June 21, 2021

Secretary Tom Vilsack
Seth Meyer, Chief Economist
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Room 2055-S, STOP 0201
U.S. Department of Agriculture
1400 Independence Ave., S.W.
Washington, DC 20250

Via regulations.gov

Re: Docket Number: AMS–TM– 21–0034 – Earthjustice and NRDC's Comments on Supply Chains for the Production of Agricultural Commodities and Food Products

Secretary Vilsack:

Earthjustice and the Natural Resources Defense Council (NRDC) respectfully submit these comments in response to USDA's request for comments, Docket Number AMS-TM-21-0034, Notice on Supply Chains for the Production of Agricultural Commodities and Food Products, 86 Fed. Reg. 20652 (Apr. 21, 2021). We appreciate the opportunity to provide recommendations on ways the USDA can secure and strengthen the supply chain in the food and agricultural sectors.

Earthjustice is a nonprofit public interest environmental law organization that works in partnership to protect public health, preserve magnificent places and wildlife, to advance clean energy, and to combat climate change. NRDC works on behalf of its three million members to safeguard the Earth – its people, its plants, its animals, and the natural systems on which life depends. Earthjustice and NRDC understand that our current agricultural system threatens our environment and health, but also has great potential to protect our climate, enhance biodiversity, and build healthier communities.

We strongly support the Biden-Harris Administration's Build Back Better Plan and the USDA's recently announced plans to invest more than $4 billion to strengthen food and farming supply chains. The USDA's recognition that our country's rigid, consolidated, and often fragile supply chains leave Americans vulnerable to climate change and other stressors is an important step toward redesigning for resilience, decentralization, and flexibility.

We are also pleased to see that equity in the food system continues to be a priority for the Administration. For far too long, food insecurity has left millions of Americans—including those in Tribal communities—unable to access the nourishment they need. Since the start of the COVID-19 pandemic, Latino and Black households are twice as likely to report being food insecure as white households.[1] Meanwhile, farmworkers—a predominantly Latino and immigrant workforce—face threats to their health and well-being every day due to exposure to pesticides and the impacts of climate change.[2]

The following comments highlight specific, near-term opportunities for the USDA as it invests in a more just, healthy, resilient, and sustainable food and farming system. At a macro level, to ensure secure, climate-resilient and reliable supply chains in the food and agriculture sector, the USDA must integrate the following seven overarching priorities into policy:

1. **Building resilient food systems**. As extreme weather and public health crises become more common, supply chains that are nimble and climate-friendly will be even more key to ensuring food security. Shorter supply chains will also help support local economic development.

2. **Ensuring the availability of clean water.** Clean water is a critical good that needs to be protected and preserved. Polluting practices associated with conventional agriculture threaten the availability of clean water, while a shift towards climate-smart practices improves water quality and, as a result, the resilience of the agriculture sector.

3. **Ending reliance on fossil-fuel based fertilizers and pesticides**. Use of synthetic fertilizers and pesticides can interfere with long-term soil health and fertility and threaten food production. These chemical inputs also limit carbon sequestration, and harm human and ecosystem health.

4. **Centering racial equity across all USDA food and farming programs. The** USDA must lead with a commitment to equity and center the needs of farmers of color, farming communities, neighboring communities, and workers who have been harmed by rigid, consolidated, and extractive supply chains.

5. **Ensuring nutritious food gets to everyone's plate**. While nutrition insecurity could increase as the planet warms, climate-smart supply chain policies that support local and regional production of sustainably-produced grains, specialty crops (fruits and vegetables), and livestock across the country can ensure that communities are able to feed themselves.[3]

6. **Developing integrated solutions across the food system.** Siloed approaches to a complex food system create supply chains that primarily benefit large, powerful corporate actors and leave many other entities and people exploited or forgotten. Strategic investments in our food system's workforce, natural and built infrastructure, climate resilient farms and ranches, regional food infrastructure, healthy food access,

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[1] *See* Marlysa D. Gamblin & Kathleen King, *Racially Equitable Responses to Hunger During COVID-19 and Beyond*, (Jan. 14, 2021), https://www.bread.org/library/racially-equitable-responses-hunger-during-covid-19-and-beyond.

[2] *See* Lena Brook & Juanita Constible, *Treat Farmworkers as Essential, Not* Sacrificial, NRDC (Sept. 12, 2020), https://www.nrdc.org/experts/lena-brook/treat-farmworkers-essential-not-sacrificial.

[3] *See, e.g.*, Food & Agric. Org. of the U.N. et al., *The State of Food Security and Nutrition in the World 2020* (2020).

Tribal nations, and historically underserved communities will help build and sustain agricultural economies, while increasing overall resilience.

7. **Using true cost accounting principles.** To comprehensively assess the impact of our food system on people, ecosystems, and the environment, *all* externalities must be taken into account when evaluating policy proposals, including land use impacts associated with agriculture. True cost accounting (also known as full cost accounting) principles should inform USDA decision-making to ensure that the value of sustainable, climate-friendly, organic, and regenerative food production practices is accurately reflected.[4]

In all cases, we urge USDA to prioritize projects that leverage private, federal, and local funding, produce the greatest public benefit, or create the greatest prioritization for supply chain projects that offer multiple health, economic, social, and environmental benefits. Additionally, we urge USDA to dedicate significant resources to ensuring that grants are accessible, flexible, and minimize barriers to participation. This includes:

- Accelerating the transition *toward* climate-friendly agricultural practices like certified organic farming (or farms in transition to organic certification) and other climate-smart practices that offer a multitude of public health, biodiversity, economic and climate benefits.
- Accelerating the transition *away* from synthetic pesticides and fertilizers that degrade soil, air, and water quality, disproportionately harm farmworker communities and communities adjacent to farmland, and threaten pollinator populations.
- Supporting the needs expressed by, and leveraging the expertise of, community-based organizations, coalitions, and the constituencies they represent.
- Investing in holistic community development efforts, especially in disadvantaged communities, that simultaneously promote public health, environmental stewardship, climate resiliency, social services, and job creation.
- Supporting socially disadvantaged farmers or ranchers, especially producers of color and small- and mid-sized farmers and ranchers.
- Building partnerships between community-based and other nonprofit organizations, Tribal governments, research institutions, and local governments to support economic development and climate resilience.
- Supporting the formation and continued success of cooperatively owned and operated food and agriculture businesses in historically underserved communities.
- Addressing the needs of historically underserved communities, including the needs of socially disadvantaged farmers or ranchers, disadvantaged communities, and food system workers.
- Supporting the health, safety, and financial security of the food and agriculture workforce.
- Eliminating food insecurity and increasing access to healthy food.

[4] *See, e.g.*, *Full-cost Accounting*, Food & Agric. Org. of the U.N., http://www.fao.org/nr/sustainability/full-cost-accounting/en/ (last visited June 16, 2021).

- Acknowledging and protecting Indigenous knowledge and expertise to build more just, equitable, and resilient tribally led food and farming systems.
- Eliminating inequities in land ownership and access, protecting farmland, facilitating land tenure, and supporting farm viability and transition.

To address climate resilience, help vulnerable communities, and strengthen local and regional food economies, we provide important background information and recommend several comprehensive policy approaches below with reference to the elements identified in the request for comments.

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1. **Critical goods and materials underlying agricultural and food product supply chains.**

President Biden's Executive Order on America's Supply Chains requires USDA to assess risks to, and identify investments needed to protect "critical goods and materials," which are defined as, "goods and raw materials currently defined under statute or regulation as 'critical' materials, technologies, or infrastructure." Exec. Order No. 14017, 86 Fed. Reg. 11849, 11851, 11853 (Feb. 24, 2021). The Critical Infrastructures Protection Act of 2001 (CIPA) defines "critical infrastructure" (CI) as "systems and assets, whether physical or virtual, so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security, national economic security, national public health or safety, or any combination of those matters."[5] The Defense Production Act of 1950 provides a materially similar definition.[6] The following goods and materials should be considered critical to the food and agricultural sectors:

A. Water is Critical.

Under both CIPA and the Defense Production Act, water is considered CI.[7] This is clearly so in the agricultural sector, as clean and plentiful water is critical to raising crops and livestock. Agriculture accounts for over 80% of consumptive water use in the U.S.[8] In 2015, irrigation in the U.S. was responsible for 42% of total freshwater withdrawals, and over half of this use was concentrated in just five states with large agricultural irrigation footprints — California, Idaho, Arkansas, Montana, and Colorado.[9] Livestock and aquaculture also account for additional agricultural water consumption outside of cropland irrigation. Agricultural activities not only consume water resources, but also have the potential to impact water quality through runoff of nutrients, pesticides, and animal waste. Thus, it is critical to address the risks agriculture poses to both water quantity and water quality through more sustainable practices to best protect this critical input.

B. Energy, but not Biofuels, is Critical.

CIPA and the Defense Production Act also define energy as CI. USDA's Rural Energy for America Program (REAP), Rural Development's Rural Utilities Service, and the Rural Energy Savings Program (RESP), promote energy grid resilience by supporting energy efficiency and renewable energy projects.

However, accepting energy as a critical input does not also require designating biofuels as critical. Rather, before promoting biofuels and biofuel infrastructure as critical inputs, USDA must first consider the tradeoff between the benefits and costs inherent in biofuel production. Notably, increased use of renewable fuel must necessarily be accompanied by increased production of renewable biomass to make that fuel. This biomass primarily takes the form of

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[5] 42 U.S.C.A. § 5195c(e).
[6] *See* 50 U.S.C. § 4502.
[7] *See* 42 U.S.C.A § 5195c(b)(2).
[8] *See Irrigation & Water Use*, U.S. Dep't Agric., https://www.ers.usda.gov/topics/farm-practices-management/irrigation-water-use/ (last updated Sept. 23, 2019).
[9] U.S. Geological Survey, *Estimated Use of Water in the United States in 2015*, 27 (2018) , https://pubs.usgs.gov/circ/1441/circ1441.pdf.

corn for ethanol and soy for biodiesel. The progression of the Renewable Fuel Standard (RFS) program illustrates this nexus: as volumes of renewable fuel requirements have steadily increased over time, so too has cultivation of corn and soy.[10] Between 2007 (when the statute mandating a renewable fuel requirement was passed) and 2016, planted corn increased by nearly 10 million acres, while planted soybeans increased by roughly 7-13 million acres.[11]

To satisfy the need for increased acres to grow renewable biomass, farmers have converted millions of acres of land that previously was not in cultivation. According to EPA, there has been "an increase in actively managed cropland by roughly 4-7.8 million acres" since the implementation of the RFS program.[12] "These changes are reported to be coming mostly from lands that were formerly in grassland for 20 or more years, and going to corn, soy, and wheat,"[13] and "[t]here is strong correlational evidence that biofuels are responsible for some of this observed land use change."[14] Indeed, "[t]he first crop planted on converted land was dominated by corn (27%)," with soybeans close behind (20%).[15]

Thus, using EPA's RFS program as an example, should USDA use its policies, funding, and other authorities to encourage greater adoption of biofuels for transportation, it will trigger increased production of renewable biomass. Unless USDA imposes certain restrictions on what land can be used for renewable biomass production, this in turn will lead to increasing levels of land conversion to grow the necessary feedstock, which in turn will result in myriad environmental and climate harms, including threats to essential goods and materials such as soil health and pollinators. Conversion of this land to produce crops exposes the stored carbon to decomposition, creating a tremendous quantity of carbon dioxide that is released into the atmosphere.[16] In addition to CO2, land conversion also releases vast quantities of nitrous oxide (N2O), a GHG that is approximately 300 times more potent than CO2.[17] Newly cultivated cropland—in particular, land used to grow corn—requires increased nitrogen fertilization, only 40-50% of which is absorbed by the crops. The excess nitrogen either runs off with surface water, leaches into ground water, or is converted by microorganisms into N2O which is then released into the atmosphere.[18] Additionally, many small scale farmers with small acreage are unable to compete and grow renewable biomass and thus are pressured into selling their parcels of farmland to large growers intent on capitalizing on the demand for biofuels, offering cheap land prices to largely Black farmers so they can buy and then convert that land into corn and soy for biofuels.

