

The Landscape of Public Thinking about Farming

Mapping the Gaps between Expert and Public Understandings

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A **FrameWorks** Research Report

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Introduction

Farming has profound effects on our health, our economy, and our environment, yet most Americans' experience with and knowledge of farming is limited. The mythical image of the yeoman farmer, which grew out of our agrarian past, lies at the heart of conceptions of the nation in its early days.¹ This prototypical American owned and worked his own land, embodying the ideals of industry and independence that were central to the young republic. Today, however, fewer than 2 percent of the population is directly involved in agriculture, and the public's understanding of farming no longer grows out of direct or personal experience.² As a result, Americans have a much weaker grasp of what farming involves and what practices and policies are needed to ensure that the system provides healthy, safe, and affordable food while, at the same time, maintaining and enhancing the wellbeing of the environment and the farming community.

The need to enhance public understanding of farming is clear and urgent. Farming stands at the heart of a food system that has the potential to increase access to safe, healthy, and affordable food. Moreover, farming can either enhance or degrade our environment. The right farming practices can mitigate the effects of climate change, but only if they are consistently adopted. The good news is that the public appears ready and eager for more discussion and action around farming and food production. Recent surveys show strong public support, admiration, and concern for the wellbeing of farmers; increasing familiarity with and interest in eating healthy, local, and organic foods; and growing curiosity and concern about where food comes from and what happens before it lands on grocery store shelves and restaurant tables.³

To build understanding and strengthen support of sustainable farming practices in the United States, the FrameWorks Institute is researching how the American public thinks about farming and developing strategies to deepen their understanding of it. This report presents findings from the first phase of this project. The research was conducted in partnership with the Farming and Food Narrative Project, a team of agricultural scientists, farmers, and champions of good farming and food that is supported by a coalition of funders dedicated to sustainable farming.⁴ To allow for a manageable scope, this project focuses on plant farming. Animal agriculture also poses critical challenges for our society and the world, but it involves a distinct set of issues that this research does not consider.

This report identifies the cultural models⁵—the common but often implicit patterns of thinking and assumptions—that underlie how the American public understands and reasons about farming and good farming practices. In contrast to public opinion research, which tells us *what* people think, cultural models research tells us *how* people think, delving below explicit beliefs and attitudes to the taken-for-granted assumptions that form the bedrock of American culture and structure our thinking and discourse. Understanding the cultural models that are available to members of the public enables us to

identify challenges in public thinking that face advocates of sustainable farming and to develop strategies that they can use to overcome these challenges.

First, we present the “untranslated expert story” of farming, which emerged from interviews conducted with farmers, academic researchers, policy experts, and agricultural extension specialists who educate farmers and help them adopt new practices. This story distills the knowledge of farming experts into a set of core points that advocates want the public to understand; these points address what farming is, why it matters, how it works, and how our society can better support farmers and effective farming practices.

We then present the findings of cultural models research, which identifies the different ways that Americans think about farming. Some of these ways of thinking are productive and can be used to communicate key ideas, while others are unproductive and obscure important aspects of farming and best practices. In short, we find that Americans value farming and appreciate it as challenging work; at the same time, they understand farming as relatively simple work and do not fully appreciate the complexity involved in farming or farmers’ expertise in managing this complexity. The public also has a limited understanding of farming practices, with little to say about soil management and a narrow view of pest management. In particular, people equate pest management with the application of chemical pesticides and, because they see chemicals as bad and unhealthy, assume that pesticides should largely be avoided. And while people recognize that farming affects consumer health, they think much less about farmers’ and farmworkers’ health or the environmental and economic effects of farming.

Next, we “map the gaps” between the perspectives of experts and the public, examining points where understandings converge and diverge. This analysis highlights the key challenges advocates face when communicating about farming and how to improve it in the United States. We conclude with a set of preliminary framing recommendations that the field can use to begin to increase public understanding of farming and a “to do list” for future communications research.

The Untranslated Expert Story of Farming

This section presents the themes that emerged from 12 one-hour phone interviews with leading experts in the field of farming in the United States, including farmers, academic researchers, policy experts, and agricultural extension specialists who educate farmers and help them adopt new practices. Interviews focused on crop farming—the commercial production of plants. Issues related to animal agriculture were excluded in the interest of keeping the scope of inquiry to a manageable set of topics.

Interviews were organized around five key questions. Experts' responses represent the “untranslated expert story” of farming: the core principles that experts want to communicate to the public.

1. What is farming?
2. Why is farming important?
3. What are the challenges involved in farming?
4. How can farmers effectively meet the challenges of farming?
5. What should society do to help meet the challenges of farming?

What Is Farming?

- **Farming is a primary source of food for humans.** Crop farming is the commercial production of plants for a variety of uses, including food, animal feed, textiles and clothing, landscaping and aesthetic purposes (e.g., grass, flowers, etc.), and fuel. Although growing crops has many purposes, experts emphasized the centrality of human food provision. Fruits, vegetables, nuts, and grains are grown and then sold for direct consumption (food) or indirect consumption (ingredients in processed foods). Farming includes the steps that occur before crops are purchased for direct or indirect consumption; it encompasses growing, handling, storing, packaging, selling, and marketing crops in their whole form.
- **Farming is a business.** Economics is essential to farming. Crops are grown to be sold and provide a livelihood for farmers, regardless of type or method of production. Thus, farming must be cost-effective and must distribute and market crops that are acceptable and affordable to consumers across a broad range of incomes. This requires economic resources and savvy as well as management skills.
- **Farming is diverse in both scale and practice.** US farms vary greatly in size, from small plots to thousands of acres of land. Although some farmland is owned and run by large companies, the majority is owned and managed by families. Of the 2.1 million farms in the United States in 2012, 88 percent were small farms and 97 percent were family-owned.⁶ Farming relies on human and machine labor and on various biological, chemical, mechanical, and cultural methods. Farmers

determine labor type and methodology depending on the biology of their crops, their philosophy of food production, and their practical needs.

- **Farming involves complex decision-making and risk management.** Farmers must consistently make difficult choices around growing, handling, storing, packing, selling, and marketing crops. To do so, they must balance many different and often contradictory factors, such as crop biology, local climatic and weather conditions, the kinds and abundance of pests, the availability of water and nutrients, regional and international labor and market conditions, contractual obligations with processors and distributors (which often require adherence to specified management practices), and government policy and regulations. Because most of these factors are in constant flux, farmers must often make decisions about growing crops well before they know their market value. Thus, farming necessarily involves a great deal of economic uncertainty and risk.
- **Farmers are applied scientists, mechanics, and managers who have a diverse and unique set of skills and knowledge.** Farming demands a great deal of specialized expertise and commitment. To succeed over the long term, farmers must understand technology, biology, chemistry, ecology, economics, and business management, among other fields of expertise, and they must be able to apply this knowledge to an unstable environment.

Why Is Farming Important?

- **Farming is an integral part of human culture.** Until recently, most humans practiced or directly engaged with farming. Farming has shaped people's lifestyles and values for centuries and formed the foundation of culture. Though people are increasingly disconnected from crop farming, it nonetheless remains an important cultural and educational resource for the public. Agro-tourism (e.g., pick-your-own fruit and vegetables), school gardens, and farm-to-table restaurants tie farmers to communities, and heroic portrayals of farmers in movies, children's literature, and advertising emphasize the cultural value of food production and preparation.
- **Farming is an important part of the economy that affects the livelihoods of many people.** Farming is a direct source of employment and economic security for many people in the United States and a primary source of food, textiles, landscaping, and fuel. Although fewer than 2 percent of the US populace is directly involved in farming, it contributes to the employment and economic wellbeing of millions of people who work on farms and in other related and dependent industries, such as food processing and transportation. Farmers' economic success also affects their communities' economic wellbeing, especially where farming is a major industry. Crops represent a large portion of products traded in the national and international economy, and governments at the federal, state, and local levels invest in and support crop farming research and extension programs and subsidize the production of certain kinds of crops. In short, all US taxpayers have an economic stake in crop farming.

- **Human survival and health depend on farming.** Crops are, of course, a primary source of food for humans, so their production enables human existence. The types of crops farmers grow and how they grow them significantly affect public health. Practices that remove harmful pathogens and diseases from crops enhance their nutritional value and safety and reduce illness and disease. Crop farming directly affects the health of farmers and farmworkers and indirectly affects public health through its effects on soil, water, and air. Practices that promote healthy soil prevent erosion and runoff, which, in turn, mitigate the movement of toxic materials into streams, lakes, and, ultimately, our drinking water.
- **Farming affects the health and quality of our natural environment.** Using land to produce crops benefits the environment because it maintains green space and provides a habitat for wildlife that is not possible with most other types of land use. However, farming requires the alteration and extraction of resources from the land to allow it to produce something it otherwise would not. Some natural resources are difficult, if not impossible, to restore.
- **Farming practices can either enhance or degrade the health of soil, water, and air.** Mismanagement of pesticides and fertilizers, including drift from one farm to a neighboring one, can pollute water bodies and the atmosphere. In some instances, the effects are felt far from the source of pollution. In contrast, scientifically informed use of pesticides, fertilizers, and machinery can prevent soil erosion, diversify local ecosystems, and reduce the emission of gases that contribute to climate change. Practices that enhance soil health, meanwhile, prevent potential pesticides, fertilizers, and other inputs from leaching into natural bodies of water, which can harm human and animal health.

What Are the Challenges Involved in Farming?

- **Pests and diseases threaten crop growth and health.** Crops inevitably attract pests (organisms that feed on or attack plants). Pests include insects and animals (e.g., birds and rodents), other plants (e.g., weeds), and disease pathogens. Pests can change and evolve along with their local ecosystem. As such, all crop farmers must carefully and continuously monitor pests and develop methods and tools to manage them to preserve crop health, marketability, and profitability.
- **Soils must be closely supervised and managed to produce crops.** The health and condition of soil is central to crop production. The right type of healthy soil enables crops to absorb the nutrients and water they need to grow and prevents and reduces erosion and material runoff into bodies of water. Crop production, however, necessarily extracts essential nutrients from soil. Nearly half (45 percent) of soil nutrients derive from minerals that have broken down over millennia into forms that plants can use, which makes maintaining and restoring the nutrients in soils critical to success.

- **Weather and climatic conditions significantly affect crops but are unstable and impossible to control.** Weather and climate are challenging to manage and predict. Factors like temperature and rainfall vary considerably across time and space. Temperatures can drop much earlier than expected, and rainfall is much larger in some years than others. Additionally, extreme and unseasonal weather events, such as freezing temperatures, hail storms, and droughts, are becoming more common and more dramatic due to climate change. This creates enormous risk in crop production, which is borne largely by farmers. An early freeze or untimely violent storm can result in catastrophic loss of income. Thus, farmers must constantly monitor local weather and climatic conditions.
- **Market and regulatory demands can be difficult to meet.** To be successful, crop farmers must be attuned to the particular crops that consumers, retailers, and other buyers want, how much they are willing to pay for them, and the legal regulations and standards governing pesticide use and other farming practices. Not only do these factors change, but they also conflict with the practical realities of farming. The market has recently demanded, for example, that fruits and vegetables look perfect. But meeting this standard is difficult, and often motivates farmers to apply pesticides sooner and more frequently than they would otherwise.
- **Adopting practices that benefit the environment and society can be expensive.** Farmers must be certain that adopting or switching to a new tool or method will not make crop production too costly. Practices that mitigate social and environmental harm often require considerable time, education, and resources to adopt and implement, and come with additional restrictions that constrain farmers' livelihoods. While some financial incentives encourage the adoption of beneficial practices, they typically don't outweigh the economic risk they carry.
- **Producing crops involves serious health and safety risks.** As with most human endeavors, some practices required to produce crops are dangerous. These practices can injure farmers and farmworkers and cause chronic diseases. Many regulations and practices are in place to mitigate health and safety risks.

How Can Farmers Effectively Meet the Challenges of Farming?

- **They can evaluate and use practices based on multiple dimensions of *sustainability*.** Farmers are increasingly considering the long-term consequences of their practices. Evaluating the sustainability of these practices helps farmers account for the factors they must consider when producing crops and the challenges they face. Key dimensions of sustainability include:
 - *Environmental sustainability.* Sustainable practices are less harmful to and/or enhance the health of the environment.

