

Transforming Agriculture in the Midwest

CRITICAL
RESPONSES TO
A CHANGING
CLIMATE



**A REPORT FOR THE
RE-AMP NETWORK**
December 2021

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To develop the recommendations in this report, project team members consulted and interviewed nearly 40 individuals with expertise in food systems, soil science, agro-economics, food worker organizing, current and historic farming practices, and more. While many of the contributors have deep expertise in agriculture and food systems work, the report uplifts the experience of those interviewed, and does not necessarily reflect positions taken by members of the project team. Interviewees are listed in APPENDIX 2 and are quoted with their permission.

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CHAPTER 1

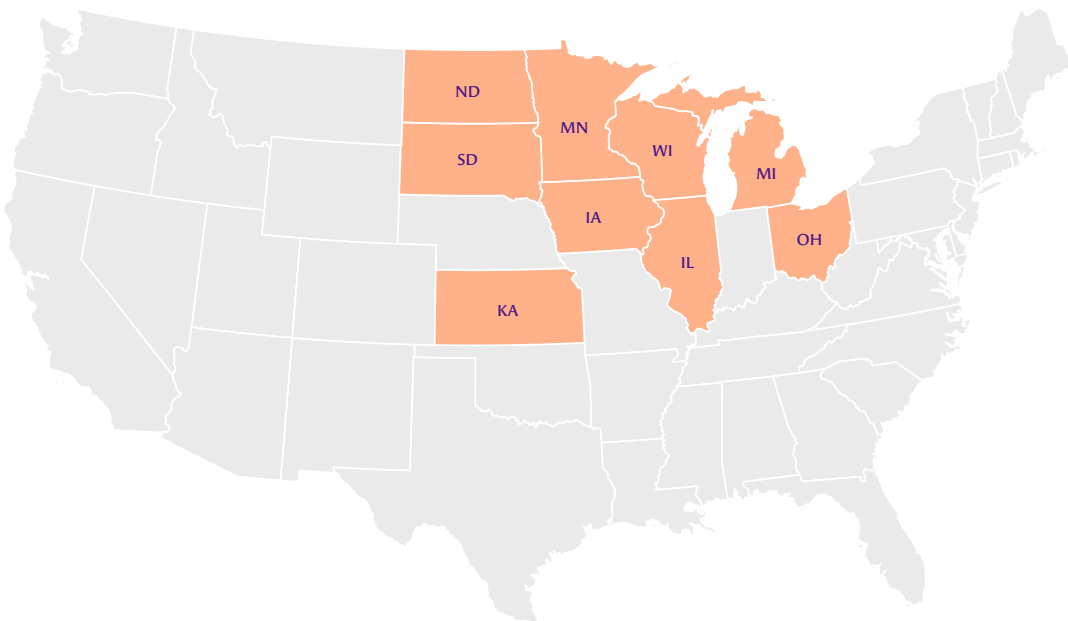
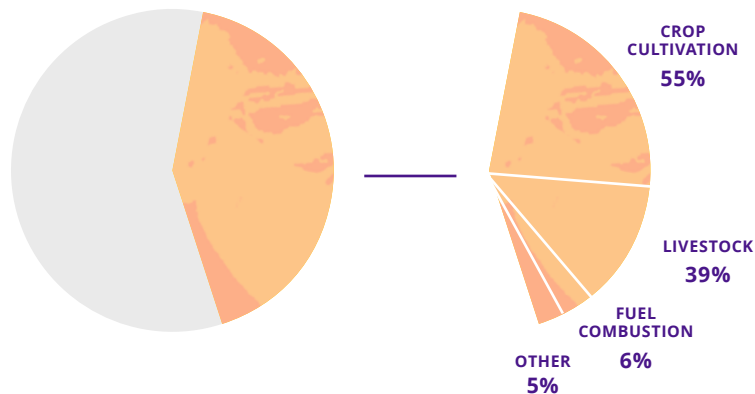
INTRODUCTION

Equitably reducing greenhouse gases from the agricultural sector in the nine RE-AMP Network states will require systems thinking and a set of values-based principles.

The Problem

The nine states that make up the RE-AMP Network (Illinois, Iowa, Kansas, Michigan, Minnesota, Ohio, North Dakota, South Dakota, and Wisconsin) have vast agricultural resources that disproportionately contribute to U.S. agricultural emissions. These states are responsible for 42 percent of these emissions (Rhodium Group, 2020), which is the equivalent of about 4.2 percent of U.S. emissions from all sectors. Most are in the form of nitrous oxide (N_2O) and methane (CH_4) and are generated by current soil and livestock management practices. The agricultural sector overall is responsible for over 10 percent (10.2 percent) of all U.S. greenhouse gas emissions. These are primarily derived from three sources: crop cultivation (55 percent), livestock (39 percent), and fuel combustion (6 percent) (U.S. Environmental Protection Agency, 2021).

Nine States
Account for
42%
of Agricultural
Emissions



Some Greenhouse Gases Are More Potent than Others

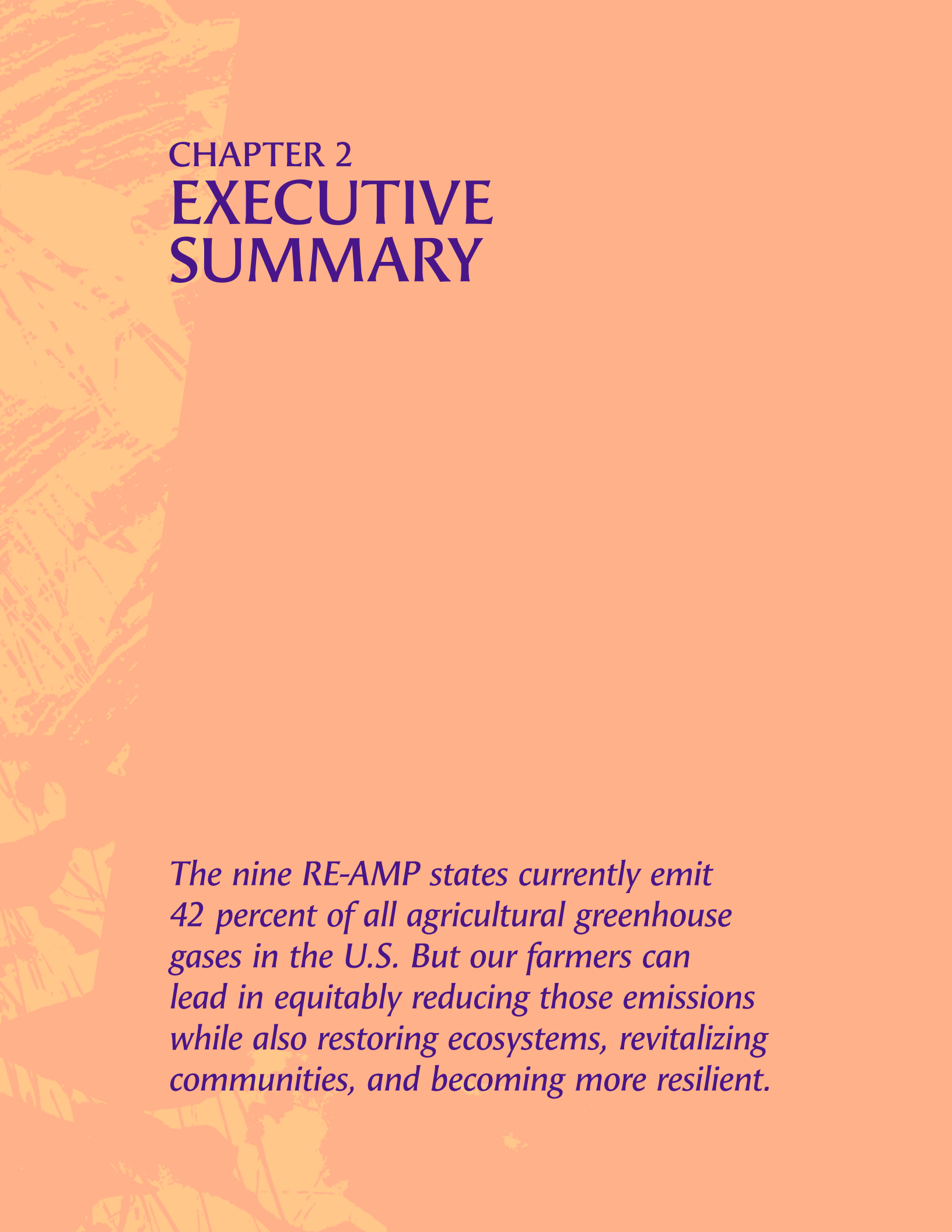
Conversations around greenhouse gas emissions often focus on carbon dioxide (CO₂), or CO₂ equivalents. This doesn't facilitate an understanding of the impacts that CH₄ and N₂O have on atmospheric warming. Methane, generated from livestock management, has a relatively short lifespan (12 years in the atmosphere). But pound for pound, it is 25 times greater than CO₂ over a 100-year period. Nitrous oxide generated from the way most soils are managed in the RE-AMP footprint is nearly 300 times that of CO₂, and its atmospheric lifetime is 114 years (U.S. Environmental Protection Agency, 2021). While CO₂ can stay in the atmosphere anywhere from 300 to 1,000 years (Buis, 2019), in the short-term, the warming potential of both CH₄ and N₂O far exceeds that of CO₂.

The significant contribution of CH₄ and N₂O by RE-AMP states to the warming of our planet is undeniable. Reducing emissions from agriculture can help RE-AMP states meet the Network's North Star Goal, while also playing a significant role in mitigating climate change nationally. The RE-AMP Network recognizes that meeting its North Star Goal and responding to the urgency of the climate crisis by actively engaging in actions that reduce emissions from agriculture is just as important as work taking place to reduce emissions from fossil fuels.

The mission of the RE-AMP Network is to set collective strategy and enable collaboration on climate solutions in the Midwest. Our North Star Goal is to equitably eliminate greenhouse gas emissions in the Midwest by 2050.

- RE-AMP NETWORK, 2021

	Carbon Dioxide CO ₂	Methane CH ₄	Nitrous Oxide N ₂ O
RELEASED VIA:	Combustion	Livestock Management	Conventional Soil Management
ATMOSPHERE:	300-1,000 years	12 years	114 years
SHORT-TERM RISK:		25 times CO ₂	300 times CO ₂



CHAPTER 2

EXECUTIVE SUMMARY

The nine RE-AMP states currently emit 42 percent of all agricultural greenhouse gases in the U.S. But our farmers can lead in equitably reducing those emissions while also restoring ecosystems, revitalizing communities, and becoming more resilient.

Purpose of the Report

The purpose of *Transforming Agriculture in the Midwest* is to develop an understanding of what actions could be taken in RE-AMP states to reduce greenhouse gas emissions from agricultural and food systems, to accelerate progress toward the Network's North Star Goal. It is meant for members, partners, and allies of the RE-AMP Network — many of whom have not yet engaged heavily in these areas, but increasingly see reducing emissions from agriculture and food systems as important ways to avert climate catastrophe.

Chapter 4, OPPORTUNITIES FOR TRANSFORMATION, describes how members and allies of the RE-AMP Network can engage in efforts to equitably reduce greenhouse gas emissions, while also exploring the many benefits that can result from these actions, including:

- Addressing historical inequities in our agricultural and food systems.
- Revitalizing rural communities affected by the trend toward larger, highly-mechanized farms, global supply chains, and ownership of farmland by entities in other countries.

- Improving ecosystem services, benefits provided by natural systems that contribute to making human life both possible and worth living. Plants, animals, fungi and micro-organisms provide food, wood, and other raw materials. But they also provide essential regulating services such as pollination, decomposition, water purification, erosion and flood control, carbon storage, and climate regulation; and cultural services, such as recreation and a sense of place.

“Those who work on climate have necessarily focused especially on the power and transportation sectors and know less about agriculture and its climate impact. And, those who work on agriculture don’t always consider how that sector impacts climate change and could be part of a set of solutions to decarbonize the economy. It’s past time to bring that work together.”

- AIMEE WITTEMAN, FORMERLY WITH
THE MCKNIGHT FOUNDATION

Need for a Systems Approach

Equitably eliminating greenhouse gas emissions in the Midwest by 2050 requires a systemic approach. This report draws on key elements of systems change to organize recommendations: mindsets, relationships and connections, power, practices, and policies. Taking a systemic approach requires understanding how the many parts of the agriculture and food systems are interconnected, and how they relate to other parts of the system. Within the systems explored in this report, there are numerous interdependencies:

- **The application of synthetic chemicals and mechanized tilling** — developed to increase farmer efficiency, profit, and yield — **have reduced the soil's ability to store carbon. This makes farms more vulnerable to extreme weather events** (healthy soils absorb water during heavy rain events, then release it to crops during drought). Floods can prevent access to farm fields, and both flooded fields and drought can decrease yields.
- **Fertilizers and pesticides also contribute to climate change.** When applied to the soil, fertilizers generate N_2O , a greenhouse gas that has far greater global warming potential than either CH_4 or CO_2 . When pesticides are manufactured, three primary greenhouse gases are emitted: CO_2 , CH_4 , and N_2O .
- In the Midwest, a significant amount of corn and soybeans are grown using synthetic fertilizers to produce ethanol and biodiesel, with the goal of producing cleaner-burning fuels. **As transportation becomes electrified, demand for these fuels may decrease.** This could pit farmers growing crops for fuel against others working to reduce greenhouse gas emissions from the transportation sector through electrification.

“We need to look at things from seed to waste, every step of the way. Only then can we get a picture of how much of an impact food is having on our environment.”

- JOSE OLIVA, HEAL FOOD ALLIANCE

- **Moving animals off the land and into concentrated animal feeding operations (CAFOs) increases greenhouse gas emissions (primarily CH₄) and pollution.** Putting animals in CAFOs also decreases grazing. Rotational, well-managed grazing of livestock can improve soil health, which increases its ability to store carbon.
- **Climate change affects access to healthy, affordable food** by disrupting food supply chains and reducing yields during extreme weather events. This, in turn, **raises prices for consumers.** Climate change is also linked with **decreased nutritional quality** of crops and the health and productivity of livestock.
- Access to healthy, affordable food is not equitable across the United States. Instead, it follows economic and racial delineations. **Inequitable food access exacerbates health and economic inequities.**
- Farmland in use today was taken by force or stolen through broken treaties from Native Americans. **Discriminatory lending practices, heirs' property laws, and systemic racism have intentionally limited land access for Black, Indigenous, and other farmers of color.** Efforts are underway at the federal level to redress these harms, and policies supported by RE-AMP members can ensure such efforts are adopted and implemented.

“We have a brittle agricultural system that is highly industrialized, dependent on fossil fuel-based inputs, and increasingly consolidated. It is not very resilient, not nimble, and not just. Food is wasted, yet more people are hungry. It isn’t serving small and medium farmers, and new farmers have a hard time starting and staying in business. And it’s not serving low-wealth communities of color who need access to good food.”

- RENATA BRILLINGER, CALCAN

These interdependencies (and numerous others) show how existing agriculture and food systems affect us all, but particularly communities of color.

Guiding Principles

This report includes recommendations for opportunities to transform the system, but also recognizes that the science around carbon sequestration through soils is nascent, and that solutions focused on technology or policy alone will become obsolete. For this reason, RE-AMP members who contributed to this report offer the following set of guiding principles to apply when evaluating whether strategies and solutions proposed by the public or private sector will meet the goal of equitably reducing greenhouse gas emissions from the agricultural sector:

1

ADDRESS SYSTEMIC INEQUITIES IN FOOD AND AGRICULTURAL SYSTEMS.

Honor culturally- and historically-relevant practices. Center farmers and impacted communities in conversations and decision-making about solutions to climate change. Recognize and address imbalances in power, and value and support labor across the food system with safe, fair, and humane conditions.

2

BENEFIT COMMUNITIES AND FARMERS.

Ensure equitable access to opportunities regardless of scale, geography, or demographics. Prioritize holistic benefits (ecological, economic, and social), and rebuild the social, economic, and environmental fabric of communities - including rural, peri-urban, and urban. Actively support communities and farmers over corporations.

3

HOLD A VISION THAT IS EXPANSIVE AND MULTI-FACETED, NOT MYOPIC AND LIMITING.