In addition, "standard methods for evaluating the effect of land use on greenhouse gas emissions systematically underestimate the opportunity of land to store carbon if it is not used

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[10] *See* EPA, *Biofuels and the Environment: Second Triennial Report to Congress* at 11 (June 2018) ("Triennial Report")(Attached as Ex. 1).
[11] *Id*.
[12] *Id*. at 37 (emphasis added).
[13] *Id*. at 38.
[14] *Id*. at 44.
[15] *Id*. at 34.
[16] *See* Decl. of Dr. Tyler Lark, ("Lark Decl.")(Attached as Ex. 2), ¶ 36.
[17] *See* EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2018*, 1-10 tbls. 1, 2 & 3 (2020), https://www.epa.gov/sites/production/files/2020-04/documents/us-ghg-inventory-2020-main-text.pdf.
[18] *See* Triennial Report at 70.

for agriculture."[19] Phrased differently, "typical lifecycle assessments [], which estimate the GHG costs of a food's consumption, only estimate land-use demands in hectares without translating them into carbon costs. Other [life cycle assessments] consider land use carbon costs only if a food is directly produced by clearing new land …."[20] A more accurate and complete approach is to add to the production-related GHG emissions the "quantity of carbon that could be sequestered annually if [that land] were instead devoted to regenerating forest [or grassland]."[21] Adding these climate change impacts to the renewable biomass production emissions would very dramatically increase its true climate change footprint.[22]

Given that land is a fixed commodity—62% of which is used for agriculture in the continental United States—USDA must consider the tradeoffs involved in using land for biomass production rather than having it used for some other purpose. Specifically, if an acre of land is being used to produce renewable biomass, it is not being used to store or sequester carbon (in the form of uncultivated grassland or forest, for example,) nor is it being used to produce crops used to feed people.

C. Food is Critical.

The Federal Government has also designated food and agriculture as CI. For example, the U.S. Department of Homeland Security's 2013 National Infrastructure Protection Plan (NIPP) deems Food & Agriculture to be a CI sector.[23] And FSA has stressed that "[f]ood is a critical commodity essential to the national defense."[24]

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[19] Timothy D. Searchinger et al., *Assessing the Efficiency of Changes in Land Use for Mitigating Climate Change*, 564 Nat. 249, 249 (2018); *see also* Matthew N. Hayek et al., *The Carbon Opportunity Cost of Animal-Sourced Food Production on Land*, 4 Nat. Sustainability 21 (2021).
[20] Searchinger et al., at 249.
[21] *Id.* at 250.
[22] *Id.*
[23] *See* U.S. Dep't of Homeland Sec., National Infrastructure Protection Plan (NIPP) *2013: Partnering for Critical Infrastructure Security and Resilience* at 11 (2013).
[24] Agriculture Priorities and Allocations System, 80 Fed. Reg. 63,890-01, 63,890 (Oct. 22, 2015). Under the Defense Production Act of 1950, the USDA has jurisdiction over the following materials and services as they relate to national defense, including emergency preparedness and protecting key resources: (1) "[F]ood resources (including potable water packaged in commercially marketable containers) [and] food resource facilities"; (2) "[L]ivestock resources, veterinary resources, [and] plant health resources"; and (3) "[D]omestic distribution of farm equipment and commercial fertilizer." *Id*. at 63891. The USDA has delegated authority to the Farm Service Agency (FSA) to implement the Agricultural Priorities and Allocation System (APAS), under which there are three approved programs:

> Items or services for which the USDA may provide priorities or allocations support must fall under one of the following programs:
> (1) Food and food resources (civilian): Programs involving food and food resources processing and storage in support of emergency preparedness activities conducted pursuant to Title VI of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act, 42 U.S.C. 5195–5197h).
> (2) Agriculture and food critical infrastructure protection and restoration (civilian): Programs to protect or restore the agriculture and food system from terrorist attacks, major disasters, and other emergencies.
> (3) Military food rations: Programs to provide the Department of Defense with food resources for combat rations.

Id.

The federal government recognizes the risks climate change poses to food and agriculture CI. For instance, President Obama noted in a 2016 memorandum that drought, an issue exacerbated by climate change, "jeopardizes the integrity of critical infrastructure, causes extensive economic and health impacts, harms ecosystems, and increases energy costs."[25] The U.S. Department of Homeland Security recognizes the impacts of drought on the food and agriculture sector specifically, including reduced crop yields and farmer wages, as well as environmental disruptions like wind erosion of soil.[26] These policies suggest that not only sufficient crops, but also livable farmworker wages and healthy soil, are critical to the food and agriculture sector.

D. Additional Critical Goods and Materials

Beyond the officially recognized CI sectors of water, energy, food, and agriculture, the breadth of CI now encompasses a wide array of systems and assets, including those that may become critical in emergencies even if not statutorily defined as CI.[27] Thus, in the emergency of a climate-change-induced natural disaster, the USDA may treat certain agricultural assets as critical even if they are not defined as such. The federal government already recognizes the risks climate change poses to such undefined CI. For instance, President Obama noted in a 2016 memorandum that drought, an issue exacerbated by climate change, "jeopardizes the integrity of critical infrastructure, causes extensive economic and health impacts, harms ecosystems, and increases energy costs."[28] The U.S. Department of Homeland Security recognizes the impacts of drought on the food and agriculture sector specifically, including reduced crop yields and farmer wages, as well as environmental disruptions like wind erosion of soil.[29] These policies suggest that not only sufficient crops, but also livable farmworker wages and healthy soil, are critical to the food and agriculture sector. Given the real but unpredictable threat climate change poses to the food supply chain, the USDA should be prepared to treat support for agricultural workers, pollinators, and soil health as critical— though such support is not statutorily defined as critical—— —to better ensure a climate change-resilient food system.

2. Other essential goods and materials underlying agricultural and food product supply chains.

If not critical, support for farm and food workers—their health, economic stability, and safety—is essential to a reliable and successful food and agriculture sector. Other essential elements of a healthy and sustainable supply chain include healthy soils that make farms resilient

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[25] Building National Capabilities for Long-Term Drought Resilience, 81 Fed. Reg. 16,053, 16,053 (Mar. 21, 2016).
[26] Operational Analysis Div., U.S. Dep't of Homeland Sec., *Drought Impacts to Critical Infrastructure* 7-8 (2015), http://content.govdelivery.com/attachments/USDHSFACIR/2015/04/30/file_attachments/386553/Drought+Impacts+to+Critical+Infrastructure.pdf.
[27] *See HIFLD Data Catalog*, Homeland Infrastructure Found.-Level Data (HIFLD) Subcomm., https://gii.dhs.gov/hifld/content/hifld-data-catalog (last visited June 8, 2021) (listing critical assets and assets that may become critical in certain cases); *see also* Brian E. Humphreys, Congressional Rsch. Serv., *Critical Infrastructure: Emerging Trends and Policy Considerations for Congress* at 2, 8 (2019), https://www.everycrsreport.com/files/20190708_R45809_54416d7b2f43d41696e8e971832aea5fe96a9919.pdf.
[28] Building National Capabilities for Long-Term Drought Resilience, 81 Fed. Reg. 16,053, 16,053 (Mar. 21, 2016).
[29] Operational Analysis Div., U.S. Dep't of Homeland Sec., *Drought Impacts to Critical Infrastructure* at 7–8 (2015), http://content.govdelivery.com/attachments/USDHSFACIR/2015/04/30/file_attachments/386553/Drought+Impacts+to+Critical+Infrastructure.pdf.

in a changing climate, and robust pollinator populations that are necessary for a wide range of crops grown in the U.S. and part of a healthy ecosystem. Funding, technical assistance, and support to aid producers in adopting climate-friendly agricultural practices, are also essential for promptly, equitably, and successfully transitioning to more resilient supply chains, and these supports also help farms better protect farmworker's health and safety, soils, and pollinators. Likewise, regionally adapted, publicly available seeds and breeds will be increasingly important to supply chain resilience in the face of climate change.

It is also important to note that, though our current agricultural system relies on large amounts of synthetic chemical inputs due to low adoption of healthy soil practices, such inputs are not essential. In fact, reliance on these inputs harms our ability to protect the elements that are indeed essential.

A. The USDA Should Recognize Support of Farmworkers as Essential.

As the Cybersecurity and Infrastructure Security Agency recognized in guidance issued during the COVID-19 pandemic, farmworkers are essential to supporting our food and agricultural system.[30] Indeed, there can be no question that support for farmworkers is essential to the ability of the food and agricultural sectors to survive and thrive. It is therefore imperative that the USDA look to adopt and advance policies that protect the health and safety of these essential workers.

In 2019, there were 1.18 million hired farmworkers in the United States.[31] According to the American Farm Bureau, however, agriculture needs 1.5 to 2 million workers each year.[32] In 2012, farm labor shortages caused $3.3 billion in missed Gross Domestic Product growth and $1.3 billion in unrealized farm income.[33] Farmers report labor shortages as the number one limiting factor for their farms.[34] According to data from the 2017 Census of Agriculture, wages, salaries, and contract labor costs represented just 12 percent of production expenses for all farms, but 43 percent for greenhouse and nursery operations and 39 percent for fruit and tree nut operations.[35]

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[30] *See* Advisory Memorandum from Brandon Wales, Acting Dir., Cybersecurity & Infrastructure Sec. Agency, 10 (Dec. 16, 2020), https://www.cisa.gov/sites/default/files/publications/ECIW_4.0_Guidance_on_Essential_Critical_Infrastructure_Workers_Final3_508_0.pdf.
[31] *See Farm Labor*, U.S. Dep't Agric., https://www.ers.usda.gov/topics/farm-economy/farm-labor/#size (last updated Apr. 22, 2020)
[32] *See Economic Impact of Immigration*, Am. Farm Bureau Fed'n, https://www.fb.org/issues/immigration-reform/agriculture-labor-reform/economic-impact-of-immigration/ (last visited June 21, 2020).
[33] *Id.*
[34] *See* Danilo Zak, *The Economic Impact of Undocumented Farmworkers*, Nat'l Immigr. F. (Mar. 18, 2020) https://immigrationforum.org/article/the-economic-impact-of-undocumented-farmworkers/.
[35] *See Farm Labor*, U.S. Dep't Agric., https://www.ers.usda.gov/topics/farm-economy/farm-labor/#size (last updated Apr. 22, 2020)

Food system workers are frequently exploited and their expertise is widely undervalued. A thriving food supply chain must fairly compensate and fully protect its workers and their communities.