- *Economic sustainability.* Sustainable practices allow crop farmers and farmworkers to maintain a decent standard of living; it should not be costlier for farmers to produce crops than to sell them.
 - *Social sustainability.* Sustainable practices maintain or improve quality of life; they consider the health and wellbeing of all involved in the production and consumption of crops, which includes people ranging from farmworkers to consumers.
- **There are many approaches to sustainability.** On the farm, and in practice, different approaches to sustainability blend together to address long- or short-term problems. In the marketplace, certifications and promotions differentiate products and verify certain standards to identify and distinguish different approaches to sustainability used in production. Some approaches are based on allowable or prohibited materials; some on best or required practices; and some incorporate aspects of both. Experts mentioned the following approaches and practices:
 - **Integrated pest management (IPM).** IPM is a decision-making process involving farm ecology, scientific measurement, and risk assessment that guides farmers in sustainable pest management. Over 50 years, a global community of scientists and farmers has established this framework that can be used effectively on a wide variety of crops and in many locations.
 - **Organic farming.** Organic farming is a philosophical approach that prioritizes *environmental* sustainability. Organic farmers seek to produce crops by means that maintain and enhance the biology of farming systems, especially soil quality. A distinguishing characteristic is restricting fertilizers, pesticides, and other material inputs to those that are either derived from naturally occurring sources or synthetic materials that have been approved according to particular criteria. Certified organic farmers, by definition, use certain synthetically derived materials, and they typically only use them when other approved methods are ineffective. *Complete* elimination of synthetic materials is not essential to the underlying principles of organic farming, and many organic farmers also use IPM practices and strategies to manage pests, including the judicious use of pesticides. The existence, visibility, and market-based promotion of organic certification has increased public awareness and understanding of sustainable farming. Nevertheless, experts stressed that organic is not the only sustainable approach available, and that organic farming faces its own challenges to sustainability, such as those relating to crop yields, production costs, shelf price, and more.
 - **Environmental sustainability.** Many of the basic principles and practices that underlie IPM and organic farming are relevant and useful, if not essential, to other kinds of sustainable farming. These include:

- **Pests should be managed, not eliminated.** Farms are human-created ecosystems, and pests are inevitable. Their total elimination is neither feasible nor necessarily desirable, as pests play an important role in keeping local ecosystems and crops healthy. An explicit goal of IPM is to keep pests at a manageable and measurable level.
- **Pest management should be scientifically informed.** Effectively managing pests requires gaining and applying deep knowledge of (1) the biology of local pests, (2) the effects of weather on pest development, and (3) the technologies and methods that farmers can use to manage them. It also demands a solid grasp of the environmental and economic conditions that minimize environmental, social, and economic risks.
- **Pests should be managed only when, and only to a level at which, economic viability is threatened.** The damage that pests can inflict—and that can be tolerated—varies considerably. Some pests, for example, feed directly on the marketed product, so very little damage can be tolerated due to strict consumer and market demands. Other pests, in contrast, feed on the plant that produces the product, so considerable damage can be tolerated before it becomes cost-effective to intervene and reduce pest density. In other cases, pests may damage trees, soil, or future crops, allowing virtually no room for tolerance. Thus, actions to manage pests should depend on financial tolerance and taken only when and to the extent that it becomes costlier not to act. This is a fine balancing act, because pest levels vary from year to year and from farm to farm, economic thresholds for many pests have not yet been firmly established, and consumer expectations regarding pesticide use shift over time.
- **Methods to manage pests should be selected and used based on their efficacy, cost, and sustainability.** IPM includes a variety of tools and methods, including both synthetic and biologically based pesticides. Regardless of method or tool, pesticides should be selected and used in a way that poses the fewest risks to the environment, farmworkers' and consumers' health, and farmers' and farmworkers' livelihoods. Certified organic growers take a similar approach, but they must select materials approved by the US Department of Agriculture's National Organic Program and use pest management methods allowed by national organic standards.
- **Planting cover crops and rotating and diversifying crops.** Certain "cover crops" can be planted to restore nutrients to soil, disrupt the build-up of pest populations, and increase soil organic matter. Adding organic matter improves the functioning of beneficial microorganisms, which improves airflow and enhances the soil's ability to absorb and retain water. "Trap crops," meanwhile, attract pests so they don't attack cash crops.

- **Reducing or eliminating tillage.** Tillage, defined as the use of tools and machines to dig up soil, can either enhance or undermine environmental sustainability. Tillage removes weeds and some pests, which reduces the need for pesticide use, but it also disrupts and can decrease overall soil health and, in some cases, facilitates the build-up of some soil pests. Some farmers see tillage as a serious threat to successful crop production and therefore reduce or avoid it.
- **Social sustainability: farmworkers.** Farmers, especially those who own small and mid-size farms, often do similar work as the people they employ and face similar health and economic risks on the job. On most farms, however, harvesting, grading, packing, and, in some cases, planting, is not possible without a dependable force of skilled laborers. These farmworkers are essential to farming and should thus be paid sufficiently and given safe, healthy working conditions.
- **Economic sustainability: the “cost-price squeeze” and farm viability.** A dynamic tension exists between (1) the basic costs of production that farmers pay for equipment, inputs, and labor, and (2) the prices that farmers can set in the marketplace, and the two are not directly related. Economists refer to this as the “cost-price squeeze” because costs, averaged over time, have risen faster than the prices farmers have been able to set. Farmers often have difficulty paying their bills when they invest in sustainable economic practices, such as paying farmworkers a living wage, hiring only US citizens, and maintaining ecosystem services to enhance the landscape, soil, air, and water. They rarely receive acknowledgement from society in the form of higher prices in the marketplace. Furthermore, social and political conditions and policies, at times, act as disincentives to farmers, preventing them from investing more in sustainable practices.
- **Economic sustainability: affordable food.** When the price of fruits and vegetables increases, consumers, especially those with lower incomes, may have more difficulty accessing healthy food. In other words, the goals of farm viability and the widespread availability of affordable, fresh food, are in tension and often conflict with one another.
- **Economic sustainability: locally grown.** Farms of all sizes add economic and social value to their local communities through (1) taxes, employment, spending, and involvement with local businesses and activities; (2) marketing directly to consumers; and (3) adopting wholesale marketing practices to satisfy demand for locally grown crops with farm-identified packaging, labeling, and promotion.

What Should Society Do to Help Meet the Challenges of Farming?

- **Adopt an approach to sustainability in public evaluations and policymaking that recognizes that farming and food production operate at the complex nexus where ecology and nature meet the marketplace and political systems.** Sustainability must be approached in an informed and balanced manner that is *sensitive to context*. Practices that have clear, positive effects on the environment may be more feasible and pose fewer economic costs when used with some crops, and in some climates, than with others. All farming practices and policies require trade-offs. Efforts to improve sustainability must also balance potential gains and consequences.
- **Increase public knowledge of farming.** Most members of the public don't know what farming involves or how food is produced. Strengthening public understanding of farming will help people understand and advocate for policies that enable farmers to overcome challenges and meet public needs, and help people make more informed consumer choices. This likely requires engaging children—including the very young—in agricultural education, hands-on gardening, food preparation, and farm visits. These powerful educational experiences will help build lifelong curiosity toward food and food production.
- **Promote locally and regionally grown food.** This means promoting general concepts of farms and the landscape, farmers and their role in communities, and farm products and their contribution to public health and the economy.
- **Better engage farmers as a resource for research and policymaking.** Farmers' experiences and perspectives are unique. However, farmers don't have enough opportunities to participate in the development of research and policy. Experts called on land grant colleges, extension programs, and public officials to draw more heavily on the insights and experiences of farmers in the design and implementation of research and policies.
- **Conduct more research to identify effective farming practices.** A great deal remains to be learned about farming practices. This knowledge gap can be filled by increasing agricultural research and programs that can effectively educate farmers about sustainable practices. Experts cited the need for more research and education on topics including: the effects of soil health on crop production, how to enhance soil health, how to produce fruits and vegetables more efficiently, how to manage new and invasive pests and diseases, and the economic costs of and benefits to farmers of adopting certain practices.

The Untranslated Expert Story of Farming

What is farming?

- Farming provides a primary source of food.
- Farming is a business.
- Farming is diverse in scale and practice.
- Farming involves complex decision-making and risk- management.
- Farmers are applied scientists, mechanics, and managers who have a diverse and unique set of skills and knowledge.

Why is farming important?

- Farming is an integral part of human culture.
- Farming is an important part of the economy that affects the livelihoods of many people.
- Human survival and health depend on farming.
- Farming affects the health and quality of our natural environment.
- Farming practices can either enhance or degrade the health of soil, water, and air.

What are the challenges involved in farming?

- Pests and diseases threaten crop growth and health.
- Soils must be closely supervised and managed to produce crops.
- Weather and climatic conditions significantly affect crops but are unstable and impossible to control.
- Market and regulatory demands can be difficult to meet.
- Adopting practices that benefit the environment can be financially costly.
- Producing crops often involves serious health and safety risks.

How can farmers effectively meet the challenges of farming?

- Evaluate and use practices based on environmental, economic, and social sustainability.
- Consider various approaches to sustainability (e.g., integrated pest management, organic farming).
- Environmentally sustainable practices include scientifically informed pest management practices that take economic viability into account, planting cover crops, and minimizing tillage.
- Social sustainability requires ensuring that conditions for farmers and farmworkers are safe and healthy.
- Economic sustainability depends on ensuring that environmentally and socially sustainable practices are economically viable for farmers.

What should society do to help meet the challenges of farming?

- Take an approach to sustainability in public evaluations and policymaking that recognizes that farming and food production operate at the complex nexus where ecology and nature meet the marketplace and political systems.
- Increase public understanding of farming.
- Promote locally and regionally grown food.
- Better engage farmers as a resource for research and policymaking.
- Conduct more research to identify effective farming practices.

Public Understandings of Farming

In this section, we present the cultural models—shared but implicit understandings, assumptions, and patterns of reasoning—that shape how Americans think about farming. This analysis was informed by 24 in-person, in-depth interviews with members of the public in California, Georgia, Illinois, and Maryland. (Please refer to the Appendix for more information about the sample and research methods.)

In exploring cultural models, we are looking to identify how assumptions embedded at the bedrock of American culture structure how people reason about farming. This exploration differs from standard public opinion research, which studies *what* people think. Cultural models research, in contrast, studies *how* people think. In other words, this research investigates the structures that explain how people arrive at conclusions, rather than studying the conclusions themselves. In doing so, we gain a deeper perspective on *why* people think the things they do, which helps us understand how we can shift thinking around farming in fundamental ways.

CULTURAL MODELS

Cultural models are deep-seated patterns of thinking about a given topic that are shared across a culture. They are taken-for-granted, automatic assumptions that people rely on to interpret, organize, and make meaning of the world.

People hold multiple cultural models about any given issue. *Dominant* models more consistently shape thinking, while recessive models are more often in the cognitive background.

Importantly, people have multiple ways of thinking about farming. In everyday life, people toggle between perspectives, drawing on different assumptions at different times. Some ways of thinking are dominant, more consistently and powerfully shaping how people think and reason. Others are recessive; they are less top-of-mind and more easily pushed out of thinking when a dominant perspective is activated. In a single conversation, people may shift back and forth between conflicting models, which helps explain why people sometimes hold seemingly contradictory attitudes about the same issue.

Also, while our research suggests that the models described here are commonly held, there is also variation in their dominance or recessiveness among particular individuals or groups. Differences in thinking arise not from the presence or absence of these models, but rather from their strength. Americans access all of the models in this report, but they might hold and use them to different degrees, which makes some of them stronger than others.

Understanding the landscape of cultural models gives communicators an important tool. Productive models facilitate a fuller understanding of farming and generate support for recommended practices, policies, and programs. Unproductive models impede understanding or depress support for recommended solutions. This research enables the field to frame its messages so they leverage productive

ways of thinking, push unproductive ways into the background, and fill in understanding where needed. This is the essence of strategic framing.

We begin by describing *foundational* models that Americans draw on to think about farming. These models underpin the public's understanding of farming at the deepest level. We then explore patterns of thinking that shape the public's views about how farming works and what it involves, including how people think about the role of government, which has important implications for how people think about what can and should be done to improve farming. Finally, we outline how thinking about farming can be supported or improved and trace how these ideas follow from different cultural models.

Foundational Cultural Models

Our analysis revealed several foundational cultural models of farming. These models determine how members of the public situate farming relative to other parts of life, or rather what *type* of issue people think of farming as.

▶ **The Good Food = Healthy Food Cultural Model**

When people think about food, they typically evaluate it through the lens of human health, equating good food with healthy food. Beyond keeping people alive, good food is understood as food that is *good for you*; it leads to positive health outcomes, or at least does not lead to negative ones. In contrast, bad food detracts from health or leads to negative health outcomes.