Balance the tools of today with vision of the future. Recognize that science around carbon sequestration on working lands (lands used for farming, grazing, or the production of forest) is nascent, but that it holds great promise to significantly contribute to overcoming the climate crisis.

4

DISRUPT THE STATUS QUO WHILE RECOGNIZING EXISTING VALUE.

Firmly and consistently reject tools and policies that enable the continuation of fossil fuels. This includes the use of synthetic fertilizers that generate potent greenhouse gases and offsets that allow polluters to buy their way out of their responsibility to reduce their own emissions. Programs for carbon payments must complement those of state and federal programs that provide holistic benefits, not supplant them.

5

CULTIVATE RELATIONSHIPS WITH PRODUCERS.

Farmers and ranchers are on the frontlines of climate change. Listen to and amplify the voices of producers driving climate solutions.

RE-AMP States Can Effectuate Positive Change

Reducing emissions from the U.S. agricultural and food system requires Midwestern states to play a central role. The nine-state footprint of the RE-AMP Network holds 45 percent of the country's cropland, 60 percent of the country's swine, and nearly 30 percent of the country's cattle (U.S. Department of Agriculture, 2017). Together, these states comprise 42 percent of agricultural emissions (Rhodium Group, 2020), but only 16 percent of the population of the United States.

Quantifying Climate Impacts

In 2019, agriculture in RE-AMP states was responsible for emitting the equivalent of 287 million U.S. tons of CO₂ (Rhodium Group, 2020). This is more than the combined emissions from the region's 58 highest emitting coal plants, in that same year (U.S. Environmental Protection Agency, 2019). These are notoriously high-emitting coal plants, which have an average nameplate capacity of 1260 MW and include heavy-hitters like: Monroe (MI); Gen J M Gavin (OH); Prairie State Generating Station (IL); Sherburne County (MN); Jeffrey Energy Center (KS); Walter Scott Jr. Energy Center (IA); Cardinal (OH); Coal Creek (ND); and Elm Road Generating Station (WI). While power sector emissions have gone down 39 percent since RE-AMP's baseline year of 2005, agricultural emissions have *increased* by 9 percent (Rhodium Group, 2020).

“Although it is dire, there is a heck of a lot of hope. Revising our food systems to make farmers more resilient is the answer to a lot of the issues.”

- JONATHAN LUNDGREN,
BLUE DASHER FARM

Opportunities for Transformation

Opportunities to shift agriculture in RE-AMP states from a high-emissions sector, with a highly extractive set of practices, to one that functions as a regional carbon sink are vast. By farming regeneratively to rebuild soils on some of the 248.9 million acres of farmland in our footprint (see Table 7, APPENDIX 1), farmers can put in place practices that scientists believe can help remove carbon from the atmosphere and store it in the soil.

Techniques that contribute to improved soil health include using organic, versus synthetic fertilizers; not tilling the soil; incorporating cover crops; diversifying and rotating crops; adding livestock to farms; and adding trees to pastures and croplands. Such techniques are gaining support through the U.S. not only because they can store carbon, but because they also slow erosion and produce healthier, more nutrient-dense food. When the use of fertilizers, herbicides, and pesticides are eliminated, these techniques also reduce air and water pollution; improve wildlife habitat and biodiversity; and can reduce farmer expenses after a few years, thereby increasing profit.

“The current situation is hopeful. We’re moving from a system where agriculture has been engineered primarily for yield, towards a regenerative system that restores soil health, human health, and community vibrancy.”

- REBEKAH CARLSON, NORI

Recent Federal Government Actions

Consistent with a “whole of government approach” on climate action, the Biden administration took bold steps on climate through agriculture in the first several months of its tenure, and is placing a sharp focus on climate and racial equity. This includes adding USDA programs that can reduce the threat of climate change, while also undoing historic discrimination against Black, Indigenous, and farmers of color engaged in food and agricultural systems. At the same time, there are multiple agriculture-focused climate bills being introduced or signed:

American Rescue Plan Act of 2021 ↗

Signed into law on March 11, 2021 the American Rescue Plan Act delivers historic debt relief to socially-disadvantaged farmers and ranchers. It requires the USDA to pay up to 120 percent of loan balances (as of January 1, 2021) for Farm Service Agency Direct and Guaranteed Farm Loans, and Farm Storage Facility Loans. Payments began June 2021 but a lawsuit alleging discrimination against white farmers has put the program on hold.

Justice for Black Farmers Act of 2021 ↗

Introduced by sponsors Senator Cory Booker (D-NJ) and Representative Alma S. Adams (D-NC) in February 2021, this Act, if passed by Congress, would address the history of racism against Black farmers and ranchers by requiring reforms within the USDA to prevent future discrimination. It also includes the issuance of 20,000 land grants consisting of up to 160 acres to eligible Black farmers each year to reverse decades of land loss.

“Prioritizing resources for farmers of color and for small and medium-scale farmers is critical. It will invert the economic incentives that typically flow the other way.”

- RENATA BRILLINGER, CALCAN

Agriculture Resilience Act of 2021 ↗

Companion bills were reintroduced by Senator Martin Heinrich (D- NM) and Representative Chellie Pingree (D-ME) in April, 2021. This legislation sets a roadmap to achieve net-zero emissions from agriculture by 2040 and gives farmers the tools and resources needed to improve soil health, sequester carbon, reduce emissions, enhance their resilience, and tap into new markets.

THRIVE Act ↗

Companion bills were introduced by Representative Debbie Dingell (D-MI) and Senator Edward J. Markey (D-MA) in April 2021. The Thrive Act is an economic recovery package that puts over 15 million people to work. It is designed to drastically cut climate pollution by 2030. The bills create opportunities for family, Indigenous, and Black farmers and ranchers, rural communities, and urban agriculture by disentangling the hyper-consolidated food supply chain. They also invest in local and regional food systems that support farmers, agricultural workers, healthy soil, and climate resilience.

Growing Climate Solutions Act of 2021 ↗

Companion bills were led by Senator Debbie Stabenow, Chair of the Senate Committee on Agriculture, and sponsored by Senator Mike Braun (R-IN) and Representative Abigail Davis Spanberger (D-VA). They build standard protocols and procedures for carbon payment programs, which reward farmers for adopting climate-smart practices. These bills require the USDA to ensure both financial and environmental benefits of carbon markets are equitably distributed to Black farmers and other farmers of color, farmers who rent their land, and farmers who run small-scale operations, all of whom can face barriers to participating in such markets.

Farm System Reform Act of 2021 ↗

Companion bills were introduced by Representative Ro Khanna (D-CA) and Senator Cory Booker (D-NJ) in July 2021. They strengthen the Packers & Stockyards Act to crack down on the monopolistic practices of meatpackers and corporate integrators, restore mandatory country-of-origin labeling requirements, and phase out concentrated animal feeding operations (CAFOs) — providing farmers the opportunity to transition to raising animals on pasture or to crop production. In July of 2021, President Biden signed an executive order directing the U.S. Department of Agriculture (USDA) to consider updating the 100-year-old Packers & Stockyards Act to address monopolies within the agricultural sector.

These actions, and others from the Biden administration and Congress, represent a major federal shift from policies of the prior administration and Congress, and provide significant opportunities to make progress on equitably reducing emissions from agriculture. Support for these bills should be based on the guiding principles found in Chapter 1, INTRODUCTION.

Key Report Findings

This report presents detailed information intended to provide RE-AMP members a thorough understanding of how current agricultural practices and food systems contribute to both climate change and racial discrimination and the myriad of opportunities that exist through mindsets, relationships and connections, practices, and policies, to shift to more just, resilient systems. Information about existing conditions in individual states can be found in the appendices. Members and allies are encouraged to use this report as a guide to discuss and bring about meaningful change in each of the nine states. Key findings of this report include:

- **In 2019, agriculture in RE-AMP states was responsible for emitting more than the combined emissions from the region's 58 highest emitting coal plants** (coal plants with an average nameplate capacity of 1260 MW). By farming regeneratively to rebuild soils on some of the 248.9 million acres of farmland in RE-AMP's footprint, farmers can significantly reduce these emissions.

- **Midwestern farmers have the potential to sequester approximately one-third of a ton of carbon per hectare of farmland each year (Lal, 2020). If just half of the 248.9 million acres in the nine RE-AMP states are farmed with techniques that sequester carbon, there is the potential to sequester 16,786,321 U.S. tons of carbon every year.** This is equivalent to:

- Closing just over one coal power plant the size of Prairie State, a 1,766-megawatt coal plant, every year. This plant, located in Marissa, Illinois, just 36 miles southeast of St Louis, Missouri, is the seventh largest carbon emitter in the country; or
- Removing 3.3 million passenger cars off the road each year. This represents about 18 percent of the total number of passenger vehicles registered in the RE-AMP footprint, and more than all the registered vehicles in the State of Michigan.

Note: These are provided as examples to indicate the scale of what is possible. They are not intended to provide a rationale for the continued use of fossil fuels.

“We have an unstable food system because of the inequities of who got what, when, and how.”

- DONNA MCCLISH, COMMON GROUND

- Farmers in RE-AMP states can be the champions needed to help avert climate disaster. Many already are leading the way, sharing their results with peers. For example, **23 percent of farmers in the RE-AMP footprint are implementing no-till practices that keep the soil structure intact.** This protects the soil from erosion by retaining crop residue. It also results in greater biological activity and water infiltration, increasing soil health and improving its ability to store carbon.
- Farming regeneratively not only can reduce greenhouse gas emissions and sequester carbon, but these practices also can:
 - **Lessen the loss of valuable topsoil** that occurs with erosion from degraded farmland, by improving soil health.
 - **Enhance water quality** when soils laden with synthetic chemicals no longer enter adjacent waterways.
 - **Restore biodiversity and increase wildlife** (including pollinators), when the use of chemical fertilizers are replaced with organic compost or manure from livestock.
 - **Produce higher-quality, nutrient dense food.**
 - **Increase farmer profit** through cost-savings (no need to purchase synthetic chemicals or till land), and more reliable yields during flood events and drought (healthy soils absorb water during heavy rain events, then release it to crops during drought).

- **Agrivoltaics** (“agriculture” and “photovoltaics”) **can reduce competition between energy development and agriculture by co-locating on the same parcel of land.** Agrivoltaics also can provide numerous other benefits, including lowering carbon emissions; improving yields for a variety of crops; minimizing water use; providing another source of income for farmers; and improving soil health, particularly when land is farmed regeneratively or when farmland around solar panels is planted with deep-rooted, native plants that rebuild soil and attract pollinators.

- Access to farmland in the Midwest is inequitable, which limits political and economic power for historically-marginalized communities. **Federal and state policies to equitably reduce emissions from the agricultural sector must address discrimination against Black, Indigenous, and farmers of color - including loans and land access constraints.**

- COVID 19 has highlighted how systemic racism and discrimination plagues the current agricultural and food systems. As RE-AMP states work to equitably reduce greenhouse gas emissions, **policies that provide access to land, loans, and credit to Black, Indigenous, farmers of color, and women should be prioritized. Also, raising wages, improving the health, safety, and well-being of workers who grow and harvest food and raise and process animals is essential** to end the discrimination against these workers, the majority of whom are immigrants.

“Our food system is geared to produce and distribute abundant food at low prices. As a result, marginalized communities often face poor nutrition... because they spend their food dollars on calorie dense foods, which are often highly processed and of low nutritional quality, or are meat products.”

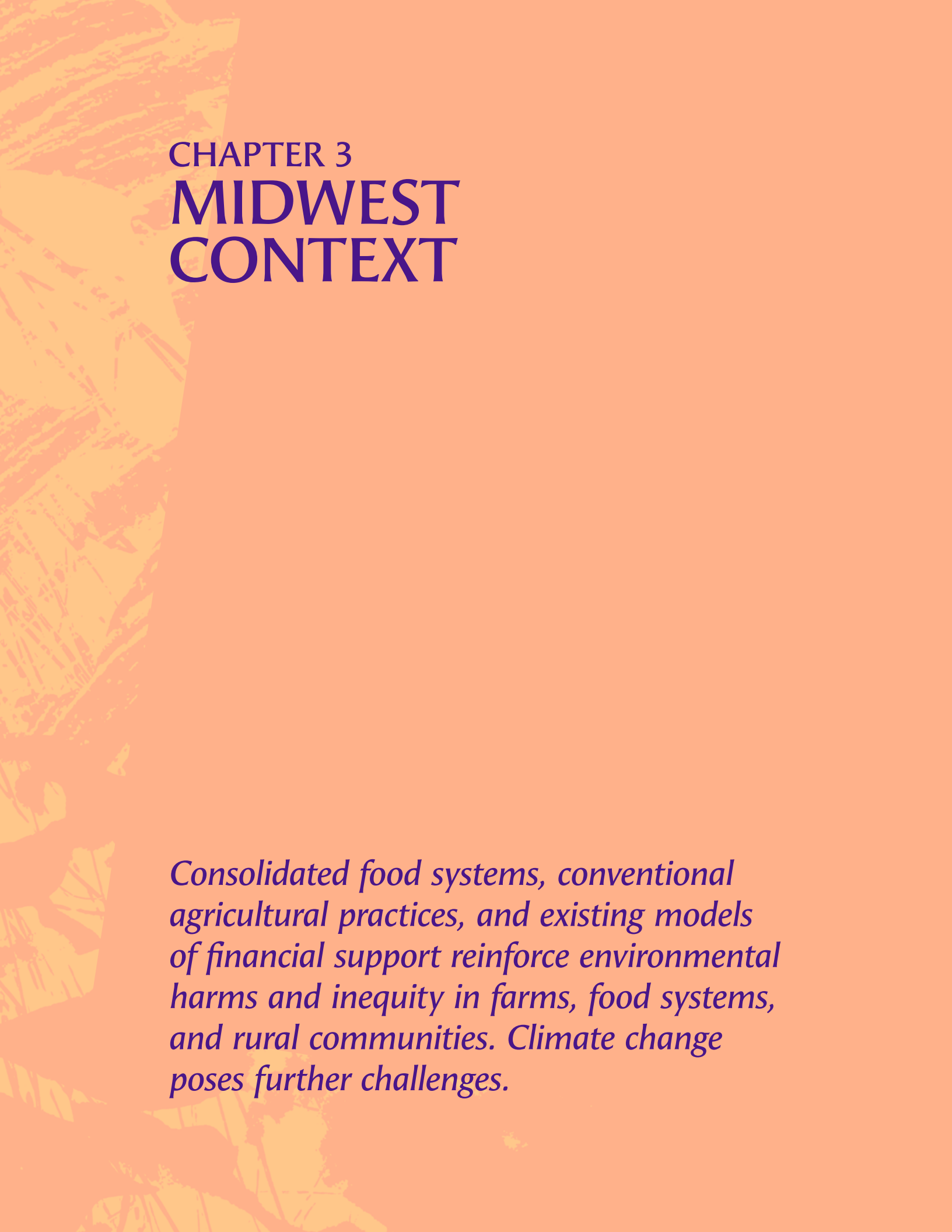
- WESLYNNE ASHTON, ILLINOIS INSTITUTE OF TECHNOLOGY

- Farmers and ranchers in RE-AMP states that produce food locally and regeneratively can **end food apartheid in communities of color and develop jobs** — creating niche markets that can provide people with healthy, affordable food, while also helping to revitalize rural, peri-urban, and urban areas.
- There is an opportunity to **modify farm subsidy programs** as part of the next Farm Bill (the current one expires in September of 2023) so that subsidies incentivize practices that build healthy soil and restore ecosystems by rewarding participating farmers. This change could **minimize farmer risk due to extreme weather**. It also **could slow farm consolidation**, which makes it difficult for young farmers and farmers of color to enter the profession.
- Modifications to federal food subsidy programs can **increase access to healthy food for children and adults** via the USDA's Child Nutrition Reauthorization Act and Farm to School Program; and the Supplemental Nutrition Assistance Program (SNAP), which is part of the Farm Bill.



Farmers markets help create demand for food produced locally and regeneratively

Photo 37625440 / Farmers Market © Teri Virbickis | Dreamstime.com.



CHAPTER 3

MIDWEST CONTEXT

Consolidated food systems, conventional agricultural practices, and existing models of financial support reinforce environmental harms and inequity in farms, food systems, and rural communities. Climate change poses further challenges.