B. The USDA Should Recognize Soil as Essential to Agricultural Supply Chains.

Soil is essential to U.S. agricultural production. Healthy, functioning soil provides nutrients, stores water, and offers physical support necessary for crop production and productivity on rangelands. Healthy soils can break down contaminants, regulate hydrological cycling, mitigate climate change, and provide additional ecosystem services.[36] Soil degradation and erosion pose a direct threat to agricultural productivity and the numerous ecosystem services provided by soil.

Evaluations of soil ecosystem services suggest that *supporting* soil functions such as nutrient cycling, water cycling, and biodiversity protections are valued up to $180 per hectare per year.[37] Additionally, *regulating* services like biological control of pests and diseases, climate regulation, and contaminant filtering are valued up to $6,402 per hectare per year, and *provisioning* services like biomass production, clean water provisions, and raw material production are valued up to $22,219 per hectare per year.[38] Despite their essential role, soils have been depleted and eroded through agricultural activities, which have resulted in losses of total soil on cropland and grazing lands. These losses of soil also result in losses of stored organic carbon and nutrients, thereby impacting climate, water pollution, and crop productivity.[39] Soil erosion in the U.S. has resulted in several tons of soil lost per hectare each year,[40] amounting to billions of dollars in total losses.[41]

C. The USDA Should Recognize Pollinators as Essential to Agricultural Supply Chains.

Pollinators are essential to crop production. Over 100 key U.S. food crops—including apples, cherries, blueberries, watermelons, pumpkins, tomatoes, and almonds—require

[36] *See* David A. Robinson et al., *On the Value of Soil Resources in the Context of Natural Capital and Ecosystem Service Delivery*, 78 Soil Sci. Soc'y Am. J. 685 (2014).
[37] Dollar values are in units of international dollars (id$), a hypothetical unit of currency used to standardize monetary value across countries by correcting to the same purchasing power that the U.S. dollar had at any given time. *See* Jón Ö. G. Jónsson & Brynhildur Davíðsdóttir, *Classification and Valuation of Soil Ecosystem Services*, 145 Agric. Sys. 24 (2016); *see also* Nicholas B. Comerford et al., *Assessment and Evaluation of Soil Ecosystem Services*, 54 Soil Horizons 1 (2013); Craig Bond et al., *Agricultural Producers and the Environment: A Stated Preference Analysis of Colorado Corn Producers*, 59 Can. J. Agric. Econ. 127 (2010).
[38] *Id.* at 32.
[39] *See* Jonathan Sanderman et al., *Soil Carbon Debt of 12,000 Years of Human Land Use*, 114 Proc. Nat'l Acad. Scis. 9575 (2017).
[40] *See* Mark Nearing et al., *Natural and Anthropogenic Rates of Soil Erosion*, 5 Int'l Soil and Water Conservation Rsch.77 (2017); *see also* Pasquale Borrelli et al., *An Assessment of the Global Impact of 21st Century Land Use Change on Soil Erosion*, 8 Nature Commc'ns 1 (2017).
[41] *See* Noel D. Uri & James A. Lewis, *The Dynamics of Soil Erosion in US Agriculture*, 218 Sci. Total Env't 45 (1998).

pollinators.[42] Globally, annual crop pollination services are valued at $195-387 billion.[43] In the U.S., pollinator-dependent crop production is valued at over $50 billion per year and crop production is already frequently limited by a lack of pollinators.[44] This limitation is likely to be exacerbated by ongoing threats to pollinator populations as detailed below.

D. The USDA Should Treat Access to Funding, Training, Education, and Technical Assistance as Essential to Agricultural Supply Chains.

A key ingredient in ensuring maximum availability of essential agricultural inputs such as soil health and pollinators is the adoption of more sustainable practices. This in turn, depends upon greater access to funding, research, training, education, and technical assistance, rendering these "essential goods" as well.

Federal funding for agroecological research has fallen sharply while the need for climate-smart systems and practices has become increasingly necessary. Agroecological research accounts for only 10% of research funded by the USDA's Research, Extension and Economics (REE) subagency, with less than 1% of funds supporting agroforestry research and less than 3% supporting research on complex crop rotations.[45] Although scientific research strongly supports the climate and environmental benefits of these practices, additional research on improving the efficacy of these practices and building resources for the most effective, context-specific applications of them is essential. Ensuring these transitions lead to verifiable and long-term improvements will also require expanded research on measuring outcomes following practice adoption.

In addition to more focused research on sustainable practices, tailored extension, technical assistance, and outreach programs focused on the most effective climate-smart approaches are essential. This includes support for diversified cropping systems (including agroforestry and silvopasture, where ecologically appropriate) and agroecology. For example, by integrating or retaining woody perennials into land used for production, agroforestry offers the highest sequestration potential among climate-smart practices on a per-acre basis and provides multiple benefits for farmers and rural communities. Yet there are few agricultural consultants or extension officials in the United States with the training and expertise necessary to help farmers plan for and implement agroforestry practices, and fewer than one-third of state extension systems have agroforestry programs.[46] Likewise, farmers interested in adopting these practices have few public sources of technical assistance or support.

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[42] *See Pollinators*, U.S. Dep't of Agric., https://www.usda.gov/pollinators (last visited June 21, 2020).
[43] *See* Rafaella Guimarães Porto et al., *Pollination Ecosystem Services: A Comprehensive Review of Economic Values, Research Funding and Policy Actions*, 12 Food Sec. 1425 (2020).
[44] *See* James R. Reillyet al., *Crop Production in the USA is Frequently Limited by a Lack of Pollinators*, 287 Proc. Royal Soc'y B: Biological Scis. 1 (2020); *see also* Nicholas W. Calderone, *Insect Pollinated Crops, Insect Pollinators and US Agriculture: Trend Analysis of Aggregate Data for the Period 1992–2009*, 7 PLoS ONE (2012); Dana M. Bauer & Ian S. Wing, *The Macroeconomic Cost of Catastrophic Pollinator Declines*, 126 Ecological Econs. 1 (2016).
[45] *See* Marcia S. DeLonge et al., *Investing in the Transition to Sustainable Agriculture*, 55 Env't Sci. & Pol'y 266 (2016).
[46] *See* Michael Jacobson & Shiba Kar, *Extent of Agroforestry Extension Programs in the United States*, 51 J. Extension v51 (2013).

E. The USDA Should Recognize Diversity in Seeds and Breeds as Essential to Agricultural Supply Chains.

Regionally adapted, diverse, and publicly available seeds and breeds are fundamental pieces of the supply chain. Our current system of agricultural has dramatically reduced the genetic diversity of major agricultural products, leaving the system highly vulnerable to pests, disease, and climate change, as well as to domination by very few agrichemical and input companies. We must increase investment in public breeding programs that give farmers seed and breed options that are specifically tailored to their growing conditions, that increase biodiversity, and that do not require expensive and harmful chemical inputs to survive.

F. Synthetic Chemical Inputs Are *Not* Essential to Sustainable Agricultural and Food Product Supply Chains.

A sustainable, regenerative agricultural and food system does not depend on synthetic chemical inputs. We contest the USDA's overbroad designation of "fertilizer" and "pesticides" as essential goods and materials. While our current highly industrialized system does rely heavily on pesticides, fertilizer, and additives (including antibiotics), the use of these chemicals is harmful to human health and the environment and ultimately, as these comments discuss thoroughly in other sections, hampers the creation of a more resilient food system that is less reliant on these synthetic inputs.

Our current system of monocropping depletes soil nutrients, necessitating the use of external fertilizer.[47] However, the adverse environmental impacts of excessive fertilizer applications are well documented. Agricultural nitrogen applications contribute to nitrate pollution of drinking water and eutrophication of fresh water and marine ecosystems, including creation of algal blooms and "dead zones."[48] Indeed, 89% of nitrogen inputs into the Mississippi River are from agricultural runoff.[49] Nitrogen fertilizer use also contributes to N_2O emissions, which have a global warming potential approximately 300 times greater than that of CO_2.[50]

The amount of fertilizer we are currently using is not necessary. Ample research demonstrates that reductions in synthetic fertilizer use are possible without negatively impacting yields.[51] Excessive synthetic fertilizer application can also decrease soil microbial diversity, alter natural soil microbial composition, cause soil acidification, and lead to a buildup of salts, heavy metals, and nitrate.[52]

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[47] *See* Food Print, *How Industrial Agriculture Affects Our Soil*, https://foodprint.org/issues/how-industrial-agriculture-affects-our-soil/#easy-footnote-bottom-6-1260; *see also* Home Nat'l Oceanic & Atmospheric Admin., *NOAA Forecasts Average-sized 'dead zone' for the Gulf of Mexico* (June 3, 2021), https://www.noaa.gov/news-release/noaa-forecasts-average-sized-dead-zone-for-gulf-of-mexico.

[48] Allen G. Good & Perrin H. Beatty, *Fertilizing Nature: A Tragedy of Excess in the Commons*, 9 PLoS Biology e1001124 (2011).

[49] *Id.*

[50] *Id.*

[51] *Id*. at 5.

[52] *See* Food Print, *How Industrial Agriculture Affects Our Soil*, https://foodprint.org/issues/how-industrial-agriculture-affects-our-soil/#easy-footnote-bottom-6-1260.

Research shows that pesticides similarly harm soil health by decreasing the diversity of soil invertebrates, bacteria, and fungi. One study found that pesticides harmed beneficial soil invertebrates in 70.5 percent of cases reviewed.[53] In addition to their impact on essential soil resources, pesticides also pose a risk to farmworker health and pollinator populations.