Participant: Food to me would be something that you consume that gives you nutrients, that gives you energy, that helps you grow. I have a little one, so I try to get her good foods. You know, foods that I want to assist in her growing and developing. I think that that's very important.

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Participant: Good food to me is foods that are healing, that will help you heal, [...] food that is good for your body. It's not going to be clogging up your heart and things like that. That's what I mean when I say "good food."

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This model leads people to evaluate farming in terms of its ability to produce healthy food and to think that the primary purpose of farming should be to promote consumer health—or at least avoid harming it. People assume that good farming is farming that produces healthy food and that improvements to farming should prioritize enhancing consumer health above all else.

Participant: I think that the goal [of policies and programs related to farming] should be to produce the most healthful product and not necessarily the most product. I think that you should be trying to produce the most healthful thing; that should be the paramount thing.

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Researcher: What would you say farmers are responsible for doing?

Participant: For ensuring quality. Ensuring that they are adhering to practices that would not harm Americans—or all people, not just Americans.

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Researcher: Why does it matter whether or not we grow crops in one way versus another?

Participant: I think it matters because it's our food source and our energy source. It affects how we live. It affects whether you live a healthy life versus an unhealthy one. It affects, in a lot of cases, whether you get sickness or disease or not.

▶ **The *Natural vs. Human-Made Cultural Model***

Members of the public define nature and human society in opposition to one another.⁷ “Natural” means untouched by human beings and is understood as pure and healthy. Human intervention, by contrast, pollutes and defiles nature.⁸

This way of thinking leads people to assume that food production in general, and farming specifically, should involve as little human intervention as possible and the use of few, if any, human-made substances. Seeing nature and human society in opposition causes people to think that less human intervention and fewer synthetic substances are better for the environment. While most participants viewed farming as necessarily disruptive to the natural environment, they also distinguished farming practices by degree. Less “natural” practices, especially the use of chemical pesticides and fertilizers, were assumed to be inherently more harmful to the environment.

Researcher: How would you say the environment is affected by farming?

Participant: Well, it depends on what pesticides or fertilizers they use. If they're chemical, adding a chemical to something is going to have an effect. [...] Nature's had a way of doing things for so long, and here we come and start throwing this and that in there. We're messing with natural processes.

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Researcher: Do you think that the way crops are grown has an effect on the environment?

Participant: I would say so, especially if you use pesticides, because they can have those harmful chemicals. The environment is the most natural thing we have, so when you start to manipulate it more, it could change the soil or certain things about the environment.

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Researcher: Is the environment better or worse off based on how we grow crops?

Participant: I think the less chemicals you're using, the less chemicals you're putting in the air, the better for the environment. More natural.

Drawing on this model, people also believe that less human intervention makes for purer and cleaner food, that it's literally and figuratively better for the body *and* soul. Thus, genetically modified crops and the application of pesticides, fertilizers, and other chemical substances are seen not only as unhealthy to humans and the natural environment, but also as morally questionable.

Participants frequently drew on this kind of thinking, distinguishing good food as more “naturally grown” food. Many described how augmenting fruits and vegetables during farming through technology or chemical substances depletes nutrients or somehow makes them less healthy, unsafe, or unfit for human consumption. As a result, people concluded that these tools ought to be used sparingly, if at all, in the growing of crops.⁹

Participant: Why does a fruit or vegetable need any help? Why can't it be grown the way that it was intended—the way God saw fit? [...] I just don't think that we're designed to eat it any other way. [Food] should just come from the ground, and we should be able to eat it. It shouldn't have to be pumped up with something to make it grow bigger or faster. [...] It's not necessary.

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Participant: I think some of the ways that we're affected by the choices that farmers make to grow their crops, the biggest things, I think, are things like the choices of water that they use and what's in the water, what they spray it with, like synthetics, and what's in the soil. I think that all those things affect the end game. And then we consume it. Again, our bodies don't know how to process all the crap.

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Researcher: Why do you think fruits and vegetables taste better when they don't use any pesticides?

Participant: Because it's more natural. There aren't any [...] harmful things added to them.

Organic and Local = Natural and Pure. The *Natural vs. Human-Made* model is the foundational model that shapes thinking about organic and locally grown food. In this sub-model, which reflects a pattern of thinking within the larger *Natural vs. Human-Made* model, people equate organic and local with “natural” (i.e., using few, if any, human-made materials and substances). In turn, people think of organic and locally grown produce as purer—as healthier and, implicitly, morally preferable because it does not pervert nature.

Researcher: What would you say makes for good food?

Participant: I would say that healthy is a big part of it. [...] I have never had organic food, but I would say organic. People love organic food—stuff that's healthy, stuff that's not manipulated and stuff like that.

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Participant: To me, organic means you're not using any products or chemicals or pesticides or fertilizer-type chemicals. Just letting it grow natural.

Researcher: Is that a desirable way to grow things?

Participant: I would think, yeah. I would imagine so because you're getting the best quality of that product if you're getting it from more of a natural state rather than having a lot of chemicals in it. I would imagine it's going to taste fresher. And you're going to get more of the proper taste of it, and it's going to maintain all your nutrients and vitamins and everything.

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Participant: If it's locally grown, you pretty much know what you're going to get [...] because you pretty much can know the farmer and you know how he gets up every morning, how he tends to his crop and his field. And you know that that person is doing the best that they can to make sure that this product is done right.

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Participant: I would advise you to look at what's locally grown versus what's been imported in. [...] Because imported in, you know, they may have added a little bit of chemical or something to withstand the longer journey and shelf life, whereas if it was locally grown, the field is maybe two miles away. It comes directly from field to market.

▶ The Threat of Modernity Cultural Model

When thinking about technological innovations in farming, people often think temporally, situating farming within a process of civilizational development and modernization. People recognize that farming itself is a relatively recent development in human history and view this development in largely positive terms. Farming is seen as a major accomplishment that gives us a more efficient, stable means of feeding ourselves and seemingly ever larger numbers of people around the world.

Participant: [Without farming] people would be nomads. They'd still just be living off the earth and getting whatever they could, which is a pretty inefficient means of getting and maintaining food sources. That's why we came up with farming, because it's more consistent and reliable.

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Researcher: Would you say farming is important?

Participant: It's very important, because if it weren't for farming we wouldn't have many things to be able to eat. You wouldn't have the convenience of just going wherever you want to get whatever you want to eat.

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Researcher: Would you say that farming is important?

Participant: Would I say it is important? Yes. It's very important. Without farmers, how would we get a lot of our food? We need food to survive. We need to eat. We have to have them.

Yet, when people think of *contemporary* advances in farming, the understanding of farming as progress is replaced by a sense of threat.¹⁰ *New* technology (e.g., machine labor, chemical pesticides, and other human-made substances) is understood as harmful. This way of thinking at times draws on the *Natural vs. Human-Made* model in that modernization is seen as moving *farther* from nature. But this model has other dimensions as well, including the idea that we're moving away from a simpler and purer way of life in which farming supported whole communities. People recognize that modernization both benefits and threatens health and threatens a sense of shared identity and community cohesion.

These dimensions were apparent when participants linked modern farming practices to increases in health problems, such as cancer and food allergies, and to job loss and economic hardship among farmers.

Participant: I've taught school for 30 years. I never had a child who was allergic to peanuts. By the time I retired, though, I had EpiPens all over my classroom. I think it's strange, and I don't know enough to know what it is, [...] but something isn't right that has affected humans from whatever farming practices.

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Participant: I feel like farming used to have a lot of jobs available for people, but now not so much. Just because with having all the machines that can get our job done that would usually take 20 people and getting it done in seconds.

Researcher: Would you say that's a good change or a bad change?

Participant: It's like a 50-50 type of thing for me. [...] It's bad for all those people that had jobs. [...] But for the farmer, good for them. They have more money. So, I don't know.

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Participant: I feel bad that the big corporations are squeezing out the family farm and the people that have done this for generations and love their farms, and wanted to pass this on. On the other hand, I realize that it's a huge country and that we have a lot of mouths to feed, and it probably can't all be met by the family farms anymore. That there just aren't enough people that want to do that.

This model leads people to have a strong sense of nostalgia about simpler farming practices, and people often view organic and locally produced food through this lens. When using this model, people view organic and locally produced foods as a way to return to “the old days” or “the basics” of farming.

Participant: I think we need to develop a way where we can go back to the olden days, where the farmers just naturally plant the seeds without adding pesticides or any harmful chemicals to it. Because as a kid, we had regular-sized tomatoes; we never had no oversized tomatoes that we have now, almost big as a watermelon. [...] In the earlier days, you got a natural tomato, and now tomatoes have a different taste, a much different taste than the organic that don't have pesticides on them.

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Participant: Food now is generally produced on farms that used to be owned by families. And it was sort of a homey United States, all-American kind of thing to be a farmer. Now, it's a lot more corporate and a lot less family farmers, and there's a lot more pesticides, and GMO, and a lot more augmentation and alteration than maybe 50 years ago when I was a kid.

► The Consumerism Cultural Model

In this model, food is understood solely as a consumer product. From this perspective, the farming and food system is assumed to be a free marketplace that is directly responsive to consumer preference.¹¹ In this way of thinking, the food supply (i.e., which food—and how much of it—is produced) and food practices (i.e., how farmers and the food system produce food) are driven by profit, which is determined by consumer preference. The model assumes that markets are purely private, shaped entirely by supply and demand and the choices of buyers and sellers. It obscures the role that structural factors play in shaping the market rules and incentives, such as government subsidies and requirements for organic and other certifications.

Researcher: How do farmers decide which crops to grow?

Participant: It depends on them. It depends on how much money they're trying to make. A certain crop might produce different financial benefits. [...] I would grow a variety, since it depends on what product might be popular at that time. You could be making money on that because sometimes particular products fall in and

out of the fad of what people are eating at that particular time.

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Participant: I don't think one crop is more important than another one. I think there are some that we consume more versus ones that we don't. And that kind of dictates pretty much how we produce. Like with grains, that's something that we all eat pretty much daily, and a lot of it. And, for some people, vegetables are not something that they eat a lot. So, there's probably no need for them to hurry up and figure out a way to mass produce it for them. [...] Regardless of how big the supply of something is, if the demand is high for it, supply's always going to be high for it regardless of anything else.

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Researcher: How do you think farmers decide whether they are going to grow organic versus other kinds of crops?

Participant: I think it's all about making money. [...] I know that if I use organic, my tomatoes are going to be healthier, they are going to be fresher. But, if I use a chemically grown crop, I could take it to a hot house and make millions of dollars using the genetically modified tomatoes, much more than I could with naturally grown organic. Most of the time people are not going to be able to afford to purchase the organic product because it costs more to maintain than to grow.

The idea that farming practice directly responds to consumer preference leads people to assume that problems with the food and farming system—and the responsibility for addressing them—lies not with government or the farming and food industry but with consumers. Rather than voting, protesting, or advocating for policy change, individuals must educate themselves and change how they shop for food if they want to change or ensure good farming practices.

Researcher: What sorts of things do you think can help to make sure that the food we have is good?

Participant: People's awareness and people being accountable, instead of looking to everyone else to take care of that for them. I think that there are people that think, if it's in the store, then it's edible. And they don't take any accountability. They don't take any personal accountability for what they're putting in their bodies. When they get sick, they're happy to run and blame someone else.

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Participant: People vote with their dollar, whether people acknowledge that or not. [...] Ten years ago, if you told somebody I want to eat organic food, most people would not know what that is. [...] But, people have been voting with their dollar, and that has dictated how things are grown.

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Researcher: Would you say that members of the public have any responsibility for improving the way that crops are grown?

Participant: Yeah. You need to speak up for yourself. [...] The easiest way is just don't participate, meaning, don't buy a product from a company. [...] It'll affect profits. It'll affect everything that they care about and that will move them more than moral reasons will, and morality or anything like that would.