Effects of Climate Change on Farmers in the RE-AMP Footprint

Farmers and ranchers in the Midwest are feeling the effects of climate change. Once known for its mild, predictable climate and long, growing seasons, today the Midwest is impacted by severe annual flooding, heat, and drought. Midwestern precipitation can persist from spring into summer, causing significant planting delays and slow the development of crops such as corn and soybeans. Wet springs are frequently followed by hot, dry weather during the growing season when farmers need the rain. And cold, wet, autumns often pose challenges during harvest.

Changed Weather Patterns

Today's weather patterns are no longer predictable. Extreme floods in 2019 stranded or drowned livestock; submerged valuable, unsold stored grain; and flooded farm fields. This flood event prevented Midwestern farmers from planting nearly 20 million acres of insurable crops. Most RE-AMP states were especially hard-hit (Newton, Prevent Plantings Set Record in 2019 at 20 Million Acres, 2019). This contrasts with the spring and summer of 2021, when much of the region experienced abnormally dry or drought conditions. Then, farmers and ranchers had to focus on potential reductions in crop yields and livestock productivity, due to the impact of dry conditions on both quantity and quality of forage. When drought occurs, ranchers often face critical decisions such as whether to reduce herd sizes, send cattle to feedlots, lease additional pasture, or purchase feed.

"I come to it as a farmer from seeing agriculture's impact on climate change which is directly connected to soil and crop cultivation. Agriculture has a role to play in climate change."

- TOM NUESSEMEIER, ORGANIC FARMER, LE SUEUR, MINNESOTA

Changes in Precipitation and Temperature

Changes in precipitation, along with rising temperatures by mid-century, are predicted by scientists. Without technological development, these changes are expected to reduce agricultural productivity in each of the nine RE-AMP states — plus Indiana, Missouri, and Nebraska:

- Flooding will continue to erode soils, which in turn, will degrade surface water quality as soil and nutrients from fertilizers are swept into water bodies and cause algal blooms.
- Warmer winters and higher humidity will create more favorable conditions for pests and pathogens.
- Extremely hot summers could push crops past optimal growing temperatures into the “reproductive failure” zone. Both corn and soybean are negatively impacted by extreme temperatures. Yields of both crops significantly decline when optimum growing temperatures are exceeded — temperatures above 84°F for corn and 86°F for soybeans (Feng, Oppenheimer, & Schlenker, 2013).
- Corn used in cattle feed will be more expensive, and poor harvests are expected to drive up prices.
- Hot weather will affect livestock, as animals tend to eat less and produce less milk, meat, or eggs (Intergovernmental Panel on Climate Change, 2018).

Farmers and Consumer Impacts

These changes in weather patterns and temperature not only affect the financial viability of Midwestern farmers and ranchers, but also food supplies. This, in turn, can raise prices for consumers (Intergovernmental Panel on Climate Change, 2018). Ironically, many of the practices developed to increase profit and yield, such as the application of synthetic fertilizers and tilling to keep the weeds down, also contribute to climate change. Many farmers in the RE-AMP footprint know they need to adapt.



Wisconsin farmer salvaging crops from flooded fields.

Photo courtesy of Chelsea Chandler, Clean Wisconsin.

The good news is that a growing number of farmers recognize the importance of rebuilding soil so that it stores water during flood events, releases water when the weather is dry, and potentially draws down and stores carbon that otherwise would contribute to climate change. In fact, in 2017, 23 percent of the farmers in the nine RE-AMP states had adopted no-till practices on over 50 million acres, or 20 percent of the total acres in farms. This practice not only improves soil health, but also reduces annual fuel and labor costs. The percentage of farmers in the nine RE-AMP states practicing no-till was higher than farmers in the U.S. as a whole (See Table 1, APPENDIX 1).

Similarly, farmers in RE-AMP states are beginning to see the benefit of planting cover crops as a way to slow runoff from rain and snowmelt, and reduce loss of valuable farmland due to sheet and rill erosion. Over time, a cover crop regimen will increase soil organic matter, leading to improvements in soil structure, stability, and increased moisture and nutrient holding capacity for plant growth. In 2017, nearly 10 percent of all farmers in the RE-AMP footprint planted cover crops on 5.5 million acres of farmland. While this represents just two percent of the total acres in farms in the nine RE-AMP states, it shows farmers are beginning to see the benefits of moving forward with techniques that improve soil's ability to sequester carbon, provide essential ecosystem services, and help mitigate climate change (See Table 1, APPENDIX 1).







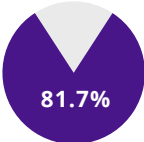
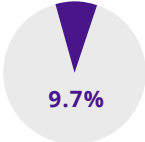

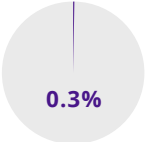
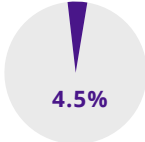
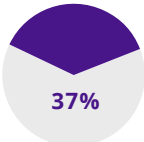
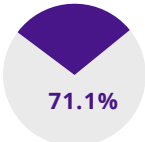
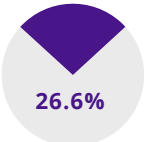
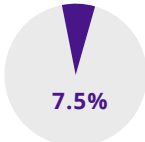
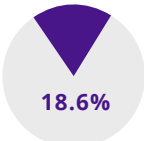
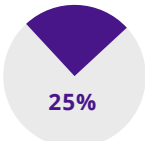
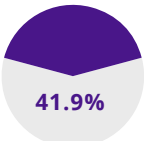
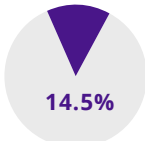
Todd and Arliss Nielsen, Wright County, Iowa, think their no-till and ryegrass cover crop combination is building organic matter, and may eventually reduce the amount of nitrogen they need to apply.

NRCS photo by Lynn Betts, via flickr.

Farm Size and Profitability in the Midwest

Most (about 91.4 percent) farms in the RE-AMP footprint are classified as small or mid-sized family-owned farms. Farmers in these two classifications operate approximately 66 percent of the total acres in farms (U.S. Department of Agriculture, 2021) (See Table 2a, APPENDIX 1, to find information by state.) Farmers in these two classifications also face the greatest pressure to compete with the large and very-large farms that benefit most from current policies. For many, farming remains a way of life, and not just a job. Over the years, policies that once supported family farmers have been replaced by those that support agribusiness.

Table 2
FARM SIZE, BY GROSS CASH FARM INCOME (GCFI)
RE-AMP Footprint, 2017

	FAMILY-OWNED FARMS				NON-FAMILY FARMS
	 SMALL <i>Under \$350,000</i>	 MIDSIZE <i>\$350,000-\$999,000</i>	 LARGE <i>\$1,000,000-\$4,999,999</i>	 VERY LARGE <i>Over \$5,000,000</i>	<i>Any farm where the principal operator and persons related to the principal operator do not own a majority of the business</i>
FARMS	 81.7%	 9.7%	 3.9%	 0.3%	 4.5%
LAND	 37%	 71.1%	 26.6%	 7.5%	
PRODUCTION	 18.6%	 25%	 41.9%	 14.5%	

Source: Farm Typology (U.S. Department of Agriculture, 2019) See details for RE-AMP states, Tables 2a - 2c, APPENDIX 1

Financial Performance

Larger farms are more likely to be profitable than small farms, reflecting economies of scale in farming and the government subsidies they receive. Multiple years of low commodity prices and delayed distribution of disaster assistance relief, followed by a global pandemic, resulted in farmer bankruptcies in 2020 that were the third highest over the past decade. The RE-AMP states of Wisconsin, Kansas, Iowa, and South Dakota were among states hardest hit (Newton, *Farm Bankruptcies During 2020, 2021*).

Most small farms in the U.S. (between 62 and 91 percent, depending on farm type) had an operating profit margin¹ in the “red zone” in 2019, indicating higher risk of financial problems. However, what is not reflected in these statistics is that some of these farms don’t consider farming as a primary occupation — meaning they generate income from other sources not reflected in USDA statistics. They can build wealth through their assets, unlike farmers who lease land who are more likely to be farmers of color (Horst, 2019). A steady rise in land values makes it prohibitively expensive for farmers of color to break into agriculture, thus maintaining the white-dominance of farming and land-ownership (McGinnis, 2021).

¹ *Operating profit margin (OPM) = 100% X (net farm income + interest paid - charge for operator and unpaid labor - charge for management) / gross farm income. OPM is based on both cash and noncash items.*

What Farmers are Growing in the Midwest and Why it Matters

Seventy-five percent of the arable land in most of the RE-AMP states is dominated by just two crops — corn and soybeans. These are primarily produced for fuel and livestock feed in the U.S. and abroad. Together, all nine RE-AMP states generated 63 percent of all the corn and 62 percent of all of the soybeans produced in the country. Iowa and Illinois alone generated nearly one-third of the corn and 30 percent of soybeans produced in the U.S. (U.S. Department of Agriculture, 2020). See Table 3, APPENDIX 1, for information by state.

The predominance of these commodity crops is the result of agricultural policies of the 1970s, when farmers were encouraged to overproduce to meet newly emerging markets overseas. But overproduction is expensive and ecologically harmful. It also pushes down prices, which hurts the farmer.



More than 50 percent of the N_2O emissions from the U.S. agriculture sector are generated by the nine-state RE-AMP region. This is due to the application of fertilizers on crops.

Photo by Bill Meir, via flickr.

Conventional Farming Dominates Midwest Agriculture

Corn, soy, and other commodity crops grown in the RE-AMP footprint are typically produced with what is referred to in this report as “conventional farming,” the prevailing agricultural system in the Midwest. This system has delivered tremendous gains in productivity and efficiency over the past 50 years. Conventional farming systems vary from farm to farm, but they share many of the same characteristics, including: large capital investments in equipment and technology; uniform high-yield hybrid crops; dependency on agribusiness; mechanization of farm work; and extensive use of fossil fuels in the form of pesticides, fertilizers, and herbicides.

However, the increased efficiency and productivity come with great costs to our climate, environment, soil health, and communities:

- Tilling and the application of synthetic chemicals results in the loss of carbon from our soils. Carbon is the main component of soil organic matter and helps give soil its water-retention capacity, its structure, and its fertility — making it possible to sequester carbon from the atmosphere.
- Conventional farming reduces biodiversity when large fields are planted with single crops. It also contributes to poor air quality from tilling, and wind erosion when fields are left bare; depletes Midwestern aquifers; and, when chemicals are applied, pollutes waterways and destroys wildlife habitat.
- The manufacturing of chemical fertilizers, herbicides, and pesticides requires high amounts of energy. Significant amounts of energy are also required to fuel mechanical equipment (e.g., drying grain, tractors, and trucks). Under the current system, these energy requirements are most often met with greenhouse-gas emitting fossil fuels.
- Farmworkers and owners face a myriad of health risks from exposure to pesticides; and pesticides, nitrates, and phosphorus impact ground and surface water quality, affecting both urban and rural communities.
- Planting fields with commodity crops for animal feed or fuel, rather than food, does not provide healthy, local food for communities — which otherwise could help improve access to healthy food for communities experiencing food apartheid, and boost economies by keeping dollars local.
- This system now resembles the fossil fuel industry, which extracts value out of the ground, while contaminating the air, water, and land; and leaves greenhouse gas pollution in its aftermath.

Nitrous Oxide Emissions from Crop Cultivation

Over half (52 percent) of N_2O emissions from the country's agricultural sector come from the RE-AMP nine-state region. Nitrous oxide emissions tend to be highest in the Midwest where a large portion of the land is used for growing synthetically-fertilized corn and soybean crops. This is significant, not only because of the quantity of emissions released, but also, because pound for pound, N_2O is nearly 300 times more powerful than CO_2 . Nitrous oxide remains in the atmosphere for an average of 114 years before being removed by a sink or destroyed through chemical reactions (U.S. Environmental Protection Agency, 2021).

How Much Carbon Could be Sequestered?

In 2019, agriculture in RE-AMP states was responsible for more emissions than the combined emissions from the region's 58 highest emitting coal plants (coal plants with an average nameplate capacity of 1260 MW). By adopting farming practices that rebuild soils on some of the 248.9 million acres of farmland in RE-AMP's footprint, farmers can greatly reduce those emissions while also potentially removing carbon from the atmosphere and storing it in the soil.

According to soil scientist Rattan Lal, Midwestern farmers have the potential to sequester about one third of a ton of carbon per hectare of farmland each year. If just half of the 248.9 million acres of land in farms in the nine RE-AMP states are farmed with techniques that sequester carbon, there is the potential to sequester approximately 16.7 million U.S. tons of carbon every year. This is equivalent to:

- Closing just over one coal plant the size of Prairie State every year. Prairie State, a 1,766 megawatt coal plant located just 36 miles southeast of St Louis, Missouri, is the seventh largest carbon emitter in the country; or
- Removing 3.3 million passenger cars off the road each year. This represents about 18 percent of the total number of passenger vehicles registered in the RE-AMP footprint, or more than all the registered vehicles in the state of Michigan.

Note: These examples are provided as examples to indicate the scale of what is possible. They are not intended to provide a rationale for the continued use of fossil fuels.

Emissions from the Food System

Emissions from the agricultural sector do not include those associated with our larger U.S. food system. Total emissions from our food system is hard to estimate, but recent studies suggest that the production of food and emissions from processing, transportation, packaging, and disposal in the U.S. represent about 25 percent of the country's total carbon footprint (Crippa, Solazzo, Guizzardi, Monforti-Ferrario , & Leip, 2021).

Climate Impacts of Raising Livestock

Over 22 percent of the agricultural land in the RE-AMP footprint is pasture or rangeland, used primarily for beef cattle and dairy cows. Many of these lands are in the states of Kansas, North Dakota, and South Dakota. See Table 4, APPENDIX 1.

According to the U.S. Environmental Protection Agency, enteric fermentation (microbes decomposing and fermenting plant matter as part of the digestive process) from ruminants accounts for 25 percent of emissions from the agricultural sector, and manure management accounts for 12 percent of total greenhouse gas emissions from agriculture, or 37 percent of the total emissions from country's agriculture sector (U.S. Environmental Protection Agency, 2021). RE-AMP states contribute 27 percent of all U.S. agriculturally-derived methane (Rhodium Group, 2020).



Livestock in the RE-AMP footprint area responsible for 27 percent of all U.S. agriculturally-derived CH₄. (The Rhodium Group).

Midwestern Feedlot by Kansas State Extension, via flickr.

Concentrated Animal Feeding Operations

While some livestock are grazed on pasture or rangeland in the RE-AMP footprint for all or most of their life, the raising of hogs, cattle, and poultry in CAFOs has steadily increased over the years. This is because producers are looking to greater efficiencies to reduce their costs, while also meeting the growing global demand for meat and poultry. Unfortunately, these “efficiencies” have increased greenhouse gas emissions.

To keep up with the demand for meat, the number of CAFOs in the RE-AMP footprint increased from 5,000 in 2011 to over 7,000 CAFOs in 2019. By 2019, 35 percent of the total CAFOs in the U.S. were in the RE-AMP footprint. Iowa and Minnesota ranked #1 and #3, respectively, in the country (U.S. Environmental Protection Agency, 2020). See Table 5, APPENDIX 1.

“From 1910 to 2008, per capita meat consumption in the U.S. increased 55 percent. People used to eat very little chicken, it was a luxury. Now, chicken has really taken off because it is cheaper, and the perception is that it is healthier. Pork consumption has stayed about the same over the past century. As people become more affluent, meat consumption increases. The industry uses this as justification for the CAFO model: producing more meat on less land.”

- DON STULL, PROFESSOR EMERITUS,
ANTHROPOLOGY, UNIVERSITY OF KANSAS

Impacts of Animal Waste from CAFOs

Shifts toward larger dairy cattle and swine facilities over the last several decades have resulted in an increased use of liquid manure management systems, which have higher potential CH_4 emissions than dry systems. The impact of one pound of CH_4 on warming the atmosphere is 25 times greater than CO_2 over a 100-year period (U.S. Environmental Protection Agency, 2021).