The use of antibiotics in animal agriculture is also unnecessary and is instead the result of an unsustainable system of livestock production that has grave environmental and public health harms. CAFOs administer antibiotics to animals as a regular part of their diet to prevent them from getting sick in the conditions under which they are confined. The antibiotics also fatten the animals. This routine use benefits CAFO operators, helping to make CAFOs more profitable and more likely to persist. This widespread use of antibiotics poses a significant independent threat to public health. Studies have shown that such use contributes to a higher prevalence of antibiotic resistant pathogens, and to increased antibiotic resistant infections in humans. Today, about 35,000 people in the US die each year because of an antibiotic resistant disease and the CDC estimates over 2.3 million people become ill. The CDC, World Health Organization, and many others view antibiotic resistant bacteria to be among the most significant public health threats. Antibiotic use is thus necessitated by the unnatural and unnecessary CAFO system, is not necessary for raising livestock in more sustainable ways and should not be deemed essential to the agriculture system.

Our thriving organic sector[54] demonstrates that supply chains can succeed, and actually become more resilient, without the use of synthetic inputs. Specifically, instead of relying on synthetic inputs, organic regulations [Sections 205.203 & 205.205] require producers to:

a. Maintain or improve soil organic matter.
b. Select and implement tillage and cultivation practices that maintain or improve the physical, chemical, and biological condition of soil and minimize soil erosion.
c. Manage crop nutrients and soil fertility through rotations, cover crops, and the application of plant and animal materials.
d. Use crop rotations and cover crops to maintain and improve soil organic matter, and to manage plant nutrients and pests.

Organic and regenerative agricultural practices build healthy farm ecosystems that take the place of synthetic inputs; in contrast, merely switching to different chemical inputs not only fails to address upstream emissions and pollution that result from fertilizer manufacturing, but also fails to incentivize transitions to systems that build resilience to climate impacts and result in more fertile soil. Conservation crop rotations and diversified cropping systems can promote soil health by introducing a wider range or types of inputs into soil, maintaining residue throughout the

[53] *See* Tari Gunstone et al., *Pesticides and Soil Invertebrates: A Hazard Assessment. Front. Environ,* 9 Frontiers Env't Sci. 1 (2021).
[54] *See* Organic Trade Ass'n (OTA*), U.S. Organic Sales Soar to New High Of Nearly $62 billion in* 2020, https://ota.com/news/press-releases/21755 (organic sales grew more than 12% in 2020, to $61.9 billion).

year, sustaining a living root that stores additional carbon, and minimizing soil disturbance.[55] These practices can also reduce reliance on pesticides that are harmful to pollinators and on fertilizers which contribute to GHG emissions.[56] Cover crops can also reduce the need for fertilizer and suppress weeds.[57] Accordingly, these synthetic inputs are not essential goods and materials.

G. The USDA Should Support Local, Transparent and Resilient Markets by Adopting Values-Based Procurement Goals.

Local, transparent, diverse, and resilient markets are essential to ensuring access to nutritious food for all communities. By adopting a values-based procurement policy, the USDA and other federal agencies that purchase food can incentive these supply chain goals. The Good Food Purchasing Program provides a metric-based framework for large institutions to set measurable sourcing targets in five value categories: local economies, nutrition, valued workforce, environmental sustainability, and animal welfare. In addition to adopting the GFPP, the USDA should also encourage and support other federal departments and agencies that procure food in doing so.

The GFPP build supply chain resilience in multiple ways. First, it calls for institution to increase the amount of foods procured from BIPOC and socially disadvantaged producers; from independent producers; and from local and regional producers and food businesses. Second, it calls for increased procurement from producers who are adopting sustainable practices and thus incentives wider adoption of such practices. Third, it ensures that workers are treated fairly and are protected. Finally, it incentivizes the production of healthier foods and ensures that institutions are distributing nutritious food to all those served.

In order to successfully source foods from a larger number of smaller producers and businesses, greater coordination and resources are required. Specifically, the USDA should provide technical assistance to farmers, makers, and small food manufacturers to overcome barriers to entry for institutional markets that take into account language and cultural differences. USDA should also provide coordination needed to ensure that small producers can together meet large contract demands. Additionally, the USDA should report supplier diversity data, identify scale appropriate pathways for small and mid-size food businesses to engage in public contracting and scale over time, and provide technical assistance to support businesses new to public procurement. Further, the USDA could provide financial incentives to increase procurement of foods sourced from these producers through increased meal reimbursements,

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[55] *See* Nat. Res. Conservation Serv., Conservation Practice Standard Conservation, *Crop Rotation Code 328* (2015), https://efotg.sc.egov.usda.gov/references/public/IA/Conservation_Crop_Rotation_328_STD_2015_05.pdf; *see also* Amadou Maiga, *Responses of Soil Organic Carbon, Aggregate Stability, Carbon and Nitrogen Fractions to 15 and 24 years of No-till Diversified Crop Rotations*, 57 Soil Rsch. 149 (2019).

[56] *See* David Weisberger et al., *Does Diversifying Crop Rotations Suppress Weeds? A Meta-Analysis*, 14 PLoS ONE e0219847 (2019).

[57] *See* C. Tonitto et al., *Replacing Bare Fallows With Cover Crops in Fertilizer-Intensive Cropping Systems: A Meta-analysis of Crop Yield and N Dynamics*, 112 Agric., Ecosystems & Env't 58 (2006); *see also* Meagan E. Schipanski et al., *A Framework for Evaluating Ecosystem Services Provided By Cover Crops in Agroecosystems*, 125 Agric. Systems 12 (2014); Jason P. Kaye & Miguel Quemada, *Using Cover Crops to Mitigate and Adapt to Climate Change. A Review*, 37 Agronomy for Sustainable Dev. 1 (2017).

meal budgets, or grants, combined with a source-verification and public accountability mechanism.

Values-based procurement requires increased data transparency and public reporting along the supply chain in order to be able to track progress on procurement goals. The USDA should request that the largest food producing companies, especially the meat companies, publicly disclose performance on their environmental, social and governance goals, including treatment of farmers and ranchers, debt structure for their contracted farmers and ranchers, and treatment of workers in the processing and packing facilities, especially in light of COVID. Information that companies should be required to disclose includes: health and safety data; wage and hour data; labor law citations; legal cases; and data on accidents and deaths.

For public accountability purposes, the USDA should report publicly about where the USDA sources its food items along the entire supply chain and should provide technical assistance to help other federal agencies do the same. The USDA should also encourage food companies to invest in chain transparency infrastructure and technology through incentives and other mechanisms in order to comply with transparency requirements.

3. Manufacturing or other capabilities necessary to produce the materials identified in (i) and (ii) of this section, including emerging capabilities.

A. Water

The USDA should address threats to water quantity by improving irrigation practices to increase water use efficiency. The USDA should also address threats to water quality by incentivizing reductions in excess fertilizer use and reductions in pesticide and antibiotic use, as these inputs run off into waterways and contaminate water quality.

The USDA should also accelerate efforts to transform manure management practices to avoid water pollution from animal feeding operations. Poor manure management practices, such as storage of manure in open and unlined lagoons or application on fields at concentrations over agronomic guidance, pose a serious threat to water quality through excess nutrients and pathogens. These risks are exacerbated by extreme weather events which lead to overflowing lagoons, runoff, and contaminated waterways. The USDA should coordinate with the EPA to ensure that water pollution risks from animal feeding operations are minimized and monitored.

B. Farmworkers

Many of the farmworkers feeding our nation are at high risk of pesticide poisoning, lack immigration protections, and lack access to adequate health care. To ensure a resilient agricultural sector, the USDA must do more to protect and uplift farmworkers. Specifically, there is a need to strengthen worker protection standards so they adequately protect farmworkers from pesticides, heat stress, and wildfire risk, ensure safe and healthy housing, and ensure protections for immigrants.

C. Soil Health

Conserving and restoring degraded soils is necessary to building healthy soil, as well as ensuring that the nutrients and associated services provided by healthy soil are available for crop production. Several healthy soil practices identified by the USDA NRCS have the potential to protect soils from erosion, diversify inputs to soil, and rebuild organic matter and nutrients. The USDA should focus on increasing adoption of these healthy soil practices through increased access to conservation funding for practices such as cover crops, agroforestry, conservation crop rotations and perennial crops, reduced tillage, and other practices that build and protect soil. The USDA should also improve oversight of grazing land activities which lead to soil erosion and incentivize transitions towards improved grazing practices such as adaptive multipaddock grazing, outcome based grazing, and other forms of prescribed grazing which reduce the likelihood of soil erosion. Additionally, the USDA should expand outreach and technical assistance to support transitions to healthy soil practices on croplands and transitions to advanced grazing practices with reduced impacts on soils in rangelands. These practices not only help protect and build the essential resource of soil, but also increase resiliency to climate extremes — helping reduce the vulnerability of agricultural production and associated supply chains to extreme weather events.

D. Pollinators

Reducing reliance on pesticides and eliminating the use of most harmful pesticides is essential to maintaining healthy pollinator populations. The USDA should increase support for pollinator-friendly practices, such as cover crops, diversified cropping rotations, agroforestry, and conservation practices which protect native grasslands and other pollinator habitats. The USDA should also coordinate with the EPA to ensure that pesticide registrations and risk evaluations accurately reflect the science on harms from neonicotinoids and other systemic insecticides on pollinator populations.

E. Access to Funding, Research, Training, Education, and Technical Assistance

The USDA must devote more resources to relevant research, education, training, and technical assistance to ensure that farmers and ranchers have the skills and funding they need to shift to more sustainable practices which will, in turn, help diversify and strengthen the agricultural supply chain. The USDA should expand opportunities for support through the cooperative extension system, climate hubs, and the development of regional agroforestry centers and long-term agroecological research sites with a focus on facilitating transitions to climate-smart practices. By increasing yields and resiliency, these resources will help protect the agricultural supply chain from the threats of climate change.

We need robust investment in sustainable agriculture research programs, including the Agriculture and Food Research Initiative (AFRI), the Organic Agriculture Research and Extension Initiative (OREI), and the Sustainable Agriculture Research and Education (SARE) Program, with a focus on effective climate change strategies in the agriculture sector. Specific examples of the type of research that should be conducted include:

- continued research into the role of organically management soils in carbon sequestration, with a particular focus on soil depth of carbon sequestration and storage;
- research into the development of credible, low-cost on-farm tools for documenting and tracking long-term improvements in soil health and carbon sequestration related to various land management systems, including organic management systems;
- research to advance organic no-till and low-till systems, and to measure the impact of tillage of organically managed soils with regard to carbon sequestration strategies; and,
- research regarding the opportunities for and barriers to local government conversion of land management practices for parks, transportation rights-of-way and other land areas to organic-based management practices. This research should include an analysis of how federal preemption policies that prevent localities from regulating the use of pesticides impact the ability of local governments to convert to organic land management systems.