Implications of Foundational Cultural Models for Communicators

1. **The *Good Food = Healthy Food* model focuses attention on the health effects of farming and obscures its environmental and economic effects.** Communicators can productively leverage this model when discussing consumer health, but they should avoid activating this model to bring attention to other effects, such as the health and economic wellbeing of farmers and farmworkers and the protection and enhancement of the environment.
2. **The *Natural vs. Human-Made* model restricts understanding of good farming practices.** This way of thinking yields skepticism about the use of technology and chemicals in farming, which leads people to reject whole categories of farming practice and to automatically favor “organic” and “natural” food over alternatives. This makes it difficult for people to see that different practices are appropriate in different contexts and that technology and chemicals can, in many cases, improve health and protect the environment. Disrupting the natural vs. human-made binary and opening space for a more accurate assessment of farming methods is perhaps the most important—and most challenging—task for future research.
3. **The *Threat of Modernity* model flattens modern farming practices and romanticizes “simpler” farming.** This model, like the *Natural vs. Human-Made* model, leads people to believe that farming is mostly dominated by large-scale, corporate farms and to assume that modern farming practices are fundamentally harmful, which leads them to be generally critical of farming and technological innovation. In turn, the model stirs up nostalgia for the past, which makes it hard for people to see the possibility of future progress in farming practices. Communicators need strategies to help people see that some modern farming practices have both harmed and benefited health, the economy, and the environment.
4. **The *Consumerism* model obscures how policies shape farming practices.** This model enables members of the public to recognize farming as a business but not the role of policy in structuring the market, which constrains public thinking about how to improve farming practices. When talking about the business of farming, communicators must highlight and explain how subsidies and regulations shape the market to enable the public to recognize that changing farming practices on a large scale requires changing farming policy.

Cultural Models of Farming

When participants were asked to think more specifically about what farming involves and what farmers do, they drew on models about the relationship between farming and nature; between farmers, farming practice, and pest and soil management; and between farming and the government.

Cultural Models of Farming and Nature

► **The *Natural Determinism* Cultural Model**

Participants frequently assumed that farmers are at the mercy of nature. In this model, nature is figured as an uncontrollable force that is almost wholly responsible for determining farming outcomes.¹² Which crops get grown, whether they grow as necessary, and how they are grown are thought to be mostly, if not completely, determined by the natural environment, which encompasses not only weather but also other seemingly more controllable aspects of the natural environment, such as pests, soil, and seeds. When drawing on this model, participants suggested that there is little that farmers do or can do to control and manage the growth of crops.

Participant: [Farmers] just have to roll with the punches, to tell you the truth. If it's not raining or what have you, they can go out there and try to water a crop, but, like I said, there's only so much you can do. Then, when it gets cold, there's really not much they can do, because you can't bring the crop inside or protect it from the cold because that's impossible. You just have to roll with the flow.

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Researcher: Do farmers need to be worried about pests?

Participant: Not necessarily worried. Something that they should be, you know, aware of and think about.

Researcher: Why not?

Participant: You can't control them. They're going to be there. They're just going to be there. [...] You can't control everything.

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Researcher: Do you think there is anything farmers should do specifically or should not do when they are growing crops?

Participant: No, I think they should just let nature take its course. Because, first of all, you can't do anything about the weather. The weather plays a major role in growing crops, so there's really nothing you can do about it.

► **The *Scientific Control* Cultural Model**

While people are often skeptical of farming technologies developed by humans, they also think of science as a positive tool that can be used to control nature and improve food quality.¹³ In contrast to the *Natural Determinism* model, the *Scientific Control* model assumes that farmers can use technological and scientific advances to overcome or adapt to limitations imposed by the natural environment. In this way of thinking, farming relies on scientific innovation and creativity.

Participant: A heat lamp allows us to grow a product in a way that could be something that you maybe couldn't grow where you are. [...] We can set up a whole room and heat lamps with a humidifier that is humidifying the environment, and we can grow that tropical plant in a building. And so, I think that things like this do have a good purpose. In a more apocalyptic sense, we are preparing ourselves to grow plants in environments that may become unfit for growth.

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Participant: What some scientists do is they've studied the DNA, the structure of the plant, and they've figured out how they can alter it to be more robust. And it can be drought-tolerant and require less water. It can be bug-tolerant, so it can be tougher and doesn't get affected by the different types of bugs that attack it.

Implications of Cultural Models of Farming and Nature for Communicators

1. **The *Natural Determinism* model undermines recognition of how farmers can manage or enhance the natural environment.** This model rightfully acknowledges that farmers cannot predict or wholly control the natural environment, but it leads people to conclude that there is little that farmers can or should do to manage or cope with natural complexity. In turn, it leads to an underappreciation of the expertise involved in farming and obscures the various strategies that farmers can use to manage and respond to the environment. Communicators should be careful not to overemphasize the unpredictability of nature, as doing so will likely cue this model and make it hard for people to recognize the range of techniques that farmers use.
2. **The *Scientific Control* model encourages appreciation for science and technology in farming and optimism about improving farming.** This model helps people see that science and technology can play a positive role in farming, in contrast to the negative ways of thinking about technology discussed above. (See the *Natural vs. Human-Made* and *Threat of Modernity* models.) Moreover, it can help overcome fatalism about the natural environment and encourage an understanding of the ways in which different farming practices serve to both manage and enhance it. Communicators must find ways to cue this model and to leverage it to explain modern sustainable farming practices.

Cultural Models of Farmers

When members of the public think about farmers and the work they do, they draw on two models, both of which position farmers and the work of farming as *exceptional*; that said, people reason about *exceptionalism* in slightly different ways.

► **The *Hard Laborers* Cultural Model**

At times, participants distinguished farming from other work by focusing on the grueling physical labor they associate with it. When thinking in this way, people focus exclusively on the physically demanding hands-on tasks that are directly carried out on a farm, such as planting seeds and tending to crops, and they think little of the complex judgments involved (e.g., choices about farming methods, business

decisions, etc.). In other words, this model leads people to see farming as difficult but fairly simple and straightforward manual labor. When drawing on this model, people think of farming as something not everyone can—or perhaps wants—to do because it is so physically demanding and time-intensive.

Participant: You're up, you know, the whole kind of up in the morning. You're working with your hands. It's laborious. It's laborious, long days.

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Participant: Because every farmer I've ever known in my life works seven days a week from before sunup and after sundown. They just live a hard, laborious life. There's a lot of physical labor that goes into it.

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Participant: Farmers. Yeah. I think anyone that is in the farming business, when they're directly involved with growing the food, they're considered a farmer.

Researcher: What if you just do the business side and you own the farm? Is that also a farmer, or is that something else?

Participant: No. They just work at a corporate office that deals with farming. They're not a farmer.

► **The *Loving and Ethical Cultural Model***

This model of farming assumes that it is about love; to farm is to create food through loving or caring for plants and the environment. In other words, farmers are people who are passionate about feeding the world and caring for the natural environment. Because only humans can provide this kind of love and care, farming ought to be carried out by humans, not machines. Participants regularly used language relating to love and care when discussing farming, even analogizing it to raising a child.

Participant: [Farmers] seem to care about what they do. To me, they have a passion for what they do, you know? So, can you get somebody to just walk off the street and give you some good vegetables? Grow you some good vegetables? You can't get anybody to just walk off the street and know that.

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Participant: I'm not going to take a pill to make my baby grow faster. It has to develop. It has to take its time. It has to be nurtured and loved. A plant has to be nurtured and loved for it to become the greatest fruit or vegetable it can be.

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Participant: Humans have an ability to care. They have an ability to reason where machines don't yet. They're getting there, but they aren't there yet. [Farming] is a job for a human. [...] And if something were, say, really, really wrong, they might notice it before some automated process would.

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Participant: I think farmers are very hard workers, and I think they have a love for food in the sense they like to produce a crop that people will enjoy eating and would be healthy for them.

By this way of thinking, good farmers care about their products and have strong moral fiber; they do things the right way and put ethics over profits. On the flipside, bad farmers don't care about the quality of their products and put profits over ethics.

Participant: I want whoever's growing that apple, how they take care of it, having a kind of pride in the work they do. Not somebody who is just like, "We just need 5 million tons of apples, and I don't care how we get there, we got to get there," but somebody who wants that apple to taste really good, and somebody who wants it to smell good. That's who I want producing my food.

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Participant: I think it depends on whoever's running the company. It's more whether or not they really—it's a choice that they make whether or not they care enough. If they care more about making sure their products are good quality, versus like the money aspect of it. I think for some people they just don't really care about their products. As long as they're making money off those products, they'll do whatever.

Implications of Cultural Models of Farmers for Communicators

1. **The *Hard Laborers* model leads to an underappreciation of the skills and expertise that farming requires.** When people use this model, they recognize that farming can be challenging work, but they reduce farming to manual labor and don't see the range of skills that farmers need or the complex judgments they have to make. Communicators must be careful not to overemphasize the physical hardships of farming, as doing so will likely obscure other aspects of farming work.
2. **The *Loving and Ethical* model romanticizes farming while obscuring the day-to-day work of farming and what shapes it.** Although this model encourages a positive view of farmers, it leads the public to think that good farming practices are solely a matter of a farmers' commitment to producing good food—or whether, and how much, they care about quality. The structural factors and context that enable or impede good farming practices, and actual farming practices, remain out of view. To prevent the public from focusing solely on the character of farmers, communicators must foreground the structural determinants of farming and explain what farmers actually do and why they do it.

Cultural Models of Farming Practice

When participants were asked to reflect on what farming involves in practice, they drew on three distinct cultural models that position the skills and knowledge involved in farming in very different ways.

▶ **The *Farming as Craft* Cultural Model**

Participants sometimes described farming as a learned practice—a craft that involves specialized know-how that can only be learned through direct, personal experience. Through immersion in the daily practice of farming, farmers develop a particular set of skills and knowledge. This model is most salient when people think of farming as an intergenerational familial enterprise. The crops that farmers decide to grow and how they grow them is thought of as a set of skills and knowledge that is “passed down” within families, as children essentially apprentice as they grow up.

Participant: I think it's difficult for people to just be a farmer if they don't know a farmer, if the family wasn't a farmer. [...] You don't just wake up and start farming and just know how to do it right. It's just not one of those things.

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Participant: I don't think anyone just sitting right here right now would be able to grow tomatoes, or grow cucumbers, or whatever for them to eat, because I don't think just anyone can do that. I think they give us what we need to live pretty much at this point.

Researcher: Got it. And this is a knowledge or skill?

Participant: It's a skill like that. Yeah. It's not, like, an everyday skill that everybody knows. It's something that only a slight group knows.

While people can think of farming as a craft, *how* this craft is learned and how farmers make decisions is unarticulated and misunderstood—a “black box” in the parlance of FrameWorks. In most cases, “passing down” knowledge is described in vague and passive terms that position farming as simply carrying on or repeating the work of earlier generations.

Researcher: How do you think that a farmer actually does decide what they're going to plant and grow?

Participant: I have no idea. If the family passed it down through the family. We're potato farmers. We're cow farmers.

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Researcher: Farmers raise crops or raise animals, either one, by farming techniques that they've learned usually from their ancestors about how to domesticate animals or to produce crops.

► **The *Farming as Formula* Cultural Model**

Members of the public sometimes think of farming as a rote set of tasks—planting seeds and ensuring they have enough water and sunlight to grow into healthy crops, and then harvesting, transporting, and selling them. When drawing on this model, people assume there is a right and a wrong way to farm; farming is about finding the “right formula”—figuring out the right seed, the right amount of water, etc. And, once this formula is known, it can simply be repeated. Farming is seen as a rigid set of steps that, once identified, can be easily implemented by following the formula; judgment is not required.

Researcher: Any ideas about what is involved in successfully growing crops?

Participant: [...] You have to have a plan. I would say, maybe, you write out a plan and you follow this plan every day. Then, you shouldn't go wrong.

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Researcher: Would you say farming is challenging or not so challenging?

Participant: I'll start with why it's not challenging. Why not? Because, to me, I'd like to think I already gave a pretty straightforward model of how to grow some plants. [...] And I don't really know anything about farming, right? You know, you can learn from what you see on TV or what you read in a book, or culture.

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Participant: If you follow the steps accordingly, you should come out with the perfect or close-to-perfect crop. And if you don't, it's because maybe some just didn't grow, or some didn't get watered the right way or too much, or maybe the seed was bad. Then you just scrap that and try again, pretty much.

► **The *Farming as Trial and Error* Cultural Model**

This third model of farming practice understands growing crops as pragmatic guesswork. What farmers do, and how they decide to do it, is assumed to be the result of experimentation, loosely defined. At times, experimentation is thought of like scientific research, in that it uses a formal and rigorous approach, while at others, it is thought of as simply trying things out until something finally works.

Researcher: How do you think that a farmer decides which things they are going to use?

Participant: I think, unfortunately, maybe some of it is just trial and error.

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Researcher: How do farmers learn what to do to grow crops?

Participant: I would say trial and error. They may lose a certain amount of crops until they finally get it right. So, I would say a lot of it is, what is it called? I guess a lot of note-taking.

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Participant: How do they decide the way they grow crops? Uh, I think whatever works. Whatever is going to get you the crop is why sometimes you grow it that way.