Closer to home, water quality is critically degraded by CAFOs. Many Midwestern lakes and waterways no longer are swimmable, fishable, or safe for other forms of recreation. Toxic algal blooms frequently occur in the Great Lakes, particularly in Lake Erie; Green Bay, Lake Michigan; and Saginaw Bay, Lake Huron. Climate change and weather-related disasters exacerbate this problem when intense rain occurs in areas where CAFOs are located, and manure lagoons overflow into neighboring fields, drainage areas, and nearby rivers, lakes and streams, wreaking havoc on natural ecosystems.



Harmful Algal Bloom in Western Basin of Lake Erie: September 20, 2017.

Aerial Associates Photography, Inc. by Zachary Haslick. NOAA, [via flickr](#). Public Domain.

Depositing manure on pasture instead of storing it in lagoons would reduce CH_4 emissions from livestock and manure management. While enteric fermentation will continue to contribute to CH_4 emissions, studies have shown that access to high quality pasture and forage, combined with rotational management-intensive grazing systems, can reduce CH_4 emissions, reduce pasture runoff, improve manure distribution, and enhance quality of forage (Brown, 2018).

How Financial Supports and Structures Contribute to Climate Change and Inequities

Farm subsidies are intended to help agricultural producers manage the variations in agricultural production and profitability from year to year that results from variations in weather, market prices, and other factors, while also ensuring a stable food supply. The USDA identifies the primary subsidies under the 2018 Farm Bill as:

- **Crop Insurance.** The Federal Crop Insurance Program (FCIP) indemnifies producers against losses in yield, crop revenue, margin, whole farm revenue, and other types of losses. FCIP is administered by the Federal Crop Insurance Corporation (FCIC). Under FCIP, private-sector insurance companies sell and service the policies, while USDA's Risk Management Agency (RMA) approves the premium rates, administers premium and expense subsidies, approves and supports products, manages FCIC, and reinsures the companies. RMA also develops new crop insurance policy offerings to farmers, sometimes in collaboration with private-sector insurance companies.
- **Commodity Programs.** Federal farm commodity programs have been making payments directly to farmers based on either current or historical agricultural production for decades. There are three main commodity programs: Price Loss Coverage; Agriculture Risk Coverage; and the Marketing Assistance Loan Program. As agricultural production has shifted to farms with larger sales, so, too, has the distribution of commodity-related program payments.
- **Conservation Payments.** These payments represent the largest single federal source of funding for private land conservation. Three primary programs help agricultural producers improve their environmental performance with respect to soil health, water quality, air quality, wildlife habitat, and greenhouse gas emissions via financial and technical assistance. These are the Conservation Stewardship Program (CSP); the Environmental Quality Incentive Program (EQIP); and the Conservation Reserve Program (CRP).

The CSP requires the Natural Resources Conservation Service to set aside five percent or more of the acres enrolled in CSP for socially disadvantaged producers. This helps address some of the inequalities associated with agriculture by

providing opportunities to farm. Changes to the CRP program made by the USDA in 2021 include higher payment rates to boost enrollment, new incentives, and a more targeted focus on the program's role in mitigating climate change (U.S. Department of Agriculture, 2021).

Subsidies Are Skewed toward Commodity Crops

The basic intent of subsidies is to make up the difference between the market price for a crop and the price that a farmer needs to survive. Except for conservation payments, support provided to farmers is highly skewed toward commodity crops, including the two major crops (corn and soybeans) grown in RE-AMP states. This is because commodity crop farming is a low-margin business, and it doesn't take a huge drop to put a farmer on the brink of bankruptcy.

Subsidies are not consistent across production. During the five marketing years of 2014 through 2018, just six crops (corn, wheat, soybeans, peanuts, cotton, and rice) accounted for an estimated 92 percent of farm commodity program payments (Schnepf, 2019). Producers of meat, fruit, tree nuts, and/or vegetables can only benefit from crop insurance and disaster relief. Dairy producers have separate price and market controls that are highly regulated. Farmers and ranchers who raise meat and dairy benefit, indirectly, from farm subsidies that support the production of corn and soybeans for animal feed.

Subsidies Favor Large Farms

As it currently exists, the farm subsidies system leaves out the majority of farmers. Most farm subsidies are based on gross sales and acreage, and most payments are directed to large farms. Seventy-one percent of all farms did not receive any farm-related government payments in 2018 (U.S. Department of Agriculture, 2019). This practice of rewarding the largest farms supports monocropping operations that use intensive farming practices such as chemical fertilizers, herbicides, and pesticides that take a toll on our land and water. Subsidies encourage the consolidation of farms because smaller operators know they can take advantage of government subsidies if they are larger. Fewer and larger farms mean less money is circulating in local economies, fewer farm jobs for rural areas, and reduced opportunities for beginning and young farmers to farm.

Federal Crop Insurance Program

More than any other program, the Federal Crop Insurance Program keeps large-scale commodity farmers reliant on government payments, rather than helping them build more innovative business models that could improve farm resilience to extreme weather and increase long-term profitability (Lafave, Sierks, & Renton, 2020). This is because:

- The government subsidizes 62 percent of crop insurance premiums paid for by farmers. Just 38 percent is paid for by farmers.
- Eighty-four percent of farmers covered by crop insurance opt into revenue protection plans, which cover both crop loss and revenue loss.
- During extreme weather events, farmers can receive payment when they are unable to plant an insured crop, as planned — without increasing their deductibles. Extreme floods in 2019 prevented farmers in the Midwest from planting nearly 20 million acres of insurable crops (Newton, Prevent Plantings Set Record in 2019 at 20 Million Acres, 2019).
- Crop insurance does not require farmers (or offer them incentives) to protect farmland that could not be planted with crops because of extreme weather. These acres will be more susceptible to erosion and degradation if they are left exposed to the elements, which can make them prone to more losses in the future.

Crop Insurance Discourages Sustainable Farming

Crop insurance can discourage farmers from diversifying their crops and adopting practices that build healthy soil as a strategy to minimize risk. This is counterintuitive, because implementing practices that build healthy soils can help farms better withstand the disasters that necessitate crop insurance payments to begin with. Healthy soil holds more water (by binding it to organic matter), which can reduce flooding. Healthy soil also loses less water to runoff and evaporation, and can sustain crops during dry spells during the growing season.

There is an opportunity to modify farm subsidy programs as part of the next Farm Bill (the current one expires in September of 2023), so that subsidies incentivize or reward practices that build healthy soil and restore ecosystems by rewarding participating farmers. This change could minimize farmer risk. It also could slow farm consolidation, which makes it difficult for young farmers and farmers of color to enter the profession.

Carbon Payment Mechanisms

For many farm operators, farming already is a risky undertaking. Methods of compensating farmers willing to make changes on behalf of the public good via carbon payment mechanisms are gaining traction among those seeking to reduce carbon emissions and compensate farmers for carbon reduction services. But 15 years of carbon market attempts in the US have not yet delivered the resources needed to support farmers.² Any support for such programs should follow the guiding principles listed in Chapter 1, INTRODUCTION.

Specific concerns related to carbon payment mechanisms, as they currently exist, include:

- **Measurement tools are inadequate.** The tools to measure soil carbon to the degree of accuracy and reliability that a market would require do not currently exist.
- **Impermanence.** Carbon sequestered in the soil can be released back into the atmosphere with a change in land management practices, or through severe weather events.
- **Undermines holistic solutions.** Paying farmers for soil carbon offsets treats agricultural land narrowly as a carbon sink. Production for local food systems becomes a secondary function of farmland.

“I wonder if we’re going too far down a reductionist path that’s all about carbon. We need to think about the multiple benefits we can receive from a well-managed agricultural landscape – wildlife, carbon, jobs, community benefits, etc.”

- MARK MULLER, REGENERATIVE AGRICULTURE FOUNDATION

² See: California carbon market (includes dairy digesters that only work for the largest dairies), Chicago Climate Exchange (the market signed up over 3 million acres of farmland and collapsed in 2010 leaving farmers without payment for the practices they implemented).

- **Doesn't Address Equity.** Many in the Environmental Justice community are against agricultural carbon markets as a climate solution, because they do not address the systemic inequities in food and agricultural systems.
- **Carbon markets primarily benefit large-scale farms.** This raises concerns that corporate investment in carbon markets will contribute to further consolidation of agricultural land and, therefore, disadvantage small- to mid-sized and minority farmers.
- **Greenwashing.** Carbon markets allow corporations to purchase offsets that are based on shaky science and buy their way out of their responsibility to reduce their own emissions. Ecosystem payment programs that are not based on generating offsets could avoid this.

Despite uncertainty about the science, carbon markets and payment programs are being proposed and piloted in private markets. There are better approaches for incentivizing farmers to adopt practices that boost resilience and sequester carbon, such as public investments in working lands conservation programs and many of the other recommendations presented in Chapter 4, OPPORTUNITIES FOR TRANSFORMATION.

The Impact of Farm Consolidation in the Midwest

The increase in the average size of farms in the RE-AMP footprint was over 10 percent from 2010 to 2020, consistent with patterns that have been taking place for decades (U.S. Department of Agriculture, 2011), (U.S. Department of Agriculture, 2021). See Table 7, APPENDIX 1. This increase in average farm size is primarily due to consolidation, which happens when farmers of large farms acquire land that formerly belonged to smaller ones. Some of that is incentivized by government subsidies. Larger farms tend to realize better financial returns as they can make more intensive use of labor and capital resources. This steady shift of acreage and production to larger operations applies to both crop and livestock commodities.

Consolidation Is Happening Fastest in the Midwest

A 2021 report shows that farm consolidation has occurred more rapidly in the Midwest than in the rest of the country³. Over a 40-year time frame, mid-size crop farms in the Midwest (50-1,000 acres) shrank to just half of their former number and acreage (Union of Concerned Scientists, 2021).

Farm consolidation hurts rural communities. Consolidation comes primarily at the expense of mid-size farms, the economic backbone of these communities, shrinking rural wealth. It also reduces opportunities for new farmers, who are finding it increasingly difficult to farm, and has hit Black and Indigenous farmers especially hard. These farmers already are fighting an uphill battle against multiple barriers imposed by structural racism.

“Regeneration starts with the soil, but it’s more than that. It’s regenerating our rural areas which have been lost and taken from us, the communities that sit in these areas, our own bodies and souls.”

- GRAHAM CHRISTENSEN, GC RESOLVE

³ This report considered Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin to be Midwestern states.

Farmland Prices Rising in the Midwest Increases Barriers for Farmers

To further complicate and compound this trend, farmland prices are currently rapidly climbing across the Midwest, fueled by a recent rally in grain markets and low interest rates. Farmland values increased during 2020 as higher grain prices buoyed revenue for farmers. Land prices in parts of the Midwest vary, but increases from January 2021 through June 2021 in RE-AMP states ranged from 9 to 15 percent (McGinnis, 2021). Coupled with farm consolidation, the rise in farmland price increases barriers for young farmers and Black, Indigenous, and other farmers of color who want to enter the profession.

When small- and mid-sized family-owned farms are consolidated to become part of large or very-large farms owned by investors outside the community, rural communities suffer. Jobs disappear, population shrinks, physical and social infrastructure weakens.

Structural Barriers to Achieving Equity in Farming

Women, young, Black, Indigenous, and other farmers of color face structural barriers — including racism and discrimination — when attempting to access land and obtain access to credit and loans when needed to hold on to their properties during hard times. See Table 8, APPENDIX 1, for a summary of farmers by race, ethnicity, gender, and age. The following describes some of those barriers.

Midwestern Farmers are Growing Older

In 2017, the most recent year data is available, the average age of farmers was 57.5, but 34 percent were 65 years and older. In 2017, just eight percent of all farmers were younger than 35. The proportion of new farmers in the RE-AMP footprint fell from 16 to 11 percent from 2012 to 2017 (Ferguson, 2021).

Barriers Exist that Keep Young Farmers Out

With more farmers and ranchers reaching retirement age, young people willing to enter this profession are urgently needed. However, there are many barriers that keep this from happening. These include: student debt, difficulty in finding affordable land, challenges navigating USDA and other agricultural programs for loans and grants, and the need for training and technical assistance.

With all these obstacles, young people are choosing other professions that have less risk and minimal to no start-up costs and are perceived to be more challenging than conventional farming. This results in “brain-drain” in rural communities, as young people leave communities whose economies are dominated by commodity crops.

Need to Make Room for Women

Sixty-four percent of all farmers are male. The numbers of female producers are rising (now 36 percent), but farming remains a disproportionately male profession (U.S. Department of Agriculture, 2019).

Farms with female producers making decisions tend to be smaller than average in both acres and value of production (U.S. Department of Agriculture, 2019). Many women farmers are serving as trailblazers as they become involved in activities centered on sustainable and organic farming, specialty crops, and raising small livestock — including chickens, goats, and pigs.

Farmers Are Overwhelmingly White

Farmland in the United States has been highly concentrated among white farmers and owners (95 percent), and this has increased over the past century (U.S. Department of Agriculture, 2019). Ownership and control of land strongly affects many aspects of rural life. Land ownership is important since it is often one of the few (and largest) forms of wealth, offering the opportunity to fully participate in and contribute to community life.

Racism and Discrimination Persists against Black Farmers

Black land ownership peaked in 1910, when 218,000 African-American farmers owned about 16 million acres of land (Gilbert, Wood, & Sharp, 2002). Over the past century, Black farmers in the U.S. have lost more than 12 million acres of farmland due to a combination of systemic racism, biased government policy, and social and business practices that have denied African Americans equitable access to markets. In 1920, Black farmers made up 14 percent of all US farmers (Banks, 1986). But by 2017, that figure had shrunk to 1.3 percent (U.S. Department of Agriculture, 2019).



Black farmers protest at Lafayette Park across from the White House in Washington, D.C. on September 22, 1997.

USDA photo by Anson Eaglin, via flickr. Public domain.

For Black farmers, the competitive pressures exerted by land consolidation have been compounded by intentional, systematic, institutional racism. Starting with the New Deal in 1937, federal agencies have systematically denied Black farmers loans. White administrators became the regulators of most of the farm economy. Discriminatory loan servicing and loan denial by white-controlled, federally-funded committees forced Black farmers into foreclosure, and their property was purchased by wealthy white landowners. Lynching, police brutality, and other forms of intimidation were sometimes used to force Black farmers off their land as Black families fled racial terror in the South (Newkirk II, 2019). Heirs' property laws, an informal system in which land is passed down without a will through generations, have left Black farmers without clear title to their farmland. This has exacerbated access to credit and farm supports, contributing to farm loss.

Indigenous Farmers Forced Off Their Lands and Discriminated Against

Just 1.7 percent of the farmers in the U.S. are Indigenous. Throughout history, they have been ostracized, ignored, and relocated by treaty or force, from their homelands.

The lending practices of the USDA have also been found to have been discriminatory against Native Americans. In 1999, the *Keepseagle v. Vilsack* class-action suit alleged that the United States Department of Agriculture had engaged in discrimination against Native American farmers and ranchers in loan programs and servicing of loans dating back to 1981. In 2010, after more than a decade of litigation, the federal government and the parties to the lawsuit agreed to a settlement.

Today, Black and Indigenous farmers continue to lack land equity and access to resources typically provided to white farmers, such as loans; subsidies; and technical assistance. While discrimination against Black and Indigenous people has caused generational trauma and some loss of community knowledge. But today, many Black and Indigenous farmers are working to restore their heritage farming practices, which has inspired regenerative practices promoted by predominantly-white organizations today. Reviving this knowledge and getting Black and Indigenous farmers and ranchers back on the land is an important step towards addressing inequity in farming.

Discrimination Also Occurs Against Hispanic and Women Farmers

In 2017, 112,451 producers in the U.S. identified being Hispanic, Latino, or of Spanish origin. This represented just over three percent of the country's 3.4 million producers. The majority of Hispanic producers were in Texas, California, New Mexico, and Florida, and were outside RE-AMP's footprint. These farmers and ranchers were younger and more likely to have recently started farming than U.S. producers overall. Although they are of Hispanic origin, these farmers are largely classified as white, because the Census Bureau considers the category "Hispanic" to be an ethnicity, rather than a race (U.S. Department of Agriculture, 2019).

Additional class action lawsuits were brought against the USDA in 2000, when groups of Hispanic and women farmers alleged race and gender discrimination. These suits, (*Garcia vs. Vilsack*) and (*Love vs. Vilsack*) were settled in 2011. Like Black and Indigenous farmers, Hispanic and female farmers claim local USDA offices denied them loans and other assistance that routinely went to white, male farmers between 1981 and 2000. The American Rescue Plan includes debt relief for Latino and Hispanic producers, but excludes white women typically included in many other "minority" benefit programs.