In addition, USDA's competitive grant research programs should specifically invest $100 million annually to significantly expand resources for public cultivar and animal breed development to ensure that farmers have access to seeds and breeds that are regionally adapted to changing climates and to optimize production using climate friendly farming systems. In addition, the Administration should use the statutory authorities of the Hatch Act, Smith-Lever Act and the Second Morrill Act, which authorize agricultural research and extension funding at the Nation's Land Grant Universities (LGUs) and State Experiment Stations, including 1890 Land Grant Institutions, to incentivize all LGUs to revitalize their public plant and animal breeding programs. The focus for this increased funding should be to ensure the farmers and ranchers of each state or region have access to regionally adapted cultivars and animal breeds that are ideally suited to their changing climates and to farming systems that are proven to be climate friendly. Similar incentives should be provided for the nation's Hispanic-Serving Agricultural Colleges and Universities (HSACUs) and Tribal Colleges.

F. We Must Decrease Dependence on Synthetic Inputs.

To decrease our dependence on synthetic chemical fertilizer and pesticide, we must shift to more organic and regenerative agricultural practices. As noted above, practices such as cover-cropping and crop rotations can decrease the need for fertilizer and pesticides, and thus make our food system less reliant on these chemical inputs. This will take an influx of resources – including funding for technical assistance, incentive payments, access to equipment, more research, and an evaluation and revision of current USDA policies that promote the use of fertilizer and pesticide.

In addition, USDA should create a comprehensive program to support farmers transitioning to organic and regenerative agriculture, particularly for farmers of color and small- and mid-sized farmers who struggle to access USDA resources. Barriers to participation should be minimized and the program should take a "whole farm" approach that offers flexible financial support, facilitates mentor/mentee opportunities, includes professional development opportunities for non-owners and farm workers, expands market opportunities and infrastructure, and leverages the capacity and expertise of regional organizations that have strong connections to sustainable farming.

4. **Defense, intelligence, cyber, homeland security, health, climate, environmental, natural, market, economic, geopolitical, human-rights or forced-labor risks or other contingencies that may disrupt, strain, compromise, or eliminate the supply chain.**

A. Climate Change Will Disrupt, Strain and Compromise Agricultural Supply Chains.

Climate change will continue to alter patterns of temperature and precipitation, the frequency and severity or storms, floods, droughts, wildfires, and other extreme weather events, and increase risks of pest and disease outbreaks.[58] Each of these compounding impacts pose an ongoing threat to food system supply chains overall, and specifically to each of the critical and essential goods and materials described above. Many of these impacts — including increased pest, weed, and disease outbreaks, intense and variable temperature and precipitation patterns, and shifts in plant and animal migrations and ranges — are already underway and are expected to continue for several decades at a minimum.[59]

Climate change directly threatens crop productivity, with projections suggesting that it could reduce global crop production by 9% in the 2030s and by 23% in the 2050s.[60] Higher temperatures are associated with declines in crop yields for many crops,[61] and increasingly frequent floods and droughts are predicted to result in additional crop damage and risks to livestock. Among other climate-related challenges, heat stress negatively affects livestock health and increases susceptibility to disease. These impacts translate into reductions in livestock productivity and declines in feed efficiency and pose serious concerns for animal welfare.[62]

In addition to threatening crop and livestock productivity overall, climate change poses a direct threat to essential goods and materials underlying production, including soil health, pollinators, and water quantity and quality. Increases in extreme weather, fires and warming all jeopardize soil health and accelerate losses of stored carbon and nutrients in soil. Shifts in temperature impact pollinator ranges, migrations, and the synchronization of biological events

[58] *See* IPCC, *2013: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge Uni.Press); *see also* IPCC, *2014: Climate Change 2014: Impacts, Adaptation and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge Uni. Press).
[59] *See* Peter Backlund et al., U.S. Climate Change Sci. Program & the Subcomm. on Global Change Rsch., *The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity in the United States* (2008), https://www.usda.gov/sites/default/files/documents/CCSPFinalReport.pdf.
[60] *See* Mekbib G. Haile et al., *Impact of Climate Change, Weather Extremes, and Price Risk on Global Food Supply*, 1 Econ. Disasters & Climate Change 55 (2017).
[61] *See* A. J. Challinor et al., *A Meta-analysis of Crop Yield Under Climate Change and Adaptation*, 4 Nature Climate Change 287 (2014).
[62] *See* Umberto Bernabucci, *Climate Change: Impact on Livestock and How Can We Adapt*, 9 Animal Frontiers 3 (2019).

such as the timing of pollinator activities and crop emergence.[63] Increasingly frequent droughts and extreme precipitation events threaten water quality and quantity. Furthermore, increases in disease and pest risks associated with climate change contribute to declines in pollinator health and abundance.

Climate change also poses a grave threat to the health and safety of farmworkers, who are often on the frontlines of experiencing the impacts of climate change on agriculture. The Center for Disease Control and Prevention estimates that the number and rate of deaths among crop workers due to heat stress have dramatically increased from 1992 to 2006, with hundreds of farmworkers dying from heat-related causes over the study period.[64] Many more farmworkers experience health impacts from heat stress, including heat exhaustion, stroke, and other illnesses.[65] With projections of increased summer temperatures and heat waves, farmworkers are likely to experience more frequent heat stress with climate change.

B. The USDA Affords Little Protections to Meet the Needs of Farmworkers.

Immigrants are the backbone of agricultural labor. According to data from the National Agricultural Workers Survey from 2015-2016, 69% of hired farmworkers interviewed were born in Mexico[66] and 83% of total farmworkers identified as Hispanic.[67] The majority (71%) are not U.S. citizens and only 51% have work authorization.[68] Indeed, undocumented immigrants contribute $9 billion to the fruit and vegetable industry alone.[69]

Farmworkers face language barriers: 77% said Spanish was the language they were most comfortable conversing in.[70] In rating their English language skills, 30% of farmworkers reported that they could not speak English "at all," 41% said they could speak English "a little" or "somewhat," while only 29% said they could speak English "well."[71] In terms of their ability to read English, 41% of workers reported they could not read English "at all."[72] The average level of formal education was completion of eighth grade.[73]

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[63] *See* Adam J Vanbergen & The Insect Pollinators Initiative, *Threats to an Ecosystem Service: Pressures on Pollinators*, 11 Frontiers Ecology & Env't 251 (2013).
[64] *See* Ctrs. for Disease Control & Prevention (CDC), *Heat-related Deaths among Crop Workers—United States, 1992—2006*, 57 Morbidity & Mortality Wkly. Rep. 649 (2008).
[65] *See* Pamela Rao, *Heat Related Illnesses An Occupational Health Concern for Farmworkers*, Farmworker Just. & Migrant Clinicians Network (2007), https://www.migrantclinician.org/files/resourcebox/heat_monograph.pdf.
[66] *See* JBS Int'l, *Findings from the National Agricultural Workers Survey (NAWS) 2015-2016: A Demographic and Employment Profile of United States Farmworkers* at i (2018), https://www.dol.gov/sites/dolgov/files/ETA/naws/pdfs/NAWS_Research_Report_13.pdf.
[67] *Id.*
[68] *Id.*
[69] *See* Danilo Zak, *The Economic Impact of Undocumented Farmworkers*, Nat'l Immigr. F. (Mar. 18, 2020) https://immigrationforum.org/article/the-economic-impact-of-undocumented-farmworkers/.
[70] *See* JBS Int'l, *Findings from the National Agricultural Workers Survey (NAWS) 2015-2016: A Demographic and Employment Profile of United States Farmworkers* at ii (2018), https://www.dol.gov/sites/dolgov/files/ETA/naws/pdfs/NAWS_Research_Report_13.pdf.
[71] *Id.* at ii.
[72] *Id.*
[73] *See id*.

In addition, farmworkers fall within the lower socioeconomic bracket. Their mean and median income levels were in the range of $17,500 to $19,999, while mean and median family incomes were in the range of $20,000 to $24,999.[74] A full 33% had family incomes below the poverty line.[75]

Also problematic, despite the many health risks associated with agricultural work, most farmworkers do not have employer-provided health insurance.[76] Just 47% of farmworkers reported having *any* kind of health insurance, of which 29% said they received it from their employer and 43% from the government.[77] A significant number of farmworkers, 34%, said they paid for their last health care visit out of their own pocket.[78]

Not only do many farmworkers lack health insurance, but farmworkers face numerous other obstacles in accessing healthcare as well. While language barriers can prevent them from receiving adequate training to prevent illness in the first instance, it can also be a barrier to receiving proper medical care when they need it, as providers may not have language assistance and lack cultural competency training and/or awareness or capability. Moreover, due to the seasonality of farm work, farmworkers often must continuously find new health care providers. Even when they are accessible, many health care providers receive little to no occupational and environmental health training during their medical education. Supervisors may not provide pesticide information needed to adequately treat the farmworker. The sparsity of clinics in rural areas also makes it likely that the farmworker will have to travel a long distance to obtain health care, which can be a challenge given that many farmworkers do not have access to personal automobiles.[79]

5. **Resilience and capacity of American manufacturing supply chains, including food processing (i.e., meat, poultry, and seafood processing) and distribution, and the industrial and agricultural base – whether civilian or defense – of the United States to support national, economic, and nutrition security, emergency preparedness, and the policy identified in section 1 of E.O. 14017, in the event any of the contingencies identified in subsection (iv) of this section occurs.**

The U.S. food and agriculture system is currently ill equipped to respond to the threats of climate change and other system shocks. *First*, our food system relies on chemical inputs manufactured by just a small handful of companies. Use of pesticides, excess antibiotics, and fertilizers threaten farmworkers and pollinators, who will already be under increased stress due to climate change. Climate change is also likely to exacerbate the impacts of pesticide resistance.[80] *Second*, our nation's farmworkers lack sufficient protections from the impacts of

[74] *See id.* at iii.
[75] *Id.*
[76] *Id.* at iv.
[77] *Id.*
[78] *Id.*
[79] *See* Joanne Bonnar Prado et al., *Acute Pesticide-Related Illness Among Farmworkers: Barriers to Reporting to Public Health Authorities*, 22 J. Agromedicine 395 (2017).
[80] *See* Jian Pu, *Climate Change and the Genetics of Insecticide Resistance*, 76 Pest Mgmt. Sci. 846 (2019); *see also* Maor Matzrafi, *Climate Change Exacerbates Pest Damage through Reduced Pesticide Efficacy*, 75 Pest Mgmt. Sci. 9 (2018).

climate change. *Third*, we rely too heavily on large industrial-scale producers rather than providing support for a more diverse community of small-scale producers. *Finally*, there is not currently widespread adoption of climate-resilient practices.