Implications of Cultural Models of Farming Practice for Communicators

1. **The *Farming as Craft* model needs to be expanded and filled in.** When thinking with this model, people recognize that farming is unique, specialized work. Nevertheless, people lack a real understanding of the skills and knowledge that farming requires. Communicators must build on this model by elucidating how farming is learned and what goes into it.
2. **The *Farming as Formula* model oversimplifies farming and obscures the role of contextual judgment.** This model assumes that the "right" steps, once discovered, can simply be repeated. This makes it difficult for people to see the skills required to manage contextually specific, ever-changing conditions. It undermines people's appreciation of the expertise involved in farming, so communicators should take care not to describe farming in terms that might activate it.
3. **The *Farming as Trial and Error* model oversimplifies how farmers deal with challenges but fosters a more scientific understanding of good farming practices.** Unlike the *Farming as Formula* model, this model allows people to see farming practice as flexible. When drawing on this model, people think of farming as constant and evolving experimentation and innovation, even if they do not have a sophisticated understanding of what is involved. Communicators can leverage this model to explain how farmers deal with challenges and how farming practice can improve and to help people see farmers as applied scientists.

Cultural Models of Pest and Soil Management

When asked about pest and soil management, participants most often focused on pesticides and fertilizers. Although they believed in and discussed other types of pest and soil management strategies, they were much less familiar with and had much less to say about these topics. When they thought about them, participants primarily drew on a single, dominant model: *Chemicals Are Dirty*, which follows from and is embedded within the *Natural vs. Human-Made* model.

► The *Chemicals Are Dirty* Cultural Model

Participants strongly believed that chemicals should not be used for either pest or soil management. Extending the logic of the more general *Natural vs. Human-Made* model, people assume that using chemicals to manage pests or soils makes crops harmful for human consumption and, to a lesser extent, for the environment, because chemicals are, by definition, *unnatural*.¹⁴ Using and consuming chemicals is toxic not only to human and environmental health but also to the soul. Chemical use is perceived to be morally wrong and against nature: it makes the environment and food impure or unclean. Participants frequently used binary terms such as “dirty/clean,” “impure/pure,” and “unnatural/natural” to distinguish between crops grown with and without chemical pesticides and fertilizers.

This model was especially salient and most frequently applied to pesticides; in other words, in the minds of most participants, pesticides *are* toxic chemicals.

Researcher: How would you describe what a pesticide is?

Participant: Pesticide is some form of poison that poisons the insects, but could also be poisonous to human beings.

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Researcher: What is a pesticide?

Participant: It causes cancer.

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Researcher: What’s wrong with having pesticides?

Participant: It’s not good for you. It’s not good for your body. It causes a whole bunch of unnecessary problems that your body doesn’t need.

Although participants did not entirely equate fertilizers with chemicals, they consistently applied this model to soil management; most people described treating soil with chemicals as equally harmful to using pesticides, including the health of soils, and opposed the use of chemical fertilizers to manage soils.

Researcher: Are some fertilizers natural versus chemical?

Participant: Yes. You know the more natural fertilizer that you can use, the better your harvest, the better your plant. The typical base fertilizer is what we talked about earlier, where they genetically modify crops, where they put something in there to try to boost their product much bigger than it naturally should be.

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Participant: Soil health? I guess the chemicals you use affects that. Like certain fertilizer could hurt the soil as well, because that's getting into the soil and I'm assuming that's going to make the soil not as productive because you're putting chemicals in it.

Researcher: Do you think soil that hasn't had any chemicals added is healthier than others?

Participant: Yeah, I would think that would be healthier.

Perhaps because pesticides are thought to come into direct contact with crops, participants also assumed that chemical pesticides in particular lead to *permanent* damage, making crops permanently harmful for human consumption. Multiple participants said that once chemicals have been used, crops will never be fully rid of them, taste the same, or have the same nutritional value as they might otherwise.

Participant: I do care if you're going to have a lot of residues from things that you've sprayed or injected to prevent pests, because that residue will be left on whatever type of crop you're producing, and that can be ingested by me or my family. I don't want that to happen. [...] What is the dirtiest fruit? The dirtiest fruit out there is the strawberry, because the strawberry has so many little potholes in it. And if you use pesticides on that, you're never going to get it all off. So, I, a thousand percent, want clean food that's pesticide-free.

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Participant: There's a taste, there is a taste. Because, me personally, I'm allergic to avocados and bananas. [...] But I realized that only happens with things that are not organic. So, when I ate an organic banana, I was completely fine. And it was a different taste. [...] I'm not sure if there is something else they are doing specifically to that vegetable or fruit that makes it taste different, like the pesticides or any of those things.

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Participant: Fruits and vegetables are not natural anymore [once you use pesticides], because you have that chemical now that's in it. That pesticide or chemical, that's going to get into the food and that's taking away from the nutritional value of everything. [...] I think you lose that nutritional value where the vitamins and nutrients that were in it are probably getting killed by that pesticide as well.

Implications of Cultural Models of Pest and Soil Management for Communicators

1. **The *Chemicals Are Dirty* model obscures differences among pesticides and fertilizers and prevents recognition that synthetic pesticides and fertilizers are ever necessary or appropriate.** People strongly believe that using synthetic substances in farming makes food toxic for humans to consume. People understand that different kinds of pesticides and fertilizers exist, but they tend to focus on synthetic or chemical substances. Explaining what pesticides, in particular, are, their effects, and why and how they are used presents one of the most difficult challenges for communicators. Research is needed to identify ways of communicating about the use of chemicals and, especially, pesticides that can foster a more accurate understanding of their benefits and dangers.
2. **The public's focus on chemicals crowds out thinking about other forms of pest and soil management.** Communicators need effective strategies to expand how people think soils and pests can be managed. This is a task that requires further research.

Cultural Models of Farming and Government

Participants drew on two models of government's role in farming, which offer very different ways of thinking about how government does—and can—influence farming practice.

▶ **The System Is Rigged Cultural Model**

When thinking with this model, people assume that large food and farming corporations, particularly chemical and processed food companies, have undue influence over the political system and policymaking process, manipulating policy to benefit the bottom line. In other words, food and farming policy reflects the interests of big corporations, because both industry and the political system are motivated by wealth and power more than anything else. Because people assume that what is healthy is not always, or ever, the most profitable, they are skeptical of existing food and farming policies and practices and believe that much of what happens is probably unhealthy or harmful to the public.

Participants used this model to explain the prevalence of undesirable practices in farming and food production—and particularly in pesticide use. However, this model was rarely applied or active when people had family-owned or smaller-scale farming in mind.

Participant: From what I've seen, they have very, very loose regulations on the use of pesticides and herbicides. It could be because, usually, the head of the FDA [Food and Drug Administration] has been a CEO or a former partner of some company that has developed those pesticides and herbicides. [...] They typically rotate in the head of the FDA as a former board of directors individual there. So, they're rather loose.

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Participant: The core of every evil we're dealing with in modern times is because our government is owned and run by corporations. I mean, we literally have senators that give bills that are written by a corporation. A lobbyist that hands it to them and they go try to pass it, word-for-fricking-word of what this corporation wrote. [...] And so, it's an entirely corrupt system, just entirely corrupt.

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Participant: I think that the Food and Drug Administration has an obligation to regulate and mandate farming, but I think it's just misconstrued by lobbyists and what their needs are.

This model induces pessimism about the prospect that governmental action can create meaningful change in the food and farming system. When drawing on this model, people can even become skeptical of government policies and programs they otherwise support in principle, such as organic certification.

Participant: And sometimes I, maybe it's the snake in me, but sometimes I wonder when I see organic, just how organic it actually is, you know?

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Participant: In terms of the chemical processing kinds of things and whatever toxins that leaves in the food that the FDA may think is okay for me, I'm not convinced.

▶ **The Government as Protector of Health and Safety Cultural Model**

People assume that the primary way in which government is—and should be—involved in farming is through health and safety regulations. What farmers can and should do is thought to be shaped by government regulations and surveillance, such as inspecting farms and grocery stores and banning certain practices or substances.

Importantly, participants unanimously said government has a *responsibility* to protect the health and safety of the public.¹⁵ While some participants were unclear about whether the government intervenes economically in the food and farming system, and how it does so, almost every participant discussed how government not only does, but should, regulate the industry to ensure that farming practices support consumer health and safety.

Participant: Again, from a safety standpoint and what's going into my body, there have to be more regulations [to improve farming].

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Participant: [...] I don't really like the government being able to tell anybody what is good or bad for them. But when it's affecting somebody else, like people's health in general, I think they should have some say in it.

Implications of Cultural Models of Farming and Government for Communicators

1. **The System Is Rigged model leads to fatalism about the possibility of improving farming practices.** While this model does provide members of the public with a somewhat useful framework for thinking about farming, it also generates skepticism about the possibility of meaningful and effective policy change. Communicators must find ways to redirect people toward thinking about how government and farmers can and have worked together to ensure good practices.
2. **The Government as Protector of Health and Safety model limits thinking about how government can and does influence food and farming.** This model enables the public to recognize a positive role for government in supporting good farming practices. However, because it focuses on consumer health and safety regulations, it obscures how government affects and supports different farming practices. Communicators need strategies to broaden thinking about what government can do to support farmers and how sustainability can be factored into policymaking.

Thinking about Solutions

Participants' dominant cultural models greatly informed their thinking about what should be changed in the farming and food systems and how to change it. The link between how people understand an issue and how they perceive solutions to it is well documented in research by FrameWorks and other scholars in the social sciences. Below, we outline the solutions that emerged often in interviews, and we tease apart the thinking that participants drew on to generate and justify these solutions.

► **Solution 1: Increase or strengthen government regulations, especially around pesticides.**

Drawing on the *Government as Protector* model, participants often suggested that the government should more strictly regulate farming to make it safer and healthier. The *Chemicals Are Dirty* model led to a specific focus on pesticides, which people think are especially harmful to consumer health.

Participant: It needs to be regulated more. And it might be very difficult to do, but... because, you know, you buy pesticides, and who's going to really monitor how you use them? Unless there's a major problem, I don't think much is done, or could be done, you know?

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Participant: I guess they could put restrictions on the amount of the chemicals they use, like pesticides and fertilizer chemicals. Maybe they should have a minimum that they can use, to try to regulate that.

Implications for Communicators

1. **Support for regulations is a promising starting point.** It is promising that people easily attribute substantial responsibility to government. But this sense of responsibility is narrowly applied to protecting consumer health and safety and, even more narrowly, to restricting pesticides and other substances, which poses a challenge for communicators.

► **Solution 2: Consumers must educate themselves and make better decisions.**

When applying the *Consumerist* model and, to some extent, the *System Is Rigged* model, people often attribute primary responsibility for improving farming practices to consumers. If farmers simply pursue profit, and if the policymaking process is corrupted by industry influence, then consumer education and choice becomes the only viable solution to ensuring good farming practices or improving them.

Researcher: Do you see the public as responsible in any way?

Participant: Sure, I think the public is responsible, at least once it becomes aware. I think ignorance is bliss, but once you're not ignorant to it, it's on you.

Researcher: Do you think the public has a responsibility to become aware?

Participant: I think it's their responsibility. [...] We have to do whatever we can to educate people.

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Participant: I think people need to be educated more on what's really good and what's really bad versus what I see and what I do and don't want.

Implications for Communicators

1. **A focus on consumer choice and responsibility betrays an individualistic orientation.**

Consumer-oriented solutions are somewhat in line with experts' contention that raising public awareness is an essential part of ensuring that society can effectively meet the challenges of farming. However, members of the public think about this type of solution more individualistically, arguing that consumers must take responsibility to become educated and make different decisions about food. This draws attention away from the ways the farming system affects the choices and decisions that both consumers and farmers can make and the power of policies to change these contexts and alter farming practices.

► **Solution 3: Fund more scientific research to identify best practices, especially around pesticide use.**

Encouragingly, members of the public are fairly supportive of greater investment in the scientific study of farming. However, in most cases, this solution appeared to be motivated by the *Good Food = Healthy Food* and *Chemicals Are Dirty* models more than the *Scientific Control* model. This was made plain by the fact that most participants suggested conducting research on how farming practices—especially pesticide use—affect health rather than how they affect environmental and economic sustainability.

Researcher: So, you mentioned researchers, which I think is really interesting. How come?

Participant: Well, we need to be researching ways to prevent pests from bothering the crops in a way that won't harm human beings or animals or the farmer.

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Participant: I think a lot more government money should go into research of the insecticides and the genetic engineering and how they are affecting the public.