"The current agriculture and food system is so extractive to the earth. It's objectifying the earth — seeds, plants, plant relatives, and other food sources. We need to reconnect and build our relationship to the earth so we have an earth to pass on to future generations."

- JESSIKA GREENDEER, DREAM OF WILD HEATH

Exploitation of Farm and Food System Workers

Raising and processing fruits, vegetables, and meat relies on human labor. Farm labor puts food on our tables, powers the economy, and supports our communities. Farm workers and those who work in concentrated animal feeding operations and meat and poultry processing facilities are mostly an immigrant workforce, many of whom are undocumented. As RE-AMP states look to agricultural practices that equitably reduce harmful greenhouse gas emissions, it is essential that the health, safety, and well-being of workers who grow, harvest food, and raise and process animals be considered.



Migrant workers spend hours in the field, where they are exposed to pesticides and other chemicals and other hazards. Most are unauthorized, which prevents them from approaching employers for fair wages and safe working conditions.

USDA photo by Lance Cheung, via flickr. Public domain.

The USDA estimates about 75 percent of agricultural workers today were born outside of the United States. Most are from Mexico and Central America. About 50 percent are unauthorized (National Center for Farmworker Health, 2020). These workers pay taxes and contribute to the U.S. economy, but every day they live under the threat of arrest and family separation while working in extremely difficult conditions; and many live in poverty.

According to 2015-2016 survey results, 33 percent of agricultural worker families had family income levels below the national poverty guidelines (National Center for Farmworker Health, 2020)— more than double the rate of the country as a whole. These workers also are vulnerable to wage theft. Their immigration status makes it difficult to challenge employers, because they fear deportation (Costa, Martin, & Rutled, 2020).

Labor and Safety Laws Don't Protect Those Who Grow Crops

Agriculture ranks as one of the most dangerous industries in the nation (U.S. Bureau of Labor Statistics, 2020). Many of the labor laws and protection standards enacted through federal and state governments — designed to protect the health, safety, and interests of workers — have exemptions for agricultural employers. This includes the National Labor Relations Act, which protects workers from retaliation for labor organizing; and the minimum wage provisions in the Fair Labor Standards Act (FLSA). Thousands of agricultural laborers and farm workers are not entitled to overtime pay under the FLSA. Also, farms with fewer than 10 full-time employees are excluded from having to provide most worker protections (wages, child labor, working week), including those around health and safety. That means no standards exist that would protect these workers from the use of poisonous pesticides, heat or cold, or at-work injuries (Henderson, 2020). The Biden administration is moving forward with rules that could protect farm workers and others from extreme heat. This action is a response to the effects of climate change, which has resulted in heat-related deaths associated with longer, hotter and more suffocating summers (The White House, 2021).

Hazardous Conditions Exist for Workers at CAFOs

The expansion of CAFOs throughout the RE-AMP region has increased livestock farm worker exposure to hazards associated with high, animal-density confinement. The majority of workers in these intensive animal feeding operations are immigrants who have relocated to the rural towns dominated by the industry.

Employers find unauthorized workers to be ideal recruits because their status makes them less likely to complain about low wages and hazardous working conditions because of fear of reprisal. Accidents in CAFOs are common and include tractor rollovers; kicks and bites from animals; and injuries from workers being pinned between animals and fixed objects.

Every facility has a unique combination of gases and particulate matter depending on the species of animal; the type of feed; the method of ventilation; and the facility's manure handling, and storage practices. Farm workers routinely inhale hazardous levels of particulate matter as well as ammonia and hydrogen sulfide gases, which has devastating health impacts on livestock workers. As many as 30 percent experience occupation-related asthma and chronic bronchitis. Lengthy exposure to particulate matter and gases can cause lung disease and heart attacks (Miller & Muren, 2019).

Like most agricultural employees, livestock workers in CAFOs struggle to avoid hazards in the workplace; and to earn a living wage. Motivated by the need to support their families, workers choose to continue working in conditions that pose serious risks to their health. The fact that workers compromise their physical health to achieve financial security is an indictment of both the industry's ethics and the priorities of state and federal labor agencies.

Injuries Are Common at Meatpacking/Poultry Processing Plants

The slaughter and processing of meat also relies heavily upon rural workers, who are disproportionately immigrants, refugees, and people of color with few options for employment. Among these, a majority come from Latin America, with smaller numbers from Asian and African countries. The vast majority of immigrants working at these facilities are noncitizens (Stuesse & Dollar, 2020)

Workers must navigate slippery floors, perform repetitive motions for long hours, wield sharp knives and industrial saws, and process hundreds — if not thousands — of animals each day. At these breakneck paces, one wrong move can result in anything from a laceration or a pulled muscle -to far more gruesome and permanent injuries, including amputations.

The need to provide protection and improved sanitation was particularly evident during the pandemic, when outbreaks of COVID-19 resulted in the closing of meatpacking and poultry processing facilities due to illness and death among workers. Among those cases where race/ethnicity was reported, 87 percent occurred among racial or ethnic minorities (Waltenburg, Victoroff, Rose, & et al, 2020).

“Covid has laid bare the dark underbelly of industrial agriculture.”

- DON STULL, PROFESSOR
EMERITUS, ANTHROPOLOGY,
UNIVERSITY OF KANSAS



Workers processing turkeys at meatpacking facility in Pennsylvania, 2018.

USDA, via flickr. Public domain.

Impacts of Consolidated Power

Over the years, mergers and acquisitions have increased corporate concentration across many agricultural markets, to the detriment of consumers and rural farmers across the country. This concentration has coincided with a reduced focus on antitrust enforcement; ever-increasing globalization that is locked in by international trade rules; and farm policy that encourages farms to “get big or get out,” due to the perception that large-scale agriculture achieves economies of scale that better integrate with global markets.

When corporations produce seeds, process meat and milk, and serve as grocery retailers, they dominate our food and agricultural systems and have enormous power to control markets and pricing. There also are a wide range of forces, such as volatile international trade relations, technological advancements, and climate change that pressure U.S. farmers. The impact of mergers and acquisitions on agriculture and our food system is further exacerbated by the growing trend in non-U.S. ownership of farmland, which threatens food security.

Impacts of Mergers on Farm Inputs

Access to agricultural inputs, including improved seeds, fertilizers, pesticides, herbicides, and knowledge, is essential for conventional farming and farmer profitability. But mergers among corporations that produce seed, agricultural chemicals, and seed research have resulted in just four corporations that provide these inputs to farmers today. These are: Bayer-Monsanto (the name Monsanto has been dropped); BASF; Corteva; and ChemChina-Syngenta. With such few competitors in a market, farmers have few alternatives when a seller raises seed or chemical prices, and are vulnerable to exploitation. Current U.S. antitrust law assumes most mergers do not create harm, and places the burden of proof on antitrust enforcers such as the Federal Trade Commission or the Department of Justice (Huddleston, 2021).

How Consolidated Power Affects Farm Income

Because the processing, transport, and distribution networks are so concentrated, farmers not only face higher costs for their inputs, but they also experience lower prices than in years past. In the 1980s, farmers got 37 cents from every dollar consumers spent on food. By 1993, they received just 17.6 cents of every dollar. By 2019, that amount had reduced to 14.3 cents (U.S. Department of Agriculture, 2021). This drives farms to survive on volume, which spurs consolidation, pushes out mid-sized operations, and creates a system where only the largest farms can make a profit. With 1 in 5 rural counties dependent on farming (McGranahan & Ghelfi, 2004), and a rural poverty rate averaging 3.1 percent higher than exists in urban areas, rural America cannot afford depressed farm earnings (U.S. Department of Agriculture, 2019).



**Farm
Share**
14.3¢

**Marketing
Share**
85.7¢

In 2019, Farmers received just 14.3 cents on every dollar.

Source: (U.S. Department of Agriculture, 2021)

Threats of Land Ownership by Non-U.S. Investors

As of late 2019, investors outside the United States held an interest in almost 35.2 million acres of U.S. agricultural land, an area larger than New York. Canada, the Netherlands, Germany, and the United Kingdom are among those countries with various levels of control over U.S. farmland, which includes land used for farming, ranching, or timber production. Land holdings from investors outside the U.S. are greatest in Michigan (at nearly 6 percent) followed by Ohio, Illinois, and North Dakota (at just over 2 percent) (U.S. Department of Agriculture, 2019). See Table 9, APPENDIX 1.

The holding of land by any investor, but particularly investors outside the U.S., means that wealth created through production of food, fuel, and feed or harvesting timber is being extracted and transferred to the pockets of someone located hundreds, or even thousands of miles away. This separates out-of-country land owners from the consequences of polluting or degrading their land. It also leaves surrounding communities with little to no say over what happens to the resources that surround them, and no access to the wealth that corporations or non-U.S. owners enjoy from selling what they extract.

International investors looking to own land in the U.S. also flood real estate markets with their proposed purchases. This inflates farmland prices, closing the doors to U.S. farmers who want to live and work on the land. As farmers age and farms consolidate, it becomes increasingly difficult for young or Black, Indigenous, and other farmers of color to purchase land in these inflated markets.

The background of the page is a photograph of a person's hands holding a small plant seedling in a field. The person is wearing a blue long-sleeved shirt and a blue cap. The field is green and appears to be a vegetable field. The image is slightly blurred and has a warm, orange-toned overlay.

CHAPTER 4

OPPORTUNITIES FOR TRANSFORMATION

Guided by shifting mindsets, power dynamics, and relationships, a variety of policies, practices, and programs can be adopted to achieve equitable, regenerative food systems.

Engaging RE-AMP States in Transformative Change

Effectively reducing greenhouse gas emissions from farming and food production, while also addressing social and economic inequities inherent in those systems, requires a multi-faceted, transformational approach that reshapes the way we think about agriculture. Chapter 3, MIDWEST CONTEXT, provided background and context of food and farming systems as they exist today, while laying the groundwork for opportunities to transform these systems. What follows is an evaluation of the foundational mindsets, power, and relationships that must be adapted to achieve change, along with a discussion of practices, policies, and promising program models that may help achieve the Network's North Star Goal.

Each state in the RE-AMP region will differ in their approach to promote, legislate, or otherwise bring about transformative change in the agricultural sector. Each has their own cultural context, political environment, and capacity to focus on equitably reducing emissions from agriculture. But each of the nine states will need to take some action to meet the Network's North Star Goal. Each state can engage in some way, whether it be supporting federal legislation; developing or supporting statewide legislation; or replicating models that reduce emissions, but also increase access to land, training, and loans for Black, Indigenous, other farmers of color, and women who have experienced systemic racism and discrimination that has resulted in the loss of their farms. The extensive recommendations included in this report can be adapted, as needed, to help facilitate transformation.

Mindsets

In systems change work, mindsets are often at the foundation of our current system. And shifts in mindsets are how we begin to fundamentally shift systems. After all, all of our existing programs, initiatives, and policies came from somewhere: they came from current or past mindsets that led us to this place. In particular, the mindsets of people in *power* shaped our current programs, initiatives, and policies.

Recognize and Repair Racialized Harm in the Food and Agricultural System

Harm committed against Black, Indigenous, and other farmers of color needs to be addressed. Reparations for stolen land and labor is critical to moving forward with a just food and agricultural system, as is the need to acknowledge and shift patterns of racialized capitalism in the food system. This will require putting farmers of color at the top for program beneficiaries, inverting the economic incentives that typically flow the other way. Black, Indigenous, and other farmers of color must be recognized as leaders for changes that bring about a more fair, just, and environmentally-sustainable food system.

Shift Mindsets Away from Extraction and Dominance

Programmatic and policy interventions should engender a reconnection and building of our relationship to the earth and respect for future generations. Honoring and seeing the earth as a living system is among the most fundamental of mindset shifts that could be made to bring about a change from destructive conventional farming practices.

“We’re never going to get a solution to a climate crisis inside the context of racialized capitalism. As long as that exists, there’s an impetus and motivation for profit to overwhelm everything else. The first and most important innovation is a new economic system that does not rely on destruction, extraction of human and natural resources.”

- JOSE OLIVA, HEAL FOOD ALLIANCE

“We need to decarbonize our way of being. We are brought up in a world of fossil fuels, we just keep perpetuating that way of being in the growing of foods, producing materials, and how we interact with each other. If I look at you in the frame of mind of extracting how much I can get out of you, I design a process of how to do that.”

- FRED CARTER, BLACK OAKS FARM

Apply a Regenerative Mindset to all Parts of the Food System, Not Just the Farm

An important mindset shift is toward one that considers regenerative *food systems*, not just the practices that happen on the farm. A regenerative food system would permeate the entire food supply chain and include developing a regenerative organic certification, ensuring worker fairness, and engaging the community.

Lay the Myth to Rest: America is Not Feeding the World

Myths and narratives provide powerful mental models and ways of understanding the world. A common narrative is that America feeds the world. This narrative results in the justification of overproduction and rampant pollution. American farmers today, and especially Midwestern farmers, produce significant amounts of fuel, fiber, and feed for animals, but they are not feeding the world. By laying this myth to rest, production can be “right-sized”, and harmful effects that come from efforts to maximize harvests of commodity crops can be reduced.

At the same time, the story about the “basket of goods” from farms can be reframed and retold. Farms can provide a plethora of benefits to their community and the world: water quality improvements; reduced threat of flooding; carbon sequestration; renewable energy; increased biodiversity; and more.

Promote Narratives that Feature Farmers as Champions and Heroes

Stories shape our world by shaping how we think. Farmers too often are cast as villains in the narratives of the climate community, drawing up unnecessary battle lines. Climate advocates should be encouraged to find and highlight the farmers who are already taking action on climate and ask them to be spokespeople rather than furthering a narrative of farmers being the problem. The fact that so many farmers employ no-till (nearly 23 percent of Midwestern farmers) and use cover crops (10 percent of Midwestern farmers) means there are ample champions to work with.

“As an Indigenous woman, I’m focused on the earth and the plants as living beings, something that has a spirit. Just as we want someone to ask us permission to do something, we need to do the same thing with the earth. Mother Earth is very forgiving to the amount of damage that we’ve done over time. In the history of humans, in the last blink of an eye, is when we’ve done the most damage.”

- JESSIKA GREENDEER, DREAM OF WILD HEALTH

Relationships and Connections

Systems are made up of numerous parts that interact with one another. Changing a system necessitates re-orienting and modifying how those parts interrelate. The following identifies a number of relationships that, if shifted, would help usher in the larger changes required to equitably reduce emissions and build a healthy, just, and sustainable food and agricultural system.

Widen the Range of People Who are Connecting with the Land through Farming

Currently, 95 percent of farmers in the U.S. are white (U.S. Department of Agriculture, 2019). Shifting this will require programs that intentionally support Black, Indigenous, and other farmers of color to return to the land through reparations, grants, and other financial mechanisms put in place to access land and make capital investments. It will also require supporting knowledge-sharing through prioritizing Black, Indigenous, and other farmers of color in technical assistance programs and farmer-to-farmer teaching programs. USDA was authorized to issue direct payments to Black farmers, as approved in the American Rescue Plan Act of 2021, to forgive debts on USDA loans and make amends for past discrimination. Payments began June 2021 but a lawsuit alleging discrimination against white farmers has put the program on hold.

Supporting the next generation of farmers, and the passing on of generational knowledge to young farmers, will require deliberate investments to ensure access to land, assistance to make other capital investments, and access to training and skills building. Investing in young farmers and ranchers is the only way to ensure they will succeed. Investing in education that promotes more sustainable practices will both attract the next generation of farmers, as well as create potential for implementing strategies that draw down and store carbon and improve habitat, water quality, and biodiversity.

“The change that needs to take place is like me and you having this conversation. Who else can we enroll in the application of this? If we start now, we can also talk about the policy side of it. We’ve got to keep building the ambient practices of trying to do something different.”

- FRED CARTER, BLACK OAKS FARM

Finally, intentional efforts must be made to create gender equity in farming to enable women to get in and stay in farming.