A. Reliance on Chemical Inputs is a Risk to Resiliency.

The U.S. food and agricultural system relies heavily on chemical pesticides and fertilizers. In 2011 and 2012, U.S. pesticide usage totaled 1.1 billion pounds. This comes with significant economic costs: in 2012, U.S. producers spent $9 billion on pesticides[81] and in 2007 and 2012, pesticides accounted for 4.3% and 5% of total farm expenditures respectively.[82]

Data from the Agricultural Management Use Survey shows how widespread applications of fertilizer and pesticides are across key U.S. crops[83]:

Crop	Percent of planted acres treated with N	Pounds per treated acre of N applied
Corn	96	143
Soybeans	27.16	15
Rice	95	170
Barley	86	73
Durum Wheat	98	61
Oats	59	56

Crop	Percent of planted acres treated with pesticide	Pounds per treated acre of pesticide applied
Corn	97	2
Soybeans	97	2
Rice	97	4
Barley	82	1
Durum Wheat	98	1
Oats	33	0.48

This produces multiple risks to the resilience of our food system. To begin, this places the future of our food system largely in the hands of just a few companies. In recent years, ChemChina acquired Syngenta, and two major mergers—that of Dow Chemical with DuPont and Bayer with Monsanto—have taken place.[84] Individual companies now control vast shares in the market for seeds and agricultural chemicals. Disruptions within any one of these companies

[81] *See* EPA, *Pesticide Industry Sales and Usage: 2008-2012 Market Estimates* at 4 (2017), https://www.epa.gov/sites/production/files/2017-01/documents/pesticides-industry-sales-usage-2016_0.pdf.
[82] *Id.* at 8.
[83] Data pulled from ARMS Tailored Reports: Crop Production Practices, https://data.ers.usda.gov/reports.aspx?ID=17883.
[84] *See* James M. MacDonald, *Mergers in Seed and Agricultural Chemicals: What Happened?*, U.S. Dep't of Agric., Econ. Rsch. Serv. (Feb. 15, 2019), https://www.ers.usda.gov/amber-waves/2019/february/mergers-in-seeds-and-agricultural-chemicals-what-happened/.

would have significant impacts on our entire agricultural system and the decrease in competition reduces incentives for innovation.

The use of synthetic chemicals also impairs our food system's ability to cope with the impacts of climate change. As described in the previous section, climate change already threatens and will continue to increase risks to farmworkers and pollinators. Pesticides already threaten both of these groups. USDA must incentivize practices that reduce pesticide use and increase farmworker and pollinator protections to increase resilience to climate change.

Another way in which reliance on pesticides weakens our ability to respond to climate change and shocks is by increasing the food system's vulnerability to pesticide resistance. Pesticide resistance is already leading to agricultural losses that climate change will exacerbate. For example, the rise in use of the herbicide glyphosate led to 90% of all U.S. maize, soybean, and cotton hectares being planted with herbicide-tolerant varieties between 1996 and 2014. Over 40 weed species eventually developed resistance.[85] Weeds have developed resistance to every herbicide class in use and more than 550 arthropod species have resistance to at least one insecticide.[86] Agricultural losses due to pesticide resistance have been estimated at U.S. $10 billion per year.[87] Climate change, and resulting changes in temperature, are likely to reduce the efficacy of pesticides, compounding this problem.[88]

B. Lack of Farmworker Protections Threatens Resiliency.

A resilient food system should not depend on people putting their health and safety on the line to feed the country—yet that is what farmworkers currently do. Farmworkers face exposure to pesticides, high temperatures, and wildfire smoke—and climate change will increase these risks. Yet, there are few protections in place to safeguard against these harms.

Current agricultural worker protection standards do not fully protect farmworkers from pesticides. The CDC's National Environmental Public Health Track Network logged 401 instances of reported unintentional-occupational pesticide exposure in California in 2017.[89] As EPA explained in 2015, "the farmworker community, due to occupation, economic status, health, language and other sociodemographic characteristics, faces an increased risk of pesticide exposure."[90] Indeed, farmworkers' persistent exposure to harmful pesticides has resulted in an average of 57.6 out of every 100,000 agricultural workers' reporting acute pesticide poisoning,

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[85] *See* Fred Gould et al., *Wicked Evolution: Can we Address the Sociobiological Dilemma of Pesticide Resistance?*, 360 Sci. 728 (2018).
[86] *Id.*
[87] *Id.* at 2.
[88] *See* Maor Matzrafi, *Climate Change Exacerbates Pest Damage through Reduced Pesticide Efficacy*, 75 Pest Mgmt. Sci. 9 (2018).
[89] *See* Nat'l Env't Pub. Health Tracking Network, Ctrs. for Disease Control & Prevention (Follow "Step 1: Content" Click "Pesticides Exposure," Select Indicator "Reported Pesticide Exposures," Select Measure "Number of Reported Exposures to All Pesticides," Follow "Step 2" Geography," Click "National by State." Follow "Step 4: Time," Click "2017," Follow "Step 5: Advanced Options," Click on "Unintentional-Occupational" under "Exposure Reason," https://ephtracking.cdc.gov/DataExplorer/.
[90] Pesticides; Agricultural Worker Protection Standard Revisions, 80 Fed. Reg. 67,496-01, 67,556 (Nov. 2, 2015) ("2015 Rule").

illness or injury each year. These numbers exclude the many workers who suffer chronic health problems as a result of pesticide exposures, and do not factor in the known under-reporting of pesticide poisonings and illnesses.[91] EPA has recognized that farmworkers and communities situated near agricultural establishments are vulnerable communities that are particularly susceptible to pesticide exposure.[92]

Farmworkers, other agricultural workers, and communities situated near concentrated animal feeding operations are also exposed to the impacts of the overuse of antibiotics in agriculture. Antibiotics are routinely used in animal agriculture and this often unnecessary and dangerous excess use of antibiotics accounts for the majority of antibiotic use in the U.S. In 2017, livestock-uses accounted for nearly two-thirds of medically important antibiotic use.[93] Antibiotics are also authorized for use on certain crops, despite limited efficacy of such applications on treating crop diseases. These practices ultimately expose farmworkers and others to antibiotics and contribute to the antibiotic-resistance crisis, in which antibiotic-resistant diseases have been proliferating. Several studies have shown that people who work in the meat industry are more likely to carry resistant bacteria on their bodies and into their communities.[94] In addition, agricultural workers are at higher risk from antibiotic-resistant bacteria, and communities near livestock facilities or fields treated with livestock manure, are more likely to be exposed to and infected by antibiotic-resistant bacteria.[95] Continuing the excessive use of antibiotics in agriculture will threaten farmworkers and others as antibiotic resistant diseases proliferate and as climate change accelerates the risk of antibiotic resistance.[96]

During the summer of 2020, farmworkers in California were under siege by multiple threats of pesticides, COVID-19, and wildfire smoke.[97] Raging wildfires contributed to high

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[91] *See* Joanne Bonnar Prado et al., *Acute Pesticide-Related Illness Among Farmworkers: Barriers to Reporting to Public Health Authorities*, 22 J. Agromedicine 395 (2017).
[92] *See* 2015 Rule at 67,502.
[93] *See* U.S. Food & Drug Admin., 2017 Summary Report Antimicrobials Sold or Distributed for Use in Food-Producing Animals (2018), https://www.fda.gov/media/119332/download.
[94] *See* I. G. Wilson, *Airborne Campylobacter Infection in a Poultry Worker: Case Report and Review of the Literature*, 7 Communicable Disease & Pub. Health 349 (2004); *see also* Marie A. de Perio et al, *Campylobacter Infection in Poultry-Processing Workers, Virginia, USA, 2008–2011*, 19 Emerging Infectious Diseases 286 (2013); E. J. Watkins et al, *Septicaemia in A Pig-farm Worker*, 357 Lancet 38 (2001); Oliver Denis et al., *Methicillin Resistant Staphylococcus Aureus ST398 in Swine Farm Personnel, Belgium*, 15 Emerging Infectious Diseases 1098 (2009); Gomez E. et al., Streptococcus suis-Related Prosthetic Joint Infection and Streptococcal Toxic Shock-like Syndrome in a Pig Farmer in the United States, 52 J. Clinical Microbiology 2254 (2014); Heiman F. L. Wertheim et al., Streptococcus suis: An Emerging Human Pathogen, 48 Clinical Infectious Diseases 617 (2009).
[95] *See* Eric S. Johnson & Harrison Ndetan, *Non-cancer Mortality in Poultry Slaughtering/Processing Plant Workers Belonging to a Union Pension Fund*, 37 Env't Int'l 322 (2011); *see also* Eric S. Johnson et al., Update of Cancer and Non-Cancer Mortality in Missouri Poultry Cohort, 54 Am. J. Indus. Med. 49 (2011); R. S. Quilliam et al., *Subclinical Infection and Asymptomatic Carriage of Gastrointestinal Zoonoses: Occupational Exposure, Environmental Pathways, and the Anonymous Spread of Disease*, 141 Epidemiological Infections 2011 (2013).
[96] *See* Alejandra Rodriguez-Verdugo et al., *Compounding Effects of Climate Warming and Antibiotic Resistance*, 23 iScience 101024 (2020); *see also* Dereck R. MacFadden et al., *Antibiotic Resistance Increases with local Temperature*, 8 Nat. Climate Change 510 (2018).
[97] *See* Somini Sengupta, *Heat, Smoke and Covid are Battering the Workers Who Feed America*, N.Y. Times (Sept. 4, 2020), https://www.nytimes.com/2020/08/25/climate/california-farm-workers-climate-change.html.

temperatures and dangerous air quality. Farmworkers—not having access to paid time off even amidst these threats—continued to harvest crops.[98] A poll by United Farm Workers found that 84% of farmworkers did not receive a mask as required by California's new standards for protecting outdoor workers from smoke.[99]

Rising temperatures will also reduce the viability of personal protective equipment (PPE) to reduce farmworker exposures to pesticides because of its contribution to heat stress. Farmworkers already die of heat-related causes at roughly 20 times the rate of workers in all other civilian occupations.[100] The addition of PPE can add up to 12°F to the "feels like" temperature,[101] and coveralls can increase the "feels like" temperature by up to 27°F.[102] Furthermore, heat stress can also increase susceptibility to pesticides and exacerbate their human health effects.[103]

EPA has acknowledged the risks of heat stress associated with PPE. When promulgating a revised Worker Protection Standard, for example, EPA agreed that "heat stress can be a problem for workers…when employees must wear PPE." 80 Fed. Reg. 67,496, 67,527 (2015). The Agency has stated that "the addition of PPE…involves an additional burden to the user due to…increased heat stress and respiratory stress."[104]

C. Reliance on Large-scale Intensive Production is Counter to Building Resiliency.

The U.S. food system relies heavily on a small number of large-scale producers. Four percent of farms in the U.S. account for 60% of total agricultural land.[105] *Less than one percent*

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[98] *Id.*

[99] *See* Erika Mahoney, *Farm Workers Face Double Threat: Wildfire Smoke and COVID-19*, NPR (Sept. 7, 2020), https://www.npr.org/2020/09/07/909314223/farm-workers-face-double-threat-wildfire-smoke-and-covid-19.

[100] *See* Ctr. for Disease Control & Prevention, *Heat Related Deaths among Crop Workers—United States, 1992–2006*, 57 Morbidity & Mortality Weekly Rep. 649 (2008).