Implications for Communicators

1. **The public's recognition of the pivotal role of science in farming and food production provides a useful starting point for communicators.** However, communicators must expand and fill out the public's thinking about the many ways in which science can and does play a role in the development and dissemination of good farming practices.

▶ **Solution 4: Reduce the involvement and influence of industry in the policy-making process.**

The *System Is Rigged* model leads to the widespread assumption that big businesses, including large corporations in the farming and food industries, strongly influence government actions. Accordingly, some participants suggested that farming practices can only be improved by reforming the political system, and specifically by reducing the role of money in politics. Most participants, however, did not clearly articulate how to bring about reform.

Researcher: Are there any sort of steps we can take?

Participant: Well, you can't get any of that done without first getting money out of politics.

Implications for Communicators

1. **The desire for political reform is reasonable but may depress support for farming policy reform.** Although the public's concerns about the integrity of the political system are valid, they may lead people to conclude that farming policy reform is impossible without radical political reform. Communicators must carefully navigate this topic to avoid reinforcing fatalism.

▶ **Solution 5: There are no solutions.**

As we have noted, a number of cultural models contribute to an understanding that little can be done to overcome some of the challenges involved in farming. For example, if nature is uncontrollable, and government is corrupted by special interests, then it is difficult to envisage how society can improve farming or grasp the value of different interventions.

Participant: I don't know. I don't think change is ever going to happen because it's all controlled. People that are making money are going to keep making money, and it's going to stay that way.

Implications for Communicators

1. **Fatalism is a major hurdle.** If improving farming practices is seen as futile, then there is no reason for supporting systemic reforms. We recommend that future framing work focus on providing a more accurate and constructive way of thinking about the role of policy and scientific research in farming—what they do and what they are capable of doing to ensure a sustainable farming and food system.

▶ A Final Note on Sustainable Farming

At the end of each interview, participants were asked about their thoughts and understanding of the term “sustainable farming.” Responses revealed that most were unfamiliar with the phrase. Very few participants used the term “sustainable” and, when directly asked about sustainable farming at the end of their interviews, most said that they hadn’t heard of it. Those who had were unclear about its meaning.

Researcher: Have you heard of the term sustainable farming?

Participant: Sustainable farming. I have, but I don’t remember. Sustainable farming.

Researcher: Okay. What would be your guess of what it means?

Participant: Gosh. Sustainable farming.

Researcher: Do you have any image that comes to mind when you hear the phrase, maybe?

Participant: Hmm. Gosh. I am drawing a complete blank. I thought I’d heard of it, but probably only once.

Many who did define “sustainable farming” did not completely understand the term. Some defined it as farming that economically sustains farmers, some said it minimizes damage to the natural environment, and some said it sustains the health and survival of humans. But none defined it as more than one of these topics.

Researcher: What is sustainable farming?

Participant: Where the environment can continue to handle what you’re doing to it in the process of using it in order to produce things.

Researcher: Okay. What does it mean to “handle it”? You said, “The environment can handle what you’re doing.”

Participant: Oh, that you’re not destroying or altering the environment in a negative manner.

Some participants, meanwhile, incorrectly defined the term and expressed counterproductive understandings of it.

Participant: I know I’ve heard the word. I know “sustainable” is meaning that they can. It’s kind of like being at camp. [...] Yeah. Like, you’re living on a hill off the grid, and you’re getting everything you need. It’s kind of like that.

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Researcher: What do you think that [“sustainable farming”] would be?

Participant: Farming that you can continue doing, you got a hand on it, you can do it all the time and continuously get a good crop as the way you do it. They are able to continue to get a good crop.

Researcher: Can you say that last part again?

Participant: Okay. You are able to continue to get a good crop using the same method that you’ve been using all the time.

Implications for Communicators

1. **Communicators should not use the term “sustainability” without also explaining it.** The public lacks a clear grasp of the term, so communicators need to explain what it means and why it is necessary.

The Swamp of Farming

Taken together, the cultural models presented above comprise the “swamp” of public thinking about farming. This swamp depicts the implicit understandings and assumptions that become active when people think about this topic.

The Swamp of...
FARMING

- Farming and Nature**
 - *Natural Determinism*
 - *Scientific Control*
- Farmers**
 - *Hard Laborers*
 - *Loving and Ethical*
- Farming and Government**
 - *System Is Rigged*
 - *Protector of Health and Safety*
- Pest and Soil Management**
 - *Chemicals Are Dirty*
- Foundational Models**
 - *Good Food = Healthy Food*
 - *Natural vs. Human-Made*
 - *Threat of Modernity*
 - *Consumerism*
- Farming Practice**
 - *Farming as Craft*
 - *Farming as Formula*
 - *Farming as Trial and Error*
- Solutions**
 - *Toughen government regulations, especially around pesticides*
 - *Consumers educate themselves*
 - *Fund more research*
 - *Reduce industry influence in policymaking*
 - *Fatalism (The problem is too big to solve.)*

Mapping the Gaps: Key Communications Challenges

In this section, we identify the overlaps and gaps between expert and public perspectives and the communications challenges and opportunities that they present.

Overlaps

There are important points of overlap (or common ground) between expert and public understandings of farming. Communicators can use these overlaps as starting points to expand understanding of farming.

Both experts and the public understand that:

1. Farming is an integral part of society.
2. Farming practices affect human survival and health.
3. Farming is challenging and economically risky work.
4. Weather and climatic conditions are uncontrollable and affect farming.
5. Good farming practices are financially costly to adopt.
6. Organic and locally grown produce should be supported (although, notably, experts think of organic and local farming as only part of a broader category of sustainable farming).
7. Scientific research can and should inform the development of good farming and food practices.

Gaps

Analysis also uncovered gaps between expert and public understandings of farming, which reframing efforts should address to shift and expand public thinking about farming.

1. **Farming: Complex, expert practice vs. Hard but simple labor.** Experts see farming as a science that involves multiple complex decisions and demands a firm understanding of various skills and knowledge, including technology, biology, chemistry, ecology, economics, and business management. Members of the public see farming as challenging work, but generally think of it as a set of relatively simple tasks.
2. **Effects of Farming: Economic, environmental, and health vs. (Mostly) health.** Experts argue that farming affects society in various of areas, including the economy, the environment, and human survival and health. Members of the public recognize these different types of effects, but they prioritize and evaluate farming primarily in terms of its effects on human survival and health.

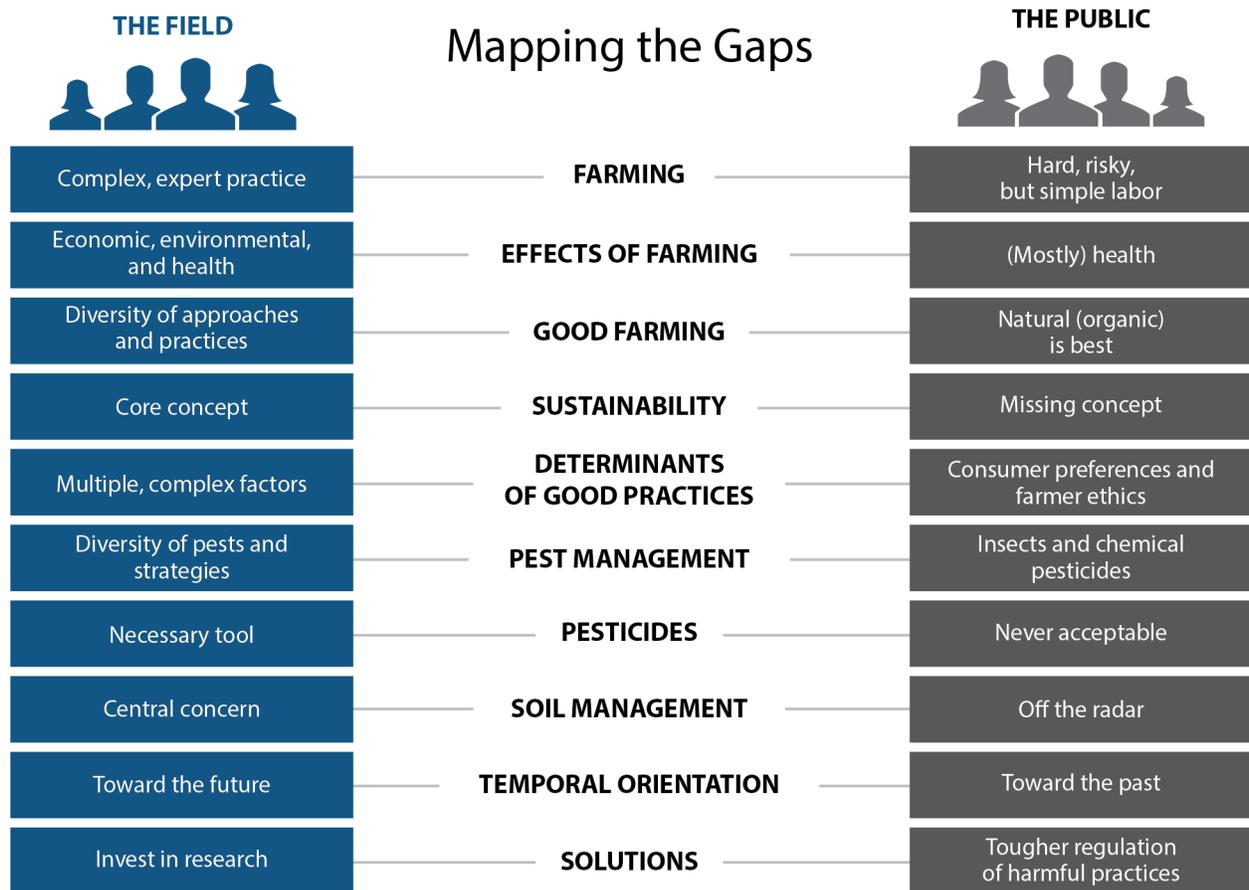
3. **Health Effects: Farmers, workers, and consumers vs. (Just) consumers.** Experts emphasize that farming practices affect the health and wellbeing of all people in society but that, in most cases, it most directly affects the health of farmers and farmworkers. Members of the public are much more focused on and concerned with how farming practices affect *consumer* health. They think much less about effects on the health of farmers or farmworkers.
4. **Good Farming: Diversity of approaches and practices vs. Natural (i.e., organic) is best.** Experts think good farming means drawing on an array of strategies and tools, including, but not limited to, organic methods. Members of the public, meanwhile, think good farming involves as little human intervention and as few human-made tools and substances as possible. Because they typically equate this approach with organic farming—albeit an inaccurate version of it—people tend to define good farming as organic farming.
5. **Sustainability: Core concept vs. Missing concept.** While experts argue that practices must be based on and evaluated along multiple dimensions of sustainability (i.e., economic, environmental, and social), this concept is, in the context of farming, largely unfamiliar to members of the public. In turn, the public does not apply a broad, consistent understanding of sustainability to evaluate farming practice.
6. **Determinants of Good Practices: Multiple, complex factors vs. Consumer preferences and farmer ethics.** Experts and members of the public similarly note economic and climatic constraints that farmers face. However, in thinking about what is needed to support good farming practices, experts emphasize the importance of financial, social, and, especially, scientific support, as these factors shape farming practice. The public, on the other hand, thinks that good farming practices mostly result from farmers who care about “doing the right thing” or shifts in consumer preferences. The broader range of determinants of farming practice are less visible to the public.
7. **Pest Management: Diversity of pests and strategies vs. Insects and chemical pesticides.** Experts note that pests come in a variety of forms and can be managed to an acceptable level through a variety of methods. When the public thinks about pest management, they think primarily about the elimination of insects with pesticides, which are typically assumed to be chemicals.
8. **Pesticides: Necessary tool vs. Never acceptable.** Experts argue that farmers do and must use pesticides of some kind, and whether and which methods are used to manage pests are largely questions of balancing what is financially tolerable with what is most environmentally and socially sustainable. The public, however, holds strong negative views about pesticides and believe that using pesticides to any degree is extremely harmful and toxic to human health.
9. **Soil Management: Central concern vs. Off the radar.** Experts note that soils, like pests, must be closely supervised and managed because they provide nutrients that plants need to grow. They also explained that there are various ways of ensuring healthy soil, including reducing tillage,

planting cover crops, rotating crops, and using fertilizers. While the public understands that healthy soil is important, their thinking is much more limited. Other than using animal waste and other fertilizers, they are not sure how soil health is, or can be maintained.