Improve Interagency Communication

There are currently a myriad of assistance programs for farmers to access financial and technical assistance. However, farmers must apply separately for each program, often housed in different agencies that do not communicate with each other. Improving interagency communication and simplifying paperwork so farmers do not have to apply for multiple programs that achieve the same or similar goals would help significantly. Expanding broadband to rural areas also would remove another barrier to accessing technical and financial assistance.

Connecting to the Land

Conventional farming can separate farmers from their land. Literally touching the soil can shift relationships and mindsets. Whether connecting to the land is seen as a faith-based practice or a pragmatic secular practice, such connection can increase familiarity with the earth's living systems. Deepening the relationship with the earth's living systems can counter an extractive mindset and foster a greater appreciation for both the fragility and the resilience of working lands.

“Farmers need to reconnect with the land they are charged with managing. That is a societal change that needs to happen, isn’t it? If I had a magic wand I would have everybody go out and walk barefoot through their fields once or twice, not just their fields, but the native prairie that nobody seems to care about.”

- JONATHAN LUNDGREN, DIRECTOR/CEO OF BLUE DASHER FARM

Create and Support Spaces for Trust Building and Learning

Farmers trust and learn from one another. Increasing opportunities to build trust and peer-to-peer learning, especially on holistic approaches to land health, can accelerate change. For many farmers, it is hard to be an early adopter of new practices because of financial and social risks. But according to the 2018 Iowa Farm and Rural Life Poll, 70 percent of farmers interviewed said they would try a new technology or practice once they have seen “a number” or “most” of their peers try it successfully (Arbuckle, 2019).

Opportunities for building trust and relationships need not be just among farmers, but also can occur with community members, technical experts, etc. In this way, professional development opportunities can expand the number of farmers doing work in soil health, cover crops, and carbon sequestration, while also building farmer support, and potentially, markets.

All farmers practicing regenerative agriculture may not yet be ready to go down to the local coffee shop and talk to other farmers about it. New spaces must be created to normalize and teach practices that will improve soil health, water quality, biodiversity, and sequester carbon. Organizations can advocate for the increase of programs and institutions that normalize healthy land practices, because farmers are inspired by — and frequently learn best from — other farmers.

Reconnect People to their Food

Many Americans are disconnected from the food system and may benefit from assistance that helps them make different food choices. Shifting mindsets in this way will require developing and promoting education that helps people understand the benefits of locally-produced foods; creating incentives to encourage individuals and families to purchase locally-produced foods; and raising awareness of the impacts of climate change on our food systems. This could also include ensuring the K-12 curriculum includes a focus on land, water, and soils, so children learn how their food is grown and where food comes from.

“We are at the point where regenerative agriculture is more than a weird conversation at the coffee shop. Farmers understand that techniques such as reduced tillage and cover crops are good for soil health, by reducing weed pressure, soil erosion, and nutrient loss. Farmers can see it — it’s becoming more visible, and its benefits are understood and seen at a local level. It’s beginning to ‘catch on’

- REBEKAH CARLSON, NORI

Power

Systems change is fundamentally about shifting power, and our work is to shift the system toward an equitable balance of power. In this section, opportunities to shift the balance of power to enable the changes we seek in the food and agricultural sector are highlighted.

Shift the Power by Diversifying Who is Farming

Grassroots organizations that work on farmer diversity are best suited to bring the importance of diversity and equity in farming to communities and community groups. Finding and highlighting pioneers and leaders of color who can demonstrate and help create more diversity in who farms, what they farm, and how they farm, is critically important.



Jerry Hebron, Oakland Avenue Urban Farm and Erin Bevel, Detroit Black Community Food Security Network raise funds to help Black farmers purchase land to farm in Detroit.

Photo by Ray Patrick Hooper. June 2020. Courtesy of Oakland Avenue Urban Farm.

Enforce Antitrust Policy and Address Monopolization

The current food and agricultural system rewards efficiency and a “bigger is better” approach. However, this concentrated power isn’t producing healthy outcomes for people, our climate, and ecosystems. Enforcing existing antitrust policies and slowing down the consolidation of farms are two steps that can be taken to address monopolies. At the same time, there is a need to ensure food security by slowing the movement that takes farmland out of the hands of farmers and puts it into the hands of institutional investors.

To have a meaningful impact on climate change, agribusiness will need to be confronted. Agribusiness spent more on lobbying in the United States in 2020 (\$138,660,000) than defense lobbyists (\$103,920,000) (Duffin, 2021). A good first step would be to break up the agribusiness giants that have virtual monopolies in regional seed, chemical, and meat markets through better enforcement of existing antitrust laws.

Organizing and Mobilizing

Organizing and mobilizing at multiple levels can bring about changes to the agriculture and food system. Examples include:

- **Food worker and farm worker organizing.** Uncover and act to eradicate labor exploitation in the food system (this includes exploitation of farmers by industrial agriculture). The federal government should amend labor laws that currently exclude agricultural employers from protecting the health, safety, and welfare of their workers. This includes amending those laws to allow union organizing for safe working conditions and decent wages.
- **Consumer organizing.** Consumer demand can have a significant influence on the market. Creating a powerful push from consumers can help usher in a transformation of the food and agriculture system.
- **Farmer organizing.** Helping build farmer political power and ensuring farmer voices are speaking directly to decision-makers about issues that will affect them is critical to shift policy toward more regenerative agricultural practices and more just food systems.

Coalition Building

A broad coalition provides great leverage for change making. At the time of this writing, there are few broad coalitions focused on the nexus of climate and agriculture in the Midwest. But narrowly focusing on carbon isn't the solution. Building broad and strong coalitions at the state level to pass holistic climate state legislation aimed at equitably changing food and agricultural systems that include ending discrimination and structural barriers to farming; ending food apartheid; and enhancing ecosystems through practices that improve soil health is important.

“If someone is starving for food, they’re starving for education. Not just starving for one thing.”

- AARON MARKS, PROJECT RALLY

Reverse Nutritional Redlining

Food apartheid is a term that describes the “systematic destruction of black self-determination to control one’s food; hyper-saturation of destructive foods and predatory marketing; and blatantly discriminatory corporate-controlled food system that results in [communities of color] suffering from some of the highest rates of heart disease and diabetes of all time” (Cooper, 2017). To shift to an equitable and just food system, communities most impacted and exploited must have the power to re-shape, re-define, and develop community-based solutions that are racially equitable, healthy, environmentally sound, and just. This power can be achieved through coalition building, grassroots organizing, and sound policy.

Practices

Corporate agribusiness claims their seeds, chemicals, and synthetic fertilizers are needed to feed a growing global population. But evidence points to a new wisdom: the world cannot be fed unless the soil is fed. The practices described as regenerative agriculture that follow enhance and sustain soil health by restoring its carbon content. This, in turn, improves productivity — unlike conventional agriculture, which degrades the soil and relies upon the continuous application of chemicals.

While there is no definitive term for “regenerative agriculture,” regenerative agriculture is typically understood to be a system of farming principles and practices that increases biodiversity, enriches soils, improves watersheds, and enhances ecosystems. When many of the techniques that follow are used, regenerative agriculture can capture atmospheric carbon and store it in soil and aboveground biomass, potentially reversing current global trends of atmospheric accumulation. At the same time, many regenerative farming practices offer increased yields; resilience to climate instability; and better health and vitality for farming and ranching communities. This system and its associated benefits draw from decades of scientific and applied research.

No one technique achieves all the benefits described above. But, it is widely accepted that maximizing soil health can be achieved by avoiding chemical inputs (synthetic fertilizers, herbicides, and pesticides); minimizing soil disturbance by practicing “no-till”; planting cover crops and trees (see Agroforestry, below); and adding animals to the land. Healthy soils allow plants to draw down and sequester carbon through photosynthesis, while also restoring and enhancing ecosystems harmed and degraded by chemicals. In contrast, damaged soil releases carbon into the atmosphere (Schwartz, 2014).

Techniques and Practices

Techniques described below were widely cited by the experts interviewed for this report and are intended to optimize soil health, while increasing farmer profit through cost savings (reduced or eliminated chemical inputs) and diversity (plants and animals). These techniques are categorized into the following five principles: don’t disturb the soil; cover the soil surface; sustain living roots in the soil; grow a diversity of crops; and add grazing animals to the land.

PRINCIPLE

1

DON'T DISTURB THE SOIL

Soils are rich with microorganisms that are alive and include their own ecosystems. Tilling the soil or treating it with chemical fertilizers, pesticides, or herbicides will destroy these living organisms and systems, which sequester carbon and support plant growth:

- **Chemical inputs.** Chemical inputs destroy the soil and its ability to sequester carbon. Replacing synthetic fertilizers with organic compost or livestock manure from grazed animals creates healthy soil and more nutrient-dense food. Herbicides and pesticides can be more easily eliminated if farmers diversify crops and plant crops that attract pests away from those grown for profit.

“In 2019, I experienced a \$170/acre profit over the prior year in a field where I introduced no-till and cover crops. That much profit in just one year speaks loudly of the benefits that cover crops and no-till practices can bring to a farmer via improved soil health.”

- DEL FICKE, DEL FICKE, FICKE CATTLE COMPANY

- **No-till.** Tilling the soil is a common practice that breaks up the soil and makes it easier to plant crops. However, tilling destroys soil structure and releases CO₂ into the atmosphere. Conservation tillage practices, particularly continuous no-till – can save time and money compared to conventional tillage. No-till reduces the release of CO₂ that occurs with tilling; improves soil health; increases the potential for carbon sequestration; and reduces annual fuel and labor costs. Fields managed using no-till for multiple years generally have a higher water holding capacity than conventionally-tilled fields. This is particularly important in drought-prone areas, where lack of water is a major concern and is tied to crop loss.

No-till adoption also reduces soil erosion, increases soil biological activity, and increases soil organic matter. These benefits create economic gains for farmers over time (Creech, 2021)

Reduced-till practices (tilling every few years or only in the seedbed) may actually be releasing previously sequestered carbon back into the atmosphere. Losses of CO₂ most likely depend upon the degree of soil disturbance and soil type. The loss of soil carbon can reduce soil productivity; increase the need for fertilizer inputs; and reduce farm profits. Therefore, policies that incentivize no-till, versus reduced-till practices, appear to be most beneficial for farmers; soils; carbon sequestration; and other ecosystems.

PRINCIPLE

2

COVER THE SOIL SURFACE

Rain, wind, and sun can damage the soil and its micro-ecosystems. Farmers who keep soils covered with a canopy of cover crops or stubble (remaining debris) from harvested crops can naturally add fertility to the soil. Cover crops also reduce erosion and improve water quality; build soil carbon and soil organic matter; suppress weeds, reducing the need for herbicides; reduce compaction and improve the structure and strength of soil; reduce the loss of moisture from evaporation; improve biodiversity by attracting birds and insects; and provide forage for livestock.

Most crop farmers across the U.S. are eligible for cover crop incentive payments through the National Resource Conservation Service, which pays \$50–\$54 per acre for the “basic” cover crop rate of a single species. Payments increase with the use of multi-species cover crop mixes, or for special categories (such as organic farming or being a beginning farmer or socially-disadvantaged farmer). These payments are intended to help farmers begin the process of cover cropping but are not a long-term subsidy (Myers, Weber, & Tellatin, 2019).

“We can pay for ecosystem services for tons of carbon sequestered, and incentivize farmers to sequester carbon in soil or trees. The question is how much to pay farmers? It’s about a nickel a pound. 6-7 cents/lb. more exactly = \$120 to \$130 per ton of carbon.”

- RATTAN LAL, CARBON MANAGEMENT AND SEQUESTRATION CENTER, OHIO STATE UNIVERSITY

This is a practice that is gaining support. Incentives could be expanded to incorporate livestock and include farmer training so that a diverse planting of cover crops are selected to feed livestock, maximize soil health and improve biodiversity.

Cover crops can be mowed, harvested, or foraged by livestock. However, the benefits of cover crops that are “burned” with chemicals are lost. This is because: the residue remaining from the chemicals decreases infiltration and increases runoff; carbon in the biomass is converted to CO₂ and emitted rather than being stored in the soil; toxic gases emitted by chemicals are emitted into the atmosphere; and soils are left uncovered, leading to erosion and water pollution (Anguelov, Arriaga, Balkcom, Barentine, & et. al., 2020).



A cover crop mixture of winter rye, radish and clover interseeded into standing corn was allowed to grow throughout the growing season to provide a diversified root system for soil biology.

USDA NRCS South Dakota,
via flickr.

PRINCIPLE

3

SUSTAIN LIVING ROOTS IN THE SOIL

Roots are essential to food webs that thrive in soil and are a food source for bacteria and fungi. The bacteria and fungi, in turn, feed single-cell organisms, which are eaten by earthworms and higher organisms. Adding cover crops to ensure the soil is never bare (as previously described) is one way of accomplishing this goal. But, according to researchers, perennializing the agricultural landscape is the single most effective thing that can be done to sequester carbon.

- **Perennializing Grain Crop Agriculture: A Pathway for Climate Change Mitigation & Adaption** prepared by the Land Institute for the U.S. House Select Committee on the Climate Crisis, shows how perennial grain crops can replace much of U.S. and global grain crop production, resulting in transformational increases in carbon sequestration.
- **Agroforestry**, the intentional integration of trees and shrubs into crop and animal farming systems, can more effectively sequester atmospheric CO₂ than either pastures or field crops growing under similar ecological conditions. Perennial woody plants, such as trees and shrubs, store the carbon long-term. They take carbon from the air through the process of photosynthesis and store it as carbon in their trunks, roots and branches. Trees and shrubs increase biodiversity, and reduce erosion (which improves water quality). See Principles #4 and #5, below, for more information.

“When we get the soils right, we get society right. Employment goes up. Neighbors work together again.”

- DEL FICKE, FICKE CATTLE COMPANY



Healthy Midwestern soil is dark, moist, crumbly, and porous, allowing plant roots to grow unimpeded. It smells sweet and “earthy”, and is home to worms and other organisms.

USDA-NRCS photo by Catherine Ulitsky, [via flickr](#).

PRINCIPLE

4

GROW A DIVERSITY OF CROPS

Monocultures do not exist in nature which tends to favor high amounts of diversity in an ecosystem. Diversifying and rotating crops (other than growing corn and soybeans, which is a recipe for pest advancement) can: Increase economic stability (by adding sources of income), make soil healthier, provide habitat for beneficial insects and reduce pest numbers, and increase farmer profit and support local and regional economies.

One of the best examples of crop diversification is agroforestry described under Principle #3, above. Agroforestry can include:

- **Alley cropping.** Planting crops between rows of trees to provide income while the trees mature.
- **Forest farming.** Growing food, herbal, botanical, or decorative crops under a forest canopy that is managed to provide ideal shade levels.
- **Riparian forest buffers.** Re-establishing natural areas along rivers and streams, and lakes with trees, shrubs, and grasses to help filter farm runoff and stabilize banks to prevent erosion.
- **Windbreaks.** Planting trees to shelter crops, animals, buildings, and soil from wind, snow, dust, and odors.
- **Silvopasture.** Combining trees with livestock and their forages on one piece of land. The trees provide timber, fruit, or tree nuts as well as shade and shelter for livestock and their forages, reducing stress on the animals from the hot summer sun, cold winter winds, or a downpour. See Principle #5, below.

This practice creates environmental, economic, and social benefits while capturing and sequestering carbon via trees and woody shrubs. (U.S. Department of Agriculture, n.d.)

PRINCIPLE

5

ADD GRAZING ANIMALS

Animal grazing creates pastures and can help restore fields, improving soil health more rapidly over a few years. When ranchers and farmers use management practices that mimic natural patterns — livestock can cycle nutrients and spread fertility while living in natural and humane conditions. The following techniques and practices are “best practices” for regenerative farming that sequesters carbon and improves other ecosystems by adding animals. Many of these incorporate techniques described in the prior four principles:

- **Managed Grazing.** Livestock plays an irreplaceable role in maintaining topsoil. As herds graze, their manure and urine are trampled into the ground along with plant matter which decomposes and enriches the soil’s network of microbial life. This natural process replaces synthetic fertilizers otherwise required for crop production. It also reduces fossil fuel use and improves soil, water quality, wildlife habitat and biodiversity. In contrast to CAFOs, which are largely corporate-owned, introducing animals onto the land provides a livelihood for farmers and their families, enabling them to contribute to local economies.



Cattle grazing in a silvopasture.

USDA NRCS Texas, [via flickr](#).