[101] *See* Wash. State Legislature (WSL), Chapter 296–307 WAC: Safety Standards for Agriculture (2018), https://lni.wa.gov/safety-health/safety-rules/chapter-pdfs/WAC296-307.pdf.

[102] *Personal Protective Equipment (PPE)*, Chem. Hazards Emergency Med. Mgmt. (CHEMM), https://chemm.nlm.nih.gov/ppe.htm.

[103] *See* Union of Concerned Scientists, *Farmworkers at Risk: The Growing Dangers of Pesticides and Heat*, https://www.ucsusa.org/sites/default/files/2019-12/farmworkers-at-risk-report-2019-web.pdf; *see also* Junhui Wang et al., *Ambient Temperature and Pesticide Poisoning: A Time-Series Analysis*, Int'l J. Env't Health Rsch. (2018); Richard J. Johnson et al., *Chronic Kidney Disease of Unknown Cause in Agricultural Communities*, 380 New Eng. J. Med. 1843 (2019); Cristina Fortes et al., *Occupational Exposure to Pesticides with Occupational Sun Exposure Increases the Risk for Cutaneous Melanoma*, 54 J. Occupational & Env't Med. 370 (2016); Christopher J. Gordon & Lisa R. Leon, *Thermal Stress and the Physiological Response to Environmental Toxicants*, 20 Revs. Env't Health 235 (2011).

[104] EPA, Chlorpyrifos: Updated Occupational and Residential Exposure Assessment for Registration Review 33, EPA-HQ-OPP-2008-0850-0196 (Dec. 31, 2014), https://www.regulations.gov/document ?D=EPA-HQ-OPP-2008-0850-0196.

[105] *See* U.S. Dep't of Agric., Nat'l Agric. Stat. Serv., 2017 Census of Agriculture USDA 2017, Data Release at 12 (April 11, 2019), https://www.nass.usda.gov/Newsroom/Executive_Briefings/2019/04-11-2019.pdf.

of farms provide 35% of the total value of production.[106] In addition, farmers are a homogenous group and high barriers to entry prevent young, new and beginning, and racially diverse producers from entering the industry. Only 9.4% of producers are 35 or younger, 27% are new and beginning (with less than 10 years' experience), and 36% are female.[107] White producers account for 96% of our nation's farms.[108] Such extreme consolidation and lack of diversity raises grave concerns about disruption to the supply chain.

Intensive production systems—particularly livestock operations—produce high amounts of air, water, and greenhouse gas pollution. Concentrated animal feeding operations generate millions of tons of wet manure every year, which, if improperly managed, poses substantial risks to public health and the environment. Animal waste contains a number of potentially harmful pollutants including: (1) nutrients such as nitrogen and phosphorus; (2) organic matter; (3) solids, including the manure itself and other elements mixed with it such as spilled feed, bedding and litter materials, hair, feathers and animal corpses; and (4) pathogens (disease-causing organisms such as bacteria and viruses). Nutrient pollution from excess phosphorous and nitrogen can cause eutrophication of waterbodies, or significant increases in algae, which harms water quality, food resources and habitats, and decreases the oxygen that fish and other aquatic life need to survive.

Pollutants from CAFOs can infiltrate surface waters in a variety of ways including spills, other dry-weather discharges, overflows from storage ''lagoons," and improper "land application" where manure, litter, and other process wastewaters are spread onto fields controlled by CAFOs.

This scale of production is also associated with large, concentrated emissions of methane. Indeed, methane emissions from management of livestock manure and enteric fermentation account for almost 40% of total agricultural greenhouse gas emissions.[109] Not all operations contribute equally to this total – methane emissions are heavily concentrated in the largest CAFOs. For example, in 2017, 66% of milk cows in the U.S. were in the 6% of dairies with herd sizes over 500.[110] Thus, a few large facilities are responsible for the majority of methane emissions.

Intensive production of livestock is also associated with loss of native grasslands, which are converted to grow corn and soy for animal feed.[111] And this conversion leads to severe environmental and climate harms, including threats to essential inputs such as soil, which is lost

[106] *Id.* at 15.
[107] *Id.* at 27–30.
[108] *See* U.S. Dep't of Agric., Nat'l Agric. Stat. Serv., 2017 Census of Agriculture Race/Ethnicity/Gender Profile, United States Farms with White Producers, https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Race,_Ethnicity_and_Gender_Profiles/cpd99000.pdf.
[109] *See* EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2019*, Agriculture at 5-3, https://www.epa.gov/sites/production/files/2021-04/documents/us-ghg-inventory-2021-chapter-5-agriculture.pdf.
[110] *See* U.S. Dep't of Agric., Nat'l Agric. Stat. Serv., 2017 Census of Agriculture USDA 2017, https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_1_US/usv1.pdf.
[111] *See* Marcia DeLonge, *Reintegrating Land and Livestock Agroecological Solutions to Beef System Challenges* at 2 (2017), https://www.ucsusa.org/sites/default/files/attach/2017/11/reintegrating-land-and-livestock-ucs-2017.pdf.

during conversion, and pollinators that depend on native grasslands for habitat and access to resources.

D. Low Adoption Rates of and Support for Climate-Resilient Practices Limit Resiliency.

Several climate-smart practices with demonstrated benefits are available to increase crop resilience to the impacts of climate change, but these are not in widespread use. These include agroforestry practices, advanced nutrient management, conservation crop rotations, and cover crops. As described below, a large body of scientific literature, in addition to traditional knowledge and experience, supports the environmental benefits of these practices, making them excellent candidates for effectively and efficiently increasing carbon sequestration, reducing greenhouse gas emissions, and building climate resiliency. However, due to financial and technical barriers, adoption of some of the most effective climate-resilient practices remains low. The USDA should focus greater attention on incentivizing adoption of practices with the greatest benefit for building resiliency to climate change, while also supporting continued research on how to most effectively incentivize the adoption of these practices at scale across the nation. In particular, the USDA should increase the adoption of agroforestry practices, advanced nutrient management, diversified cropping rotations, and cover crops through the EQIP, the CSP, and the RCPP.

Despite their effectiveness, agroforestry practices currently receive only a small and often declining fraction of conservation funding. For example, funding for the National Agroforestry Center has averaged less than $1.5 million per year for the last decade. Furthermore, acreage funded for agroforestry practices was less than 1% of the nearly 13 million acres on active and completed contracts in EQIP in 2019, while less than 300 acres were funded for alley cropping and less than 3,000 acres were funded for silvopasture establishment.[112]

In contrast to dominant monoculture or low-diversity cropping systems, diversified conservation crop rotations and cover crops can help increase soil carbon sequestration by introducing a wider range of types of inputs into soil, maintaining soil cover throughout the year, and minimizing soil disturbance and erosion.[113] By building organic matter, these practices can also reduce the need for synthetic fertilizers, improve water quality, improve water retention and thus reduce the need for water inputs, and mitigate nitrous oxide emissions. In addition, these

[112] Based on sum of acres funded for alley cropping, riparian forest buffers, stripcropping, windbreaks, and silvopasture establishment. *See NRCS Conservation Programs Environmental Quality Incentives Program (EQIP)*, U.S. Dep't Agric., https://www.nrcs.usda.gov/Internet/NRCS_RCA/reports/fb08_cp_eqip.html.
[113] *See, e.g.*, Christopher Poeplauab & Axel Dona, *Carbon Sequestration in Agricultural Soils via Cultivation of Cover crops – A Meta-analysis*, 33 Agric., Ecosystems & Env't 200 (2015); Jinshi Jian et al., *A Meta-analysis of Global Cropland Soil Carbon Changes Due to Cover Cropping*, 143 Soil Biology & Biochemistry 107,735 (2020); *see also* R. Lal, *Soil Carbon Sequestration and Aggregation By Cover Cropping*, 70 J. Soil & Water Conservation 329 (2015); C. Tonitto et al., *Replacing Bare Fallows With Cover Crops in Fertilizer-Intensive Cropping Systems: A Meta-analysis of Crop Yield and N Dynamics*, 112 Agric., Ecosystems & Env't 58 (2006); Meagan E. Schipanski, *A Framework for Evaluating Ecosystem Services Provided By Cover Crops in Agroecosystems*, 125 Agric. Sys.12 (2014); Jason P. Kaye & Miguel Quemada, *Using Cover Crops to Mitigate and Adapt to Climate Change. A Review*, 37 Agronomy Sustainable Dev. 4 (2017).

practices can reduce the vulnerability of crops to pests and pathogens, thereby reducing the need for pesticides that are harmful to pollinators and water quality.[114] Similarly, cover crops significantly increase soil carbon by increasing carbon inputs from plants and reducing erosion.

While cover crop adoption rates have increased in recent years, their total rates of adoption remain low. Less than 5% of harvested croplands include cover crops.[115] There is thus a large opportunity to increase adoption of a practice with widely documented climate and environmental benefits. While EQIP-funded cover crop applications have increased, acreage enrolled in conservation crop rotations has fallen sharply in recent years. The USDA should set targets for increasing the adoption of cover crops and conservation crop rotations, substantially increase technical assistance and outreach, and continue to accelerate conservation funding for both suites of practices.

6. [No comments submitted related to section vi.]

7. Primary causes of risks for any aspect of the agricultural and food production supply chains assessed as vulnerable under subsection (v).

As described above in *section iv*, climate change is an overarching primary cause of risk to farmworkers, soil health, water quality and quantity, and pollinators. In particular, increased heat and extreme weather events pose health and safety risks to farmworkers. Additionally, poor worker protections and low rates of access to healthcare further endanger the health and wellbeing of farmworkers, who are on the frontlines of exposure to harmful pesticides and heat stress.

The conversion of land to accommodate expanding production, ongoing poor soil health practices on croplands, poor grazing practices on rangelands, and extreme weather events pose a risk to soil health. Climate change, over-fertilization, and pesticide use also pose a threat to water quality and quantity. Climate change, habitat conversion, and pesticide use also pose risks to pollinator populations.

Consolidation of the sector also poses grave risks. With only a small number of suppliers dominating all aspects of the sector, an issue with any one of them risks shortages all along the supply chain.

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[114] *See* Giovanni Tamburini et al., *Agricultural Diversification Promotes Multiple Ecosystem Services Without Compromising Yield*, 6 Sci. Advances 2020 eaba1715 (2020).

[115] 15,390,674 acres were planted to cover crops (excluding CRP) out of 320,041,858 harvested cropland acres. *See* U.S. Dep't of Agric., Nat'l Agric. Stat. Serv., 2017 Census of Agriculture – Table 47. Land Use Practices by Size of Farm: 2017 and 2012, https://www.nass.usda.gov/Publications /AgCensus/2017/Full_Report/Volume_1,_Chapter_1_US/st99_1_0047_0047.pdf ; *see also* U.S. Dep't of Agric., Nat'l Agric. Stat. Serv., 2017 Census of Agriculture – Table 1. Historical Highlights: 2017 and Earlier Census Years, https://www.nass.usda.gov/Publications/AgCensus/2017/ Full_Report/Volume_1,_Chapter_1_US/st99_1_0001_0001.pdf.