10. Temporal Orientation: Toward the future vs. Toward the past. Experts argue that innovation is key to ensuring good farming practices. They view farming as an ever-changing scientific practice that is informed by the past but adapted to the future. In contrast, the public often romanticizes farming from days past. They believe that we must turn back and mimic earlier practices and that organic, locally grown produce reflects such a turn.

11. Solutions: Investment in research vs. Tougher regulation of practices. In thinking about solutions, experts point out that much more knowledge is needed about farming practices in general and about specific topics, such as soil health, crop production, pest management, and the economics of farming. While the public also supports research, people are much more focused on pest management and, specifically, pesticides. Apart from research on the effects of pesticides, they believe there is a need to strengthen regulations on the use of pesticides and on food safety.

This graphic depicts the primary gaps between how experts and the public think about farming:



Initial Recommendations and Future Research

Building public understanding of farming is essential to ensuring sustainable farming and food systems. However, various aspects of public understanding profoundly limit society's ability to effectively meet this challenge. Members of the public tend to evaluate farming practices in terms of consumer health. They are much less well-versed in and concerned with the effects of farming on the natural environment and the health and wellbeing of farmers, and they assume that what is good for consumers is good for everything (and everybody) else. In addition, they tend to think in dichotomous terms about farming: "natural" and organic are good, anything else is bad; good farmers care about ethics, bad farmers care about only profits. They also tend to be fatalistic or narrow in their thinking about creating meaningful change and assume that consumer education and choices are the only path to good farming practices.

And yet, there are reasons to be optimistic. These less productive ways of thinking sit alongside more productive ones, which can be leveraged to expand and shift public thinking in more productive directions. All research participants understood farming as important, difficult work. They recognized that farmers are seriously constrained by economic and environmental factors, and that good farming practices are costly. And, perhaps most importantly, they were very interested in and attuned to thinking about farming and wanted to take steps to ensure society has access to an affordable, healthy, and environmentally friendly food supply.

The analysis of cultural models presented in this report yields an initial set of recommendations on how farming experts and advocates can communicate more effectively with the public. As noted below, more research is needed to understand which reframing strategies can best address the gaps above. Nevertheless, the following recommendations offer a provisional strategy that can be used now to inform communications practice.

► **Provide examples of how specific farming practices and interventions complement and work with nature.**

The public's strong assumption that natural or good farming means as little intervention into the natural environment as possible must be challenged and disrupted. Although public understanding of nature encourages support for some practices recommended by experts, it is too restrictive and prevents people from seeing that good farming is context-dependent and involves diverse approaches and tools. Communicators should help the public understand that no type of farming is completely natural or necessarily desirable.

▶ **Articulate the principles of sustainable agriculture rather than relying on the term to do the job.**

Members of the public still lack the language to define and describe the concept of sustainability, even though they support many of its features. Experts in farming recognize the term “sustainable farming,” but this shorthand phrase is less meaningful to members of the public. Communicators should speak in terms of the values or principles that underlie sustainability, such as environmental and economic stewardship, to help the public understand the approach they have in mind and why it is valuable.

▶ **Explain how certain farming practices enhance the natural environment.**

While people understand that farming affects the natural environment, they are typically more concerned about human health. What’s more, people understand this relationship in mostly negative terms; they think farmers must intervene in the environment as little as possible and avoid damaging it. To counter this belief, communicators should explain how some farming practices help maintain and restore the natural environment.

▶ **Highlight how farming practices affect farmers’ and farmworkers’ health and wellbeing.**

Farming is commonly understood as a business. As a result, when people think about the effects of farming on farmers and farmworkers, they focus on economic effects, such as employment, profits, and income. The public also recognizes that farming affects consumer health and, to a lesser extent, farmers’ and farmworkers’ health. Communicators can strengthen this understanding by highlighting and explaining these effects. And because the public values and admires farmers, calling attention to their health will likely generate the recognition that farming practices should take these effects into account.

▶ **Show what farmers do beyond planting seeds and harvesting and watering crops.**

People think of farming as difficult and exceptional work, yet they imagine it to be confined to very particular tasks and have trouble understanding exactly what farmers need to know and how they come to know it. Communicators should counter stereotypes of farmers as manual laborers with examples and illustrations of farming tasks that are less obvious to the public. This will help expand how the public thinks about the work of farming as well as the support and knowledge needed to be a farmer.

▶ **Explain how pesticides are used and explain why they are needed.**

Pesticides are at the center of public thinking about pest management, and people are concerned about their use. This is partly because they think of pesticides as chemicals, which are assumed to be toxic. Communicators must dislodge these associations and challenge public thinking about pesticides by offering examples of different ways that pesticides are used and that explain why they are used. One way to frame the need for pesticides is to remind people of the dangers that *pests* pose to human health.

► **Highlight how science funding supports good farming practices.**

Members of the public are receptive to the need for more scientific research on farming and food production. In addition, they understand that science can improve farming and develop farming practices that can help farmers deal with challenges, protect consumer health and safety, and minimize negative effects of farming on the natural environment. Communicators can leverage this understanding to generate further support for scientific research by offering positive examples of how scientific discoveries and innovations have improved farming over time.

These recommendations provide initial strategies that communicators can use to create more effective messages about farming. Further research is needed to identify communications tools and strategies capable of overcoming the deepest and most challenging gaps identified above. The following tasks comprise a prospective “to do list” for future framing research:

- **Broaden understanding of good farming practices beyond organic farming.** An important—or perhaps *the* most important—overarching task for communicators is to disrupt binary thinking about farming practices, and specifically the belief that methods that aren’t “natural” (i.e., organic) are bad for human health, or at least worse in some way. This way of thinking distorts understanding not only of conventional farming but also of organic farming, in both practice and principle. Communicators need ways of talking about farming practices that allow people to develop a more accurate, nuanced, and inclusive understanding of good farming.
- **Generate better understanding of how farming practices affect society, including consumer health.** As described throughout this report, when it comes to farming and food, the public overwhelmingly focuses on human health, and particularly consumer health. And, when thinking about health, people focus narrowly on pesticides. While consumer health concerns are important, people generally do not recognize the many other ways that farming affects society, and they also misunderstand how farming practices, including pesticide use, affect human health and wellbeing. A major task for future research is to identify strategies to broaden the public’s focus and fill in gaps in understanding of how farming practices affect not only consumers but also the environment, the economy, and farmers and farmworkers.
- **Generate better understanding of how pest management works and that pesticides are a necessary tool in pest management.** The public has a narrow understanding of both pests and pesticides and thinks mostly about insects and synthetic insecticides. This thinking undermines fuller understanding of what pest management is, how it works, and the role that pesticides play. Communications strategies are needed to widen public thinking and instill a more realistic, broader understanding of pest management.

- **Increase the salience and generate better understanding of soil management.** Members of the public see soil as something that needs to be managed; in other words, they know healthy soils do not just happen automatically. Nevertheless, people focus on soil management much less than pest management, and they are largely unaware of the various ways that soil can be managed and the extent to which we ought to be concerned about the current state of soil health. An important task for future research is to identify the most effective ways of increasing public knowledge of soil management and health and the importance attributed to it.
- **Expand understanding of why scientific research on farming practices is needed and in what areas.** Because members of the public are so concerned with pesticides, they believe that the primary focus of scientific research ought to be on developing alternatives. Meanwhile, the public tends to either ignore or place less emphasis on other issues and topics concerning experts and advocates. An important task for communications research is to develop reframing strategies that help the public see topics other than pesticides as important priorities for researchers and policymakers to address.
- **Build a sense of collective efficacy about society's ability to ensure good farming practices.** The public often assumes that we, as society, can do little to improve farming. This fatalism stems, in part, from the assumption that farming practices are driven by malicious profit-seeking and self-serving big businesses and political elites. Research is needed to find effective ways to counter fatalism and encourage optimism about our collective ability to ensure sustainable farming and food systems.

In subsequent research—which will include both qualitative and quantitative testing of frames—FrameWorks will develop an effective, comprehensive framing strategy capable of achieving these tasks. This work will culminate in a unifying narrative framework for those communicating with the public about farming.

This unifying narrative will require developing communications tools of varying types. Values will likely be needed to broaden the public's sense of why farming matters and to cultivate a sense of collective responsibility for improving farming. Explanatory metaphors and explanatory chains could help build public understanding of how farming happens, what makes for good farming practices, and the kinds of support that can enable farmers to make a living, provide a safe and healthy food supply into the foreseeable future, and strengthen the health of the natural environment. Exemplars may be useful in broadening the public's mental prototypes of pest management and good farming practices. Further research is needed to identify and test the effectiveness of these types of communications tools with the American public.

Conclusion

The cultural models findings presented in this report provide a map of the landscape that advocates and experts must navigate when communicating with the public about farming. By mapping the gaps between expert and public thinking, we have identified key areas where communicators must direct their focus and that future research must address.

While the public does have some very useful ways of thinking that communicators can tap into, there are also some potential pitfalls that communicators must avoid. Cultivating a fuller understanding of farming requires deepening the public's understanding of the different practices that farmers might use, why certain practices might be used over others, and these practices' effects—as well as the economic, environmental, and social dimensions of each of these aspects of the issue. This research suggests that deepening understanding in these ways is needed to generate support for a more sustainable, scientifically informed approach to farming and for creating programs and policies that can promote a farming and food production system that effectively meets the needs of everyone in society.

Communicators can use the initial set of recommendations presented here to begin to expand the public's understanding of farming. These recommendations seek to leverage the more productive public perspectives on farming and to divert thinking away from less productive ones. Future research will develop a more specific and comprehensive reframing strategy capable of overcoming the challenges identified in this report.

Appendix: Research Methods and Sampling Information

Expert Interviews

To explore expert knowledge of farming, FrameWorks conducted 12 one-on-one, one-hour phone interviews with participants whose expertise included research, practice, and policy. Interviews were conducted in December 2016 and, with participants' permission, were recorded and transcribed for analysis. FrameWorks compiled the list of interviewees, who reflected a diversity of perspectives and areas of expertise, in collaboration with Red Tomato, a nonprofit organization in Massachusetts that is working to create a more sustainable food system, and that is leading the Farming and Food Narrative Project.

Expert interviews consisted of a series of probing questions designed to capture expert understandings about what farming is and what it involves; what the consequences of farming practices are; what makes for good farming practices; and what can be done to better support the use of good farming practices. In each interview, researchers used a series of prompts and hypothetical scenarios to challenge experts to explain their research, experience and perspectives, break down complicated relationships, and simplify complex concepts. Interviews were semi-structured in the sense that, in addition to pre-set questions, researchers repeatedly asked for elaboration and clarification and encouraged experts to expand on concepts they identified as particularly important.

Analysis used a basic grounded theory approach.¹⁶ This means that researchers identified and inductively categorized common themes that emerged in each interview and across the sample. They also incorporated themes that appeared to contradict one another into the overall findings within each theme. This procedure resulted in a refined set of themes, which researchers supplemented with a review of materials from relevant literature.

Cultural Models Interviews

The goal of this research was to capture the various, commonly held assumptions, or cultural models, that Americans use to make sense of farming and food production and of issues related to these topics. To accomplish this, FrameWorks conducted 24 in-depth interviews with members of the American public in California (Santa Ynez and the Los Angeles metropolitan area), Illinois (Jacksonville, Freeport, and the Chicago metropolitan area), Georgia (Eatonton, Summerville, and the Atlanta metropolitan area), and Maryland (the Baltimore metropolitan area) from June to July 2018.

Interviews were one-on-one, semi-structured conversations that lasted approximately two hours. All interviews were recorded and transcribed, with participants' written consent. Interviews consisted of open-ended questions about topics and issues related to farming and food production, with researchers

probing and relying on participants to explain or make connections in their thinking. Interviews covered participants' thinking about farming in broad terms before focusing specifically on their thoughts about good farming practices and ways to support them. Interviews touched on participants' thoughts about what farming involves, why and how farmers decide to use certain practices, what effects farming practices have on society, who is responsible for farming and farming practices, and whether and how current farming practices might be improved, as well as several more specific topics or practices, such as pest and soil management, pesticides and fertilizers, and the use of technology in farming. Researchers approached each interview with this set of topics to cover but allowed participants to determine the direction and nature of the discussion about each topic.