Without management, overgrazing can occur. This increases soil erosion and reduces soil depth, organic matter, and soil fertility. Farmers and ranchers can avoid these negative impacts by rotating livestock through fields of high-quality grasses and legumes that both cover the soil and feed the animals. Then, they are allowed to rest and re-grow. Managed grazing works with natural, biological processes to improve overall farm health and build productive capacity, rather than focusing on short-term gains. Moving animals, particularly cows, back onto the land increases CH₄ emissions from belching due to eccentric fermentation. This is because they live an average of four to six months longer before being sent to slaughter. However, the benefits of improving soil carbon sequestration and other ecological systems are thought to compensate for these increases.

- **Silvopasture.** Silvopasture is a type of agroforestry, created by introducing forage into a woodland or tree plantation or by introducing trees into a pasture. Silvopasture systems provide shade for livestock, which reduces heat stress and improves animal performance and well-being. Trees also increase wildlife habitat and biodiversity, and improve water quality. The woody trees and shrubs capture and sequester carbon, and the forage protects the soil from water and wind erosion. The animals add organic matter to improve soil properties, allowing for additional carbon storage.

By some measures, silvopasture outpaces any grassland technique for counteracting the CH₄ emissions of livestock and sequestering carbon (Hawken, 2017). This system can sequester five to ten times as much carbon as pastures of the same size that are treeless, storing it in both biomass and soil. The diversification of trees, shrubs, and livestock increases farmer profit and helps insulate them from risk, while building local economic capacity. Silvopastures also can create attractive landscapes with “park-like” settings, adding to the quality of life in rural communities.

Co-locating Solar Energy with Agriculture

The RE-AMP Network's goal of equitably eliminating greenhouse gas emissions by 2050 is likely to require a substantial increase in the deployment of solar energy. Installing conventional, utility-scale, solar arrays requires significant land and often is proposed on farmland near urban centers. Many farmers and communities perceive the planned conversion of farmland to energy production as “energy sprawl,” pitting solar developers against farmers and farming communities. But an emerging technology that co-locates agriculture and solar photovoltaic infrastructure called agrivoltaics could reduce land use conflicts and competition and provide synergistic benefits to solar, agriculture, ranching, and pollinators. This technology also could provide emissions-free power for farmers or provide them with an additional source of income through solar leases.



UMass Grad harvests vegetables under solar panels.

National Renewable Energy Laboratory, DOE Inspire. 2019, via flickr.

Agrivoltaics Explained

This term is derived from “agriculture” and “photovoltaics” (generating electricity from sunlight). With this technology, panels are installed at a height that typically ranges from seven to 10 feet to accommodate crop production and grazing. Providing gaps between panels in the same row allows sunlight to reach plants and animals. This systems-thinking approach can help solve the intertwined issues of long-term sustainable farming and energy production. If properly deployed, agrivoltaics can provide food and energy, reduce water consumption, and lower carbon emissions. Co-locating agriculture and solar also can increase prosperity in rural communities through job creation (Proctor, Murthy, & Higgins, 2021).

Researchers are finding the partial shade provided by agrivoltaic systems not only is good for many crops, but also can increase yields and water use efficiency, and reduce stress experienced by crops during drought (Youngquist, 2019). The panels' shade improves animal comfort by reducing heat stress (University of Minnesota Extension, 2019). Agrivoltaic systems are also more efficient due to cooling provided by the shaded, vegetated ground, and can produce as much as 10 percent more electricity (Adeh, Good, Calaf, & Higgins, 2019).

Low-Impact Solar for Pollinators

Most often, large solar systems are constructed on land that is leveled after the topsoil and vegetation is removed. With low-impact solar, the topsoil is preserved and native plants and other beneficial vegetation to bees and other pollinators can be planted on the minimally disturbed ground after panels are installed.



National Renewable Energy Laboratory, Pollinator Friendly Solar.

September 2018, *via flickr*.

The deep roots of native vegetation retain more water than turf grass and gravel during heavy storms and periods of drought, preventing erosion. They also improve soil health over time, which then allows for carbon sequestration (Yang, Tilman, Furey, & Lehman, 2019). The native and flowering vegetation provides habitat for pollinators and other beneficial insects that improve yields for farmers and neighboring farms (Davis, 2017). Other benefits include higher energy output from panel efficiency gains due to the cooler microclimate created by perennial plantings; and lower operations and maintenance costs over the project lifetime, as compared to turfgrass (Siegnier, Wentzell, Urrutia, Mann, & Kennan, 2019). Also, studies by Oregon State University suggest agrivoltaics could benefit insect pollinators by increasing blooms and the diversity of insects (Graham, et al., 2021).

Policy, Programs, and Promising Models

The policy and program recommendations that follow were developed to achieve RE-AMP's North Star Goal of equitably eliminating greenhouse gas emissions in the Midwest by 2050. They attempt to address interconnections between climate, natural systems, and systemic social and economic inequities associated with current agricultural and food systems and practices. The promising models presented at the end of this report showcase organizations successfully working to tackle these challenges through farming. All three reflect opportunities for support and engagement by RE-AMP members and allies. Support for policy or legislation, programs, and models should be based on the guiding principles presented in Chapter 1, INTRODUCTION.

Revise the Farm Bill

The farm bill is federal legislation that is up for renewal every five years. It affects farmer livelihoods; how food is grown; and what food is grown, setting the stage for our food and farm systems. It covers programs that range from crop insurance for farmers to healthy food access for low-income families and children. The current bill expires in September 2023, and RE-AMP members and allies can ensure that the next bill incentivizes agriculture and food systems that equitably meet the Network's North Star Goal. The following modifications would help achieve that goal:

FARM SUBSIDIES:

- **Crop Insurance.** Overhaul the Federal Crop Insurance Program that keeps large-scale commodity farmers reliant on government payments rather than helping them build more resilient systems that would help protect farmers from extreme weather. Instead, offer lower premiums to farmers who adopt climate-smart practices that minimizes farmer risk by building healthy soil (see Chapter 4, OPPORTUNITIES FOR TRANSFORMATION, Practices). The USDA Risk Management Agency's recent **Pandemic Cover Crop Program** offered a \$5 per acre discount to help farmers maintain their cover crop systems, despite the financial challenges posed by the pandemic. This program is an example of an incentive that, if made permanent, could help increase the use of cover crops in the RE-AMP region.

- **Commodity Programs.** Revise commodity program payments, which provide incentives for growing commodity crops for animals and fuel (e.g., corn and soybeans) rather than food, and degrade the soil; pollute our water; destroy biodiversity and wildlife habitat; and release powerful greenhouse gases into the atmosphere. These payments also encourage farm consolidation and overproduction that benefit the largest farms to the detriment of small and mid-scale farms, beginning farmers, farmers of color, women farmers, and rural communities. When the food and agriculture system pushes farmers and agribusinesses to grow more crops, markets become flooded with those crops. This lowers prices and makes it harder for small and socially-disadvantaged farmers to turn a profit.

Instead, support policies that disassociate subsidies from protected, commodity crops. Incentivize crop diversification and encourage farmers to grow food for human consumption instead of commodity crops (fruits, tree nuts and vegetables currently are not eligible for subsidies). Fund practices that build healthy soil and provide ecosystem services. Adopt measures that limit production, stabilize prices, and ensure fair prices that cover the cost of the crops that are grown. Increase access to land, capital, and training for socially-disadvantaged farmers committed to producing local food, regeneratively; and meet the growing demand for healthier and more environmentally-friendly food choices. Together, these changes can revitalize rural communities; repair damaged ecosystems; and build healthy soils that can sequester carbon.

- **Conservation Programs.** Increase payments for all conservation programs, but particularly for the Conservation Stewardship Program (CSP) and the Environmental Quality Incentives Program (EQIP). Promote the Conservation Reserve Program (CRP), which was expanded in 2021 to increase enrollment and address climate change.
 - CSP offers farmers the opportunity to earn payments for actively managing, maintaining, and expanding conservation activities such as cover crops, rotational grazing, ecologically-based pest management, buffer strips, and the transition to organic food. It also helps address some of the inequities for socially-disadvantaged producers by providing opportunities to farm.

- EQIP provides financial and technical assistance to agricultural producers to deliver environmental benefits including: improved water and air quality; conserved ground and surface water; increased soil health and reduced soil erosion and sedimentation; improved or created biodiversity and wildlife habitat; and mitigation against drought and increasing weather volatility.
- CRP is one of the largest voluntary conservation programs that exists in the U.S. It has a track record of preserving topsoil; sequestering carbon; reducing nitrogen runoff; and providing habitat for wildlife. The USDA plans to increase rental rates and increase the number of climate-smart practices allowed to boost enrollment. These include tree and perennial grass plantings, wildlife habitat creation, and wetland restoration. Perennial grasslands, tree plantings, and wetlands are some of the most promising carbon sinks. Grasslands can store carbon below ground; trees store carbon in their biomass above ground, and wetlands can store carbon-rich sediments.

Acres enrolled in this program currently mitigate more than 12 million metric tons of carbon dioxide equivalent (CO₂e). If the USDA reaches its goal of enrolling an additional 4 million acres, the program could mitigate another 3 million metric tons of CO₂e and prevent 90 million pounds of nitrogen and 33 million tons of sediment from running into our waterways each year (U.S. Department of Agriculture, 2021).

- **Incentivize the Planting of Perennial Food Crops.** Perennial crops include fruit and nut trees; and grains (e.g., [Kernza](#), a domesticated wild grass that has a long, slender head that resembles wheat seeds). Fruit and nut trees store carbon in their biomass, and perennial grains store carbon in their deep roots. To a lesser extent, other perennial food crops can help build soil (e.g., asparagus, artichokes, sorrel, some forms of kale, etc.). Providing financial incentives for perennial vegetables produced locally and regeneratively also can provide consumers with nutrient-dense food, reducing food apartheid and supporting small and mid-size businesses (including cooperatives).
- **Limit Production.** Consider programs that limit production and provide guaranteed fair prices for farmers and ranchers. Overproduction creates more supply than demand, which lowers prices and diminishes farmer profit.

- **Broadband Internet.** High-speed broadband networks are central to following commodity markets and communicating with customers, vendors and suppliers, taking advantage of precision farming techniques that take into account soil moisture and plant health, and allowing farmers to complete government paperwork electronically. Without broadband, these tasks are less efficient.
- **Rural Energy for America Program (REAP).** Protect and expand the \$50 million mandatory funding included in the current farm bill for REAP, and work to maintain or increase the \$30.4 million appropriated by the Agriculture Committee FY 2022 over the next ten years. REAP helps farmers, ranchers, and rural businesses reduce their emissions by providing grants and loans to farmers and rural businesses interested in energy audits; energy efficiency improvements; and renewable energy development.
- **Supplemental Nutrition Assistance Program (SNAP).** Ensure SNAP (also known as food stamps) is maintained or expanded in the next Farm Bill. This program, as well as a variety of smaller nutrition programs, helps low-income Americans afford food for their families. Beginning October 2021, average benefits for all 42 million SNAP beneficiaries will increase more than 25 percent above pre-pandemic levels. According to the USDA, the increased assistance will be available indefinitely (U.S. Department of Agriculture, 2021).

Opportunities for Federal, State, and Local Action

Policy and program opportunities exist at all levels of government to help equitably eliminate greenhouse gas emissions in the Midwest by 2050 by following the guiding principles in Chapter 1, INTRODUCTION. Here are several that build on information presented in this report:

- **Enforce Antitrust Laws.** Organize to support the **Farm Systems Reform Act**, which would strengthen the enforcement of the Sherman and Clayton Antitrust and the Packers and Stockyards Act, or organize to pressure the Biden Administration to do the same, consistent with his pledge to “Build Back Better.” This would ensure farmers and producers have access to competitive markets where they can compete and receive fair prices for their products.
- **Reinstate Country of Origin Labeling.** Organize to support the **Farm Systems Reform Act**, which, in addition to helping enforce antitrust laws, also would reinstate country of origin labeling for meat. This would require meat companies to disclose where their beef and pork was born, raised, and slaughtered. Country of origin labeling would bring back laws and regulations repealed in 2015, once again providing more transparency to American shoppers, and giving American producers a competitive edge to U.S. markets.
- **Incentivize Soil Health.** Help develop, pass, and promote soil health legislation in RE-AMP states that pays producers who adopt practices designed to reduce greenhouse gas emissions; improve soil health that sequesters carbon and crop resilience; and provide ecosystem services described in Chapter 4, OPPORTUNITIES FOR TRANSFORMATION, Practices. The **U.S. State Healthy Soil Policy Map** provides information on legislation passed; in process; or policies under development within RE-AMP states. At the federal level, the following are examples of current legislative efforts that groups potentially could encourage their stakeholders to shape and support:
 - **Agriculture Resilience Act**, which sets a roadmap to achieve net-zero emissions from agriculture by 2040 and provides farmers the tools and resources needed to achieve the goals identified in Chapter 4, OPPORTUNITIES FOR TRANSFORMATION, plus opportunities to tap into new markets.

- **Farm Systems Reform Act**, which, in addition to addressing antitrust and country of origin labeling, would phase out concentrated animal feeding operations and give ranchers the opportunity to transition to raising animals on pasture or crop production.
- **THRIVE Act**, which would invest in local and regional food systems that support farmers, agricultural workers, healthy soil, and climate resilience.
- **Growing Climate Solutions Act**, which would increase transparency and set standard protocols for carbon payment programs.
- **Legislate Nutrient Management.** Encourage legislation that helps farmers identify the nutrient needs of a given crop or crops being planted to minimize nutrient runoff while still producing good yields. Provide incentives for farmers who adopt and implement nutrient management plans, and disincentives for those who do not.
- **Increase Access to Land for Black, Indigenous, and Other Farmers of Color:**
 - Organize to support the **Justice for Black Farmers Act**, which includes the issuance of 20,000 land grants consisting of up to 160 acres to eligible Black farmers each year in order to reverse decades of land loss.
 - Support the **American Rescue Plan Act's** payments of up to 120 percent of loan balances for Farm Service Agency loans to any “socially disadvantaged” producer with a qualifying loan. In USDA terms, “socially disadvantaged” includes Black, Hispanic, Native American, Asian American and other farmers of color. These payments could help them maintain or regain ownership of, or access to lands. Lawsuits brought about by white farmers have temporarily halted these payments, but the USDA has said it intends to continue debt relief.
 - Support legislation that creates a pathway to ownership of land as it transitions by investing in a succession from “Baby Boomer” farmers to the next generation of farmers (not multinationals), paired with education on soil health and business management and a focus on diversity.
- **Training.** Promote investing in statewide extension training and capacity building for farmers, prioritizing Black, Indigenous, and other farmers of color trying to gain access to such services.

- **Develop or Expand New Markets.** Help develop and promote policies that encourage farmers to diversify and implement regenerative farming practices. Examples include:
 - Creating paths for processing, marketing, and distributing perennial food crops. This would ensure farmers have markets for perennial grains and foods that not only can diversify farmer income, but also sequester carbon and improve ecosystems.
 - Expanding active supply chains, providing price signals for diversification. If supply chains for fungible commodities are supported by crop insurance, it's hard for farmers to pivot and invest in other areas.
 - Funding markets for healthy products grown locally and regeneratively, capitalizing on emerging niche markets. For example, plant-based foods, such as the “Impossible Burger” have a lower carbon footprint than beef, and low-cost foods such as organic dry beans are healthy, affordable, and appealing to broad audiences.
 - Decentralizing meat-processing plants to encourage production of livestock on farms and ranches (instead of CAFOs). This would help build healthy soil and increase jobs in rural communities, helping them to rebuild wealth.

- **Improve Equity in Agricultural and Food Systems:**
 - Support USDA reforms that end discriminatory lending practices, and provide relief or restitution for farmers of color and women farmers. This can include support for the **American Rescue Plan Act**, which includes loan forgiveness; and the **Justice for Black Farmers Act**, which requires USDA reforms to address decades of discrimination. Achieving this goal also may require placing additional pressure on the USDA.
 - **Organize to ensure fair wages** for farmworkers by increasing the consequences of wage theft for employers, improving the remedies available to workers, and strengthening wage theft enforcement tools. These are core strategies to realizing economic justice and respecting workers' dignity.
 - Organize to support those portions of the **THRIVE Act** that provide opportunities for family, Indigenous, and Black farmers and ranchers, rural communities, and urban agriculture by disentangling the hyper-consolidated food supply chain.