8. **Prioritization of the critical goods and materials and other essential goods and materials for the purpose of identifying options and policy recommendations.**

In determining policy priorities, USDA should recognize the need to advance social, economic, environmental, and climate justice together. USDA should choose those policies that achieve multiple goals and that protect clean air and a safe climate, clean water, healthy soil, pollinators, livelihoods, support for farmworkers, and support for BIPOC and socially disadvantaged farmers.

As we have explained in these comments, there are policy options available that can preserve all of these critical and essential goods and services. Agroecological practices—including those rooted in traditional indigenous knowledge—can build resilience to climate change; protect people, pollinators, wildlife and natural resources from pesticide and fertilizer pollution; sequester more carbon in U.S. soils; and build social, economic, and environmental justice. We urge USDA to invest in research and development needed to better understand and apply these practice and to provide education, training, technical support and financial incentives to increase adoption of these practices.

This will allow the U.S. food system to move away from its current highly industrialized, chemical-heavy, and unjust structure to one that is diverse, sustainable, fair, and resilient.

9. **Specific policy recommendations important to transforming the food system and increasing reliance in the supply chain for the sector.**

To transform the food system and increase resilience in the supply chain, we propose the following policy recommendations:

- The USDA should fund grants to enhance local and regional food and fiber infrastructure in response to changing climate conditions, to strengthen urban-rural connectivity, and to support the development of a resilient and equitable food economy, including for any of the following purposes:
    - To develop or upgrade aggregation, primary processing, cooling, and storage facilities for farm and fiber products, with a focus on regions that have insufficient capacity to meet the needs of farmers.
    - To develop or upgrade processing facilities and supply chain infrastructure in urban and rural areas, including those that could increase capacity when needed to support emergency food distribution.
    - To support the development of value-added processing of agricultural products that increase income and market opportunities for farmers and ranchers, including upgrades to producer or handler facilities to comply with organic certification requirements.
    - To develop or upgrade facilities that support the development and growth of new food and fiber businesses, including commercial or community kitchens and food and fiber processing, cooling, storage, and distribution facilities.

In awarding grants pursuant to this section, the USDA should prioritize projects that provide culturally relevant food access; projects that support job creation, training, and placement; and projects, such as food hubs and marketing cooperatives, that meet the supply chain and marketing needs of locally and regionally produced food and fiber products. The USDA should also award funds only to farmers, ranchers, nonprofit organizations, local governments, Tribal governments, and smaller scale businesses, including cooperatives.

- To enable the development of a flexible, decentralized meat processing system that offers good food jobs, fills infrastructure gaps, and ensures that smaller scale, sustainable producers are able to bring their animals to market and thrive, we recommend the USDA make grants available to:
  - Build, expand, or upgrade meat processing infrastructure for slaughter, cut and wrap, and value-added processing.
  - Develop mobile meat processing facilities that meet federal inspection and certification guidelines and can serve multiple meat producers.
  - Upgrade inspection protocols and data and communication hardware commensurate with a robust meat inspection service to enable interstate and intrastate sales of meat and poultry from state inspected plants.
  - Reimburse all or a portion of the costs associated with meeting federal inspection and certification requirements.

- To ensure a skilled and robust workforce, grants should also be provided to community colleges, universities, technical and vocational schools, Tribal governments, Tribal organizations, and educational institutions to provide workforce safety and development training for the meat and poultry processing industry, including to establish or expand career training programs in the meat and poultry processing industry and workforce development in humane slaughter for on-farm, fixed, and mobile systems operation, craft butchery skills, charcuterie arts, and meat processing inspection.

  The USDA should award these monies only to meat processing or Tribal businesses that have less than 150 employees and prioritize lower-income, disadvantaged communities[116] and Tribal nations.

- The USDA should provide grants to ensure communities and Tribes are able to obtain or produce foods that are healthy, nutrient dense, culturally relevant, reflect traditional

[116] Disadvantaged community in this instance is defined to mean a community located in a census tract in which the median household income of less than 80 percent of the area median income; a municipality with a population of 20,000 persons or less; a rural county, or a reasonably isolated and divisible segment of a larger municipality where the segment of the population is 20,000 persons or less, with an annual median household income that is less than 85 percent of the statewide median household income; a community located in a census tract in which the household income of at least 20 percent of the population is at or below the federal poverty level based on family size.

Native American foodways, and are locally or regionally grown, with a priority for climate-friendly production practices that includes certified organic. To ensure creative solutions and that key populations are served, such grants could be offered for projects between state departments of food and agriculture, in coordination with public health, aging, social services and others, who would work in partnership with nonprofit organizations, county, city, or tribal governments, tribal organizations, tribal entities, or producers. We recommend prioritizing projects with a high likelihood of being self-sustaining within a short period of time.

Examples of relevant projects include the development of year-round infrastructure for certified farmers' markets or tribe-operated farmers' markets on Indian Reservations (including equipment for wireless electronic benefits transfer); expanding support for community-supported agriculture programs, creating or expanding community food gardens in urban areas and on the urban fringe; purchase of land to support urban agriculture, especially prioritizing ownership by community or accredited land trusts; and construction of urban-edge agriculture parks to be leased as multiple small farms for sustainable farming to produce food.

In disadvantaged communities and areas without easy access to supermarkets or grocery stores, the USDA should support the creation or expansion of mobile produce markets, mobile farmers markets, mobile food carts for selling produce, and mobile food pantries.

- In order to ensure that climate-friendly agriculture is prioritized as supply chains are strengthened and that a new pipeline of local and regionally focused farmers and ranchers is able to thrive, we recommend the following policy interventions:
    - Grants for farmers and Tribal producers to increase soil organic matter, improve soil structure, and improve water and nutrient holding capacity, in a manner that will increase carbon sequestration and reduce emissions of greenhouse gases.
    - Grants for farmers and Tribal producers to improve water use efficiency through improved irrigation management, including surface and groundwater use efficiency measures. This is especially critical for producers in western states given increasingly frequent drought conditions.
    - Grants for farmers and Tribal producers to transition their farm operations to certified organic operations, including technical assistance to support farmers during a three-year organic farming transition period.
    - Grants to develop regional farmer training centers to provide culturally relevant assistance for farmers and ranchers. These grants are intended to primarily serve a disadvantaged community, provide assistance to beginning farmers and ranchers and/or farmworkers entering farm management to share agricultural and ecological knowledge, and maximize environmental, public health, and economic co-benefits to nearby disadvantaged communities.

- To better support farmers adopting climate-smart practices, to reduce reliance on a small number of concentrated and industrialized suppliers, and to diversify the supply chain, the USDA should use its procurement power to prioritize purchasing from sustainable providers. The federal government purchases billions of dollars' worth of food each year to feed children in schools, the military, veterans in hospitals, and others. Its purchasing power provides a tremendous opportunity to diversify the supply chain and to promote climate-smart practices that will improve resiliency up and down the supply chain. To accomplish this, the USDA should work with the White House to publish an executive order calling for a procurement preference from climate-smart producers, including organic producers, and ordering an amendment to the Federal Acquisition Regulation to codify this preference. The Executive Order on Ensuring the Future is Made in All of America by All of America's Workers provides a useful guide for how to implement such a preference.

- To protect the health and well-being of our agricultural workforce - without whom stable supply chains wouldn't exist - we recommend that the USDA invest in projects that prioritize housing and health. These include:
    - The development of multi-unit affordable housing for farmworker families and households, including, transit and transportation options, electric vehicle charging stations, shuttles to public transit or bus services, bus shelters, and benches. Such projects should be located near essential services, such as grocery stores, schools, and public libraries and include the development of broadband infrastructure if needed.
    - The development of food hubs, community centers, food stores, health care clinics, and child care centers proximate to farmworker housing.
    - The development of infrastructure to ensure that all farmworkers communities have safe and affordable drinking water as well as reliable wastewater treatment systems.
- We urge the USDA to provide grants and/or interest-free loans to develop food hubs serving public sector institutions like schools, universities, hospitals, prisons, and more. These aggregation and distribution centers will enable smaller-scale farmers and ranchers to participate in institutional supply chains. They are an essential intervention to increase the purchase of local, climate-friendly food and food produced by socially disadvantaged farmers and ranchers, increase economic stability for producers, support local farming economies, accelerate climate adaptation and resilience. USDA monies should fund projects that:
    - Incentivize the creation and permanency of public-serving food hubs, which could be founded by charter as a nonprofit organization or a Certified B Corporation.
    - Prioritize organic and other sustainable agricultural production practices, and fair labor practices;

- Serve small to mid-size farms or ranches, farms that are cooperatively owned, or owned by producers who are socially disadvantaged, beginning, limited resource, veterans, minorities, or disabled;
- Primarily serve public institutions such as schools.

10. Any executive, legislative, regulatory, and policy changes and any other actions to strengthen the capabilities identified in (iii), and to prevent, avoid, or prepare for any other contingencies identified in (iv).

To reduce the threat of climate change to the food and agriculture sector and thereby strengthen the supply chain's resilience to climate change, we recommend the following:

- The USDA should expand and improve the EQIP, the CSP, and the RCPP to increase support for climate-smart practices including agroforestry, advanced nutrient management, conservation crop rotations, and cover crops.
- The USDA should expand the CRP and CRP Grasslands to reduce the climate footprint of agriculture through increasing conservation lands.
- The USDA should incentivize climate-smart practices through conservation programs while reducing the share of conservation funding consumed by CAFOs.
- The USDA should establish clear and accountable climate and conservation benchmarks for cutting U.S. agriculture's environmental footprint in half by 2030.
- The USDA should revise crop insurance policies to reduce barriers to climate-smart practice adoption.
- The USDA should recognize reductions in reliance on pesticides as a climate-smart practice and increase research, education, outreach, and incentives for adopting reduced pesticide practices.
- The USDA should use its procurement power to advance food production that has lower GHG emissions. USDA should adopt a holistic approach to soil health rather than exclusively focusing on carbon storage.
- The USDA should expand funding for research on implementation and outcomes of climate-smart practices.
- The USDA should increase outreach and technical assistance related to climate-smart practices— facilitated through regional agroforestry centers, the Cooperative Extension System, Climate Hubs, and long-term agroecological research sites.

- The USDA should increase Research Funding for 1890 Land-Grant Institutions and Tribal Colleges to Better Understand Climate Impacts and Solutions for Historically Underserved Communities.

- Increase research and development and farmer pilots on high productivity practices that build climate-resiliency.

11. Proposals for improving the Government-wide effort to strengthen supply chains, including proposals for coordinating actions with outgoing efforts that could be considered duplicative of the work of EO 14017 or with existing government mechanisms that could be used to implement the EO. [No comments submitted related to section xi.]