which though small in size and number, offered uninterrupted food access during both Hurricane María and the Covid-19

pandemic. Because these farms planted a diverse array of crops, including hurricane-resistant crops compatible with the island's **natural capital**, they did not lose plantings during María as conventional farms did.

Members of our post-Covid New England Farm to Institution expert panel were grateful for diverse institutional supply chains; while broadline distributors had item shortages, deliveries through local shorter supply chains remained consistent. In our case studies, both Food Connects and UVMMC relied on **built capital** that created redundancy during the pandemic: UVMMC turned to offsite storage of emergency items and dry goods to make up supply shortages, and Food Connects expanded its storage capacity in response to increased demand. But Food Connects also named their lack of redundancy in **human capital** as a major challenge: having no overlap between job responsibilities inhibited their ability to respond nimbly at the onset of Covid-19. The organization has learned from this experience and has made cross-training a priority.

As noted above, research participants in both Puerto Rico and New England found *local and independent supply chains* to be more resilient during both natural disasters and the Covid-19 pandemic. As one Puerto Rican focus group participant said, "Farmers with a short distribution chain have been able to cope and their sales have even skyrocketed [during the pandemic] and are at their highest!" This is paralleled by the experience of Food Connects, which doubled food hub annual sales between 2019 and 2020.

The resilience of local food supply chains in Puerto Rico stands in stark relief to the failure of its longer supply chains. Destroyed roads post-María inhibited deliveries to the island's centralized milk processing facilities, and international deliveries and aid were hampered by the Cabotage Law, which held fast in spite of the emergency situation. The Jones Act problem is just

one example of how Puerto Rico's resilience is inhibited by lack of **political capital** due to its territorial status and long history of colonization. Political issues affect Puerto Rico's short supply chains as well: most of its farms are too small to qualify for small farm aid, and customers cannot use EBT at farmers markets, despite this being a widespread practice in the continental United States.

Local and short food supply chains have strong **political capital** in New England, where all six states in the region have passed laws incentivizing or mandating local food procurement at public institutions (Farm to Institution New England, n.d.). Even so, New England focus group participants and panelists noted that local procurement was limited by insufficient **human capital** in both administration and food preparation. Participants called for increase funding for procurement coordinators with the time to dedicate to building **social capital** with local supply chains. They also noted that preparing unprocessed local produce was a major challenge during skilled foodservice labor shortages.

Strong relationships built resilience in both Puerto Rico and New England. As touched on above, New England research participants before and since the pandemic emphasized the importance of relationships and **social capital** between buyers and suppliers for local food system resilience. UVMMC relied on relationships and **social capital** with other health care institutions to design safety protocols and staff trainings at the onset of the COVID-19 pandemic. UVMMC also prioritized relationships and trust with their foodservice staff. They stretched their **financial capital** to retain employees and even provide bonuses to low-wage workers. The efforts they made to retain **human capital** allowed them to return to full capacity with relative ease when non-essential procedures resumed, and as a major employer they also contributed to full-system resilience by avoiding layoffs during a financial crisis.

Focus group participants in Puerto Rico celebrated community leaders, who by virtue of established relationships and **social capital** in their communities led far more effective disaster relief efforts after Hurricane María than the government. The proliferation of women in these leadership roles demonstrates how strides made toward *social equality* have contributed to resilience as well.

Creativity and adaptability were essential across all regions, disasters, and actors in our research. In Vermont, Food Connects was able to accelerate expansions of both **built** and **human capitals** thanks to a combination of existing plans, increased **financial capital** from business growth, and a nimble staff. Management practices encouraging delegation and independence enabled creativity across their full pandemic response. UVMMC also had to adapt creatively during the pandemic, changing menus with available supply, adjusting foodservice protocol, and holding daily meetings to facilitate communication with staff. In Puerto Rico, grassroots and nonprofit efforts exercised creativity to fill voids left by the government's disorganized response to Hurricane María. When official systems failed, the **cultural capital** of community efforts and grassroots organization allowed Puerto Ricans to fight for their own recovery from acute disaster.

V. Conclusion

This toolkit offers frameworks for defining and organizing community and food system resilience, tools for assessing and improving resilience, and lessons from our own work in two very different regions of the United States. We hope that by mapping your community's assets and holding focus and nominal groups you are able to create and mobilize a strategic plan for building your community's resilience. By becoming a policy entrepreneur for resilience-building efforts, you may be able to advance your plan into policy at the opening of a window. But, as the case of Puerto Rico shows, sometimes even a dramatic focusing event does not open the window for policy change. In these situations, activating your strategic plan through community work can still improve quality of life and contribute to resilience. And grassroots projects can also expand the network of policy entrepreneurs refining resilience-building strategies and waiting to surf the wave to full-system resilience when the moment strikes.

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