Table 1 illustrates the demographics of the participant sample. As it shows, the sample included 13 women and 11 men. Of the 24 participants, 11 self-identified as 'white', 10 as Black or African-American, two as Hispanic or Latino/a, and one as "other race or ethnicity." Five participants described their political views as "liberal or left-leaning," six as "conservative or right-leaning," and 13 as "middle of the road or moderate." Six were recruited from locations in non-metropolitan counties and reported living in rural areas, and 18 were recruited from metropolitan counties, eight of which were from urban areas and 10 from suburban areas. The mean age of the sample was 43.1 years. Two participants held a high school diploma or less (or equivalent), 13 had some college education, four held bachelor's degrees, and five held graduate or professional degrees of some kind. Three had incomes of \$25,000 or less, five had incomes between \$25,000 and \$49,999, nine had incomes between \$50,000 and \$99,999, and seven had incomes of \$100,000 or above. Eleven were married/living as married, and 15 were parents of at least one child.

In-depth, semi-structured interviews with a small, diverse group of individuals are well suited to this type of research and commonly used across the social sciences to identify and describe patterns of thinking among broad populations—in this case, the US population. Researchers use open-ended interviews and rely on participants to guide discussions so they can explore and identify *how* people think. Interviews that pursue a pre-determined, limited set of topics and issues yield data that indicate *what* people think. In-depth, semi-structured interviews, by contrast, yield data that explain *why* people think certain things; they produce insights on all of the possible ways that people think about an issue. Thus, this method reveals deeper patterns in thinking that other types of research methods, such as large-scale quantitative surveys, can't produce.

The smaller size and the demographics of the sample are also well suited to this type of research. This research does not provide information about, nor does it draw any conclusions about, how many or which groups of Americans hold specific beliefs or support different policies, nor does it identify whether and what kinds of differences in understandings exist between different demographic or political groups (which would be an inappropriate use of this method and its sampling frame). In contrast, this research aims to characterize the different ways of thinking about farming and food production that are available to Americans and that exist *across* or *despite* potentially significant demographic differences. A small, but highly diverse sample is, thus, necessary and appropriate for these purposes.

Table 1: Participant Demographics

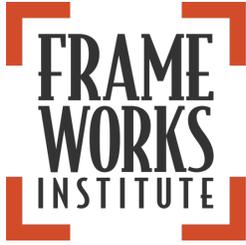
Demographic	Number of Participants	Percentage (%) of Participants (n=24)
Age (Mean: 43.1; Range: 24-63)		
18-29	5	21
30-39	6	25
40-49	5	21
50-59	4	17
60-69	4	17
Sex		
Female	13	54
Male	11	46
Annual household income		
Less than \$25,000	3	13
\$25,000-\$49,999	5	21
\$50,000-\$99,999	9	38
\$100,000, or above	7	29
Education		
High school diploma or less	2	8
Some college education	15	54
Bachelor's degree	4	17
Graduate or professional degree	5	21
Race and ethnicity		
Black or African-American	10	42
Hispanic or Latino/a	2	8
White	11	46
Other person of color	1	4
Political ideology		
Conservative	6	25
Liberal	5	21

Moderate, or "middle of the road"	13	54
State of residence		
California	6	25
Georgia	6	25
Illinois	6	25
Maryland	6	25
Type of geographic residence/identity¹⁷		
Rural	6	25
Suburban	10	42
Urban	8	33
Marital status		
Married or living as married	11	46
Single or unmarried	13	54
Parental status		
Have children	15	65
Don't have children	9	35

About the Farming and Food Narrative Project

The Farming and Food Narrative Project is a collaborative partnership involving agricultural scientists, social scientists, farmers, and farming advocates—an interdisciplinary, cross-sector mix dedicated to working with and harmonizing the many voices communicating about agriculture and food today. The founding partnership organizations include the FrameWorks Institute; IPM Voice, a nonprofit organization that advocates for ecological farming and IPM; and Red Tomato, a nonprofit food hub. The team also includes Farm Aid, a national nonprofit organization promoting the arts in support of the family farm movement.

This project is guided by a team of advisors who have provided critical input and insight, including Katherine DiMatteo, Wolf, DiMatteo + Associates; David Epstein, Office of Pest Management Policy, United States Department of Agriculture; Sue Futrell, Red Tomato; Larry Gut, Michigan State University; Carolyn Mugar, Farm Aid; Samina Raja, Urban and Regional Planning, University of Buffalo; Anu Rangarajan, Cornell Small Farms Program, Cornell University; Michael Rozyne, Red Tomato; Julie Sweetland, FrameWorks Institute; Glenda Yoder, Farm Aid; Jerry J. Baron, IR-4 Project; Jim Farrar, Statewide IPM program, University of California, Davis; Tom Green, IPM Institute of North America; Jim Koan, Almar Orchards; and Keith Pitts, Marrone Bio Innovations.



About the FrameWorks Institute

The FrameWorks Institute is a nonprofit think tank that advances the nonprofit sector’s communications capacity by framing the public discourse about social problems. Its work is based on Strategic Frame Analysis®, a multi-method, multidisciplinary approach to empirical research. FrameWorks designs, conducts, publishes, explains, and applies communications research to prepare nonprofit organizations to expand their constituency base, to build public will, and to further public understanding of specific social issues—the environment, government, race, children’s issues, and health care, among others. Its work is unique in its breadth—ranging from qualitative, quantitative, and experimental research to applied communications toolkits, eWorkshops, advertising campaigns, FrameChecks®, and in-depth FrameLab study engagements. In 2015, it was named one of nine organizations worldwide to receive the MacArthur Foundation’s Award for Creative and Effective Institutions. Learn more at www.frameworksinstitute.org.

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Endnotes

- ¹ On the significance of farming to American culture and politics, please see Hofstadter, R. (1956, April). The myth of the happy yeoman. *American Heritage*, 7 (3). Retrieved from: <https://www.americanheritage.com/content/myth-happy-yeoman>
- ² According to recent figures, 1.5 percent of the US population is employed in agriculture. See Employment Projections Program. (2017). *Employment by major industry sector. Table 2.1: Employment by major industry sector, 2006, 2016, and projected 2026*. Washington, DC: US Bureau of Labor Statistics. Retrieved from: <https://www.bls.gov/emp/tables/employment-by-major-industry-sector.htm>.
- ³ See, for example: Johns Hopkins Center For a Livable Future. (2018, July). *Survey: Nearly two-thirds of Americans oppose cuts to SNAP program*. Baltimore, MD: Johns Hopkins Center For a Livable Future. Retrieved from: <https://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-a-livable-future/news-room/News-Releases/2018/survey-nearly-two-thirds-of-americans-oppose-cuts-to-snap-program.html>. Pew Research Center. (2016, December). *The new food fights: US public divides over food science*. Washington, DC: Pew Research Center. Retrieved from: <http://www.pewinternet.org/2016/12/01/the-new-food-fights/>.
- ⁴ This project has been supported with funding from the North Central IPM Center, Southern IPM Center, Northeastern IPM Center, Town Creek Foundation, Cedar Tree Foundation, Prince Charitable Trust, Michigan State Horticultural Society, Whole Foods Markets, Marrone Bio Innovations, IR-4 Project, Red Tomato, IPM Institute of North America, NEWSAWG—the Northeast Sustainable Agriculture Working Group, the Chesapeake Foodshed Network, and several other anonymous individuals.
- ⁵ Quinn, N. & Holland, D. (1987). Culture and cognition. In D. Holland & N. Quinn (Eds.): *Cultural models in language and thought* (pp.3-40). Cambridge: Cambridge University Press.
- ⁶ National Agricultural Statistics Service. (2016, September). *2012 census of agriculture highlights. Small farms*. (2016, September). Washington, DC: US Department of Agriculture. Retrieved from: <https://www.nass.usda.gov/Publications/Highlights/2016/SmallFamilyFarms.pdf>.
- ⁷ For discussions of this model in different contexts, see Lindland, E., Fond, M., Haydon, A., & Kendall-Taylor, N. (2015). “Nature doesn’t pay my bills:” *Mapping the gaps between expert and public understandings of urban nature and health*. Washington, DC: FrameWorks Institute; Davis, C., L’Hôte, E., Volmert, A., & Sweetland, J. (2018). *Can’t quit now: Mapping the gaps between field and public understandings of tobacco-related health disparities in the United States*. Washington, DC: FrameWorks Institute.
- ⁸ This model also has biblical roots (sin as the perversion of the pure, natural state in the Garden of Eden) and has a long history that can be traced through certain Enlightenment depictions (e.g., Rousseau’s) of the state of nature.
- ⁹ All participant interview excerpts were edited to remove personally identifying information and to improve readability. To conduct the analysis, researchers worked from verbatim transcripts of the interviews.
- ¹⁰ FrameWorks’ research has documented a prevailing notion among members of the public that modernization, in general, is fairly extreme. While people assume modernization is an inevitable and necessary byproduct of human growth and development, they tend to associate it with several negative outcomes, such as increased stress, exposure to environmental toxins, social isolation, and job loss and, thus, feel highly ambivalent about the concept. See Lindland, E., Volmert, A., Haydon, A., & Ford, A. (2014). *Everyone’s young or old...: Mapping the gaps between expert and public understandings of demographic change in the US*. Washington, DC: FrameWorks Institute; Lindland, E., Fond, M., Haydon, A., & Kendall-Taylor, N. (2015). *Nature doesn’t pay my bills: Mapping the gaps between expert and public understandings of urban nature and health*. Washington, DC: FrameWorks Institute.

- ¹¹ This is consistent with FrameWorks' earlier research on public thinking about food systems in the United States. See Aubrun, A., Brown, A., & Grady, J. (2005). *Not while I'm eating: How and why Americans don't think about food systems*. Washington, DC: FrameWorks Institute; Bostrom, M. (2006). *The food chain: Linking private plate to public process. An analysis of qualitative research exploring perceptions of the food system*. Washington, DC: FrameWorks Institute. FrameWorks has found that members of the public apply a consumerist lens when thinking about other topics and issues as well, such as housing and health care. See Baran, M., Kendall-Taylor, N., Haydon, A., & Volmert, A. (2016). *A house, a tent, a box: Mapping the gaps between expert and public understandings of health housing*. Washington, DC: FrameWorks Institute; Fond, M., Volmert, A., Levay, K., L'Hôte, E., & Kendall-Taylor, N. (2018). *Safety is more than caring: Mapping the gaps between expert, public, and health care professional understandings of patient safety*. Washington, DC: FrameWorks Institute.
- ¹² FrameWorks' research on climate change has observed similar thinking about nature. See Volmert, A., Baran, M., Kendall-Taylor, N., Lindland, E., Haydon, A., Arvizu, S., & Buntin, A. (2013). *Just the Earth doing its own thing: Mapping the gaps between expert and public understandings of oceans and climate change*. Washington, DC: FrameWorks Institute.
- ¹³ For example, in a recent survey, 62 percent of Americans said that science has had a mostly positive effect on food quality and safety. See Pew Research Center. (2015, January 29). *Public and scientists' views on science and society*. Washington, DC: Pew Research Center. For more on public thinking about science also see Volmert, A., Baran, M., Kendall-Taylor, N., & O'Neil, M. (2013). *You have to have the basics down really well: Mapping the gaps between expert and public understandings of STEM learning*. Washington, DC: FrameWorks Institute. Volmert, A., Baran, M., Kendall-Taylor, N., Lindland, E., Haydon, A., Arvizu, S., & Buntin, A. (2013). *Just the Earth doing its own thing: Mapping the gaps between expert and public understandings of oceans and climate change*. Washington, DC: FrameWorks Institute.
- ¹⁴ FrameWorks' research on environmental health has similarly found that people tend to think of chemical contamination of the natural environment as the primary mechanism by which environmental health (negatively) affects human health. See Lindland, E., & Kendall-Taylor, N. (2011). *People, polar bears, and the potato salad: Mapping the gaps between expert and public understandings of environmental health*. Washington, DC: FrameWorks Institute.
- ¹⁵ See Bostrom, M. (2005). *Without a mission: An analysis of qualitative research exploring perceptions of government*. Washington, DC: FrameWorks Institute; Fond, M., Volmert, A., Levay, K., L'Hôte, E., & Kendall-Taylor, N. (2018). *Safety is more than caring: Mapping the gaps between expert, public, and health care professional understandings of patient safety*. Washington, DC: FrameWorks Institute; Lindland, E., & Kendall-Taylor, N. (2011). *People, polar bears, and the potato salad: Mapping the gaps between expert and public understandings of environmental health*. Washington, DC: FrameWorks Institute.
- ¹⁶ Glaser, B. & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research (observations)*. Chicago: Aldine; Strauss, A. & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage.
- ¹⁷ Participants classified as rural resided in non-metropolitan counties as defined by the USDA Economic Research Service and personally identified as residing in rural areas. Participants classified as suburban or urban resided in metropolitan counties as defined by the USDA Economic Research Service, and personally identified as living in suburban or urban areas.