- Improve food security in communities of color experiencing food apartheid and who are most vulnerable to food shocks by bringing about the local production of food grown regeneratively by farmers of color and women through community and **conservation land trusts**. See Promising Models, below.
 - Support the **Child Nutrition Reauthorization Act**, a suite of programs that ensure low-income children in rural and urban communities have access to healthy food. Also, advocate access to the USDA's **Farm-to-School Grant Program** in RE-AMP Network communities. This program enriches the connection communities have with fresh, healthy food and local food producers by changing food purchasing and education practices at schools and early care and education settings.
 - Work with institutions and local governments in the RE-AMP footprint to encourage them to adopt values-based, good food purchasing policies that integrate local economies, nutrition, local workforce, environmental sustainability, and animal welfare. See Promising Models, below.
 - Use community planning and zoning processes to improve food security by promoting mobile food markets and mobile food pantries (e.g., Minneapolis), or establish urban agriculture overlay districts that allow urban agriculture and provide food and jobs for restaurants and cooperatives (e.g., Boston).
 - Encourage local governments and nonprofits to partner with community gardens and farmers to provide education (especially for youth) on healthy eating; opportunities for peace of mind/mental health; local jobs; and seeing oneself as a nurturer of the land.
- **Reduce Food Waste.** Adopt policies and/or programs that decrease food waste (e.g. composting). Require or provide incentives to compost, and ensure compost is used to produce food in residential and community gardens and farms.

“I’d like to see farmers growing everywhere. Everything. Urban agriculture. That’s how we’re going to beat this food crisis. We’ve got to come together.”

- JESSIKA GREENDEER, DREAM OF WILD HEALTH

Promising Models

There are a number of models that RE-AMP members and allies can support or replicate to help achieve the Network's North Star Goal. Many come from cities or organizations headquartered in RE-AMP states:

- **Land Access.** A number of programs exist that help provide access to land, capital and training. Most identified below encourage farming by young farmers and Black, Indigenous, and other farmers of color:
 - **Dream of Wild Health** (Minneapolis, MN) — Building an incubator farmer program for Native youth, coupled with a commercial kitchen for young, Native farmers to produce value-added products and sell them through farmers markets and the Indigenous Food Network.
 - **Iroquois Valley Farmland REIT, Evanston, IL.** This program works with mission-driven investors to provide organic and regenerative farmers land security through long-term leases and mortgages. Iroquois Valley Farmland (IQVF) is developing relationships with some organizations led by and in support of farmers of color. For example, they are working with the Black Oaks Center in Pembroke Township, IL to **develop a model** for underwriting loans to Pembroke's primarily Black farming community. Black Oaks Center is working to re-localize the area's local economy with perennial agriculture.
 - **Detroit Black Farmers Land Fund, MI.** Detroit has many Black farmers, but few who own their land. Two urban farmers decided to fund a campaign to raise money to help Black people in Detroit own the land where they farmed. They raised \$65,000 in less than one week and were able to provide funds to 30 farmers. A second campaign was initiated in April 2021.
 - **National Young Farmers Coalition.** This national organization works to ensure power and wealth will be returned to communities of Black, Indigenous, and other farmers of color that have faced historic and ongoing discrimination and dispossession of land, and that high-quality farmland with appropriate resources will be available, accessible, and affordable in an equitable way to all working farmers in the United States, with the security they need to achieve their farming goals.

- **Northeast Farmers of Color Land Trust.** Northeast Farmers of Color Land Trust is a hybrid model land trust. It brings together a community land trust model and a conservation land trust model to reimagine land access as well as conservation and stewardship of communities and ecosystems. Its goal is to advance land sovereignty in the Northeast region through permanent, secure, land tenure for Black, Indigenous, LatinX and Asian farmers and land stewards who will use the land in a sacred manner that honors their ancestor's dreams for sustainable farming, human habitat, ceremony, native ecosystem restoration, and cultural preservation.
- **Conservation Fund's Working Farms Fund.** This program is being piloted in Atlanta, Georgia and Chicago, Illinois, with the goal to expand this program to other cities nationwide. The fund is raising money for a multi-million-dollar revolving fund that will acquire farmland in metropolitan areas and place conservation easements on this land to permanently protect it from development and environmentally-harmful practices. The Conservation Fund will lease farmland to farmers with a 5-10 year path to ownership, selling them the land at the end of the lease term. The largest **employer in Atlanta** has committed to purchase these crops, providing farmers the assurance and security they need to make long-term, strategic investments in their business.
- **Land Banks.** Land banks can acquire, hold, and help develop vacant lots, abandoned buildings or foreclosures in areas where food apartheid exists and help transition them to food production instead of waiting for other uses, such as commercial and residential development to occur. **Buffalo Street Farm partnered** with the Detroit Land Bank Authority to expand their community- supported agriculture project on four vacant lots.
- **Dirt Capital Partners, NY.** This organization invests in farmland in partnership with farmers throughout the Northeast, promoting sustainable farmers' land access and security. They work with sustainable farmers who have the opportunity to grow and expand their business, but need long-term, secure land access.
- **Flanagan State Bank, IL.** Flanagan State Bank is family-owned and provides agricultural loans to smaller, more diversified operations, including those farmed regeneratively.

- **Cooperatives.** Use cooperatives to help bring about a more robust, just, food system. They can boost local economies while providing for collective decision-making and ownership. Examples include:
 - **Detroit People's Food Co-op** is a Black-led, community-owned grocery cooperative. The co-op's purpose is to provide improved access to healthy food and food education to Detroit residents.
 - **Dorchester Food Co-op** in Massachusetts is a grassroots initiative to build a community and worker-owned grocery store.
- **Local Production.** The **Good Food Purchasing Initiative of Metro Chicago** (based on the national **Good Food Purchasing Program**) works to ensure institutional food purchasing advances an equitable, healthy, fair, local, humane, and sustainable food system while creating good food access for all and normalizing values-based procurement across all community-based "anchor" institutions, such as hospitals; higher education institutions; cultural institutions; senior living facilities, and others.
- **Grazing.** The **Grazing Lands Conservation Initiative** (GCLI) was founded to provide high quality technical assistance on privately-owned grazing lands to increase the awareness of the importance of grazing land. **GCLI Wisconsin** focuses on helping new graziers begin using rotational grazing methods. Trained grazing specialists work with farmers to develop grazing plans, including seeding, fencing, and watering.
- **Agrivoltaics:**
 - **USDA / University of Illinois Partnership.** The U.S. Department of Agriculture (USDA) has announced funding for a new project to optimize design for "agrivoltaic" systems — fields with both crops and solar panels — that will maintain crop production, produce renewable energy, and increase farm profitability. This \$10 million, four-year project, with the University of Illinois Urbana-Champaign as lead, will study agrivoltaics in a variety of land types and climate scenarios.
 - **University of Massachusetts Crop Research and Education Center.** UM's Crop Research and Education Center has built a photovoltaic array that is raised far enough off the ground and spaced to allow crops to grow around and beneath the panels. The goal of this project was to help farmers diversify their income through renewable energy generation, while keeping land in agricultural use and reducing greenhouse gas emissions.

- **Low-Impact, Pollinator Solar.** The Innovative Site Preparation and Impact Reductions on the Environment (**InSPIRE**) is collecting data on the performance of pollinator-friendly solar, as well as region-specific benefits and tradeoffs. Four low-impact pollinator projects are located in Minnesota, and one in Wisconsin (**InSPIRE Project Sites**). Low-Impact solar, which includes minimal land disturbance and deep-rooted perennial plantings that attract pollinators and sequester carbon, has an important role to play in regenerative agriculture, while also providing clean power for farmers and communities.
- **Tribal Conservation Advisory Councils** can provide a forum for federally-recognized Native American Tribes on natural resources and conservation issues. Tribal Conservation Advisory Councils were first authorized in response to the 1995 Farm Bill as advisory bodies to NRCS and all of USDA on Tribal issues. An example of a successful Tribal Advisory Council in the RE-AMP region is the **Wisconsin Tribal Conservation Advisory Council** (WTAC) which has a strong partnership with the USDA-NRCS. It reviews and makes recommendations for proposed conservation projects in the state. The WTCAC was the first such council formed in the country.



CHAPTER 5

CONCLUSION

RE-AMP states have a responsibility and opportunity to lead in reducing the climate impacts of agriculture and food systems, while promoting healthy food, farms, and communities at the same time.

Call to Act

The severe drought hitting Midwestern farmers this summer is only the latest example of how the climate crisis is intersecting with agriculture and food systems. It is affecting farmers and ranchers of all sizes and types, whether growing crops or raising animals. And it is affecting our food systems, whether local farmers markets or school lunches.

Midwesterners have an enormous responsibility and opportunity to lead on emission reductions, while also building resilience to the effects of climate change through regenerative food and agriculture systems. A new approach to these systems in the Midwest can also repair historic harms; rebuild and reshape the rural landscape; support healthy, thriving Midwestern communities; empower farmers; increase access to affordable, healthy foods, and much more.

As climate policy more broadly builds at the national and state level, it is critical that agriculture and food systems are not left out. New ideas are emerging at the national, state, and local level, but there is more work needed to build a new, equitable climate-food system policy framework. Agriculture and food systems intersect directly with longstanding issues of equity, such as who owns and farms land; who works within the food system and under what conditions; who profits (farmers, workers, or large corporations); and who has access to healthy food. They also affect the quality of ecological systems, including soil, water quality, biodiversity, and wildlife habitat. To embed equity within climate action in Midwest states, it is essential to move beyond policy to include other levers of systems change, such as: mindset shifts; shifts in who wields power and how it is used; relationships and connections; and practices.

While drought, flooding, and increased temperatures already are driving many changes in agriculture and food systems, they are not happening quickly enough to stabilize our rapidly-changing climate. That is why this is a critical time for RE-AMP members to engage in shaping and driving a responsive policy framework that reduces greenhouse gas emissions from these systems. Together, these systems produce CO₂, CH₄, and N₂O. Methane and N₂O, make up the majority of emissions from agriculture in the Midwest, and RE-AMP states are responsible for 42 percent of all agricultural emissions. Because these emissions are more potent than CO₂, they have a greater impact on warming in the short-term.

Urgency

As recent reports from the Intergovernmental Panel on Climate Change have noted, the window in which to act to keep emissions below 1.5°C — the threshold climate scientists believe is necessary to avoid catastrophic climate change — is closing. Immediate action is essential to avoid an acceleration of catastrophic increases in flooding, recurring drought and damaging storms — all of which will have devastating social, economic and environmental effects on farmers and communities in Midwestern states. Working to transform agriculture and food systems in the Midwest is a critical next step toward equitably achieving the Network’s North Star goal.

This report can be used as a springboard to begin work in this area because it provides tools and resources that can be adapted to respond to opportunities, capacity, and differences in geographic and politics that exist between member states. By acting together now, RE-AMP Network members and allies can do their part to help stabilize our climate, while also addressing social and economic inequities, revitalizing once-vibrant communities, and restoring vital ecological systems in the Midwest.

“We need the pre-policy work, social movement/political work that advances policy. If we focus first on policy we end up accepting the power balance as it is rather than organizing to change the power balance.”

- MATT RUSSELL, FARMER, AND EXECUTIVE DIRECTOR
OF IOWA INTERFAITH POWER AND LIGHT

APPENDIX 1 - Report Tables

Table 1
NO-TILL AND COVER CROP PRACTICES IN RE-AMP STATES, 2017

	NO-TILL				COVER CROPS			
	Farms	% Farms	Acres	% Acres	Farms	% Farms	Acres	% Acres
Illinois	21,979	30.3%	6,471,985	24.0%	6,084	8.4%	708,105	2.6%
Iowa	24,025	27.9%	8,196,199	26.8%	8,729	10.1%	973,112	3.2%
Kansas	16,283	27.8%	11,197,898	24.5%	3,256	5.6%	556,439	1.2%
Michigan	8,174	17.2%	1,566,334	16.0%	6,275	13.2%	703,481	7.2%
Minnesota	5,815	8.4%	1,091,337	4.3%	5,302	7.7%	579,147	2.3%
North Dakota	5,548	21.0%	7,778,463	19.8%	2,252	8.5%	404,267	1.0%
Ohio	20,537	26.4%	4,268,627	30.6%	8,567	11.0%	717,759	5.1%
South Dakota	7,774	25.9%	7,656,188	17.7%	2,154	7.2%	281,649	0.7%
Wisconsin	14,665	22.6%	2,227,504	15.6%	7,933	12.2%	611,231	4.3%
RE-AMP States	124,800	23.4%	50,454,535	20.2%	50,552	9.5%	5,535,190	2.2%
United States	279,370	13.7%	104,452,339	11.6%	153,402	7.5%	15,390,674	1.7%
RE-AMP States % U.S.		44.7%		48.3%		33.0%		36.0%

Source: Land Use Practices by State (U.S. Department of Agriculture, 2019)

Table 2a
FARM OPERATORS, RE-AMP STATES, BY GROSS CASH FARM INCOME

State	Number	Small \$150,000 to \$349,999	S <\$350,000	Mid-Size \$350,000 to 999,999	Large \$1,000,000 to -\$4,999,999	Very large \$5,000,000 and more	Non-Family Any \$\$
Illinois	72,651	49,273	8,222	7,776	3,164	121	4,095
Iowa	86,104	53,559	11,754	12,103	3,946	364	4,378
Kansas	58,569	43,771	5,239	4,625	1,884	114	2,936
Michigan	47,641	39,075	2,785	2,575	1,239	152	1,815
Minnesota	68822	47571	7830	7452	3204	242	2523
North Dakota	26,364	14,859	3,425	4,451	2,468	55	1,106
Ohio	77,805	64,489	5,415	3,684	1,134	87	2,996
South Dakota	29,968	16,992	4,762	4,600	1,977	131	1,506
Wisconsin	64,791	49,989	6,195	4,232	1,664	180	2,531
Totals	532,715	379,578	55,627	51,498	20,680	1,446	23,886

Source: Farm Typology (U.S. Department of Agriculture, 2019)

Table 2b
LAND IN FARMS, RE-AMP STATES, BY GROSS CASH FARM INCOME

State	Number	Small \$150,000 to \$349,999	Small <\$350,000	Mid-Size \$350,000 to 999,999	Large \$1,000,000 to -\$4,999,999	Very large \$5,000,000 and more	Non-Family Any \$\$
Illinois	27,006,288	4,501,864	3,859,340	7,966,102	7,481,012	772,920	2,425,050
Iowa	30,563,978	5,368,376	4,808,631	10,690,217	6,641,222	775,037	2,280,495
Kansas	45,759,319	10,794,648	7,295,316	13,131,043	9,520,549	715,085	4,302,678
Michigan	9,764,090	3,138,771	1,154,617	2,075,745	2,042,662	453,992	898,303
Minnesota	25,516,982	5,884,181	3,467,687	7,061,640	6,703,980	716,985	1,682,509
North Dakota	39,341,591	6,310,538	5,601,448	12,483,719	12,279,119	613,503	2,053,264
Ohio	13,965,295	4,980,565	2,130,932	3,199,612	2,225,973	224,782	1,203,431
South Dakota	43,243,742	7,017,314	8,520,590	12,629,319	10,316,879	2,001,358	2,758,282
Wisconsin	14,318,630	5,137,532	2,212,936	2,780,404	2,407,833	577,045	1,202,880
Totals	249,479,915	53,133,789	39,051,497	72,017,801	59,619,229	6,850,707	18,806,892

Source: Land Use Practices by state (U.S. Department of Agriculture, 2019)

Table 2c
MARKET VALUE OF AGRICULTURAL PRODUCTS SOLD AND GOVERNMENT
PAYMENTS - RE-AMP STATES, BY GROSS CASH FARM INCOME

State	(\$1,000)	Small \$150,000 to \$349,999	Small <\$350,000	Mid-Size \$350,000 to 999,999	Large \$1,000,000 to -\$4,999,999	Very large \$5,000,000 and more	Non-Family Any \$\$
Illinois	17,531,201	1,344,694	2,075,532	5,083,125	5,717,100	1,122,374	2,188,376
Iowa	29,639,450	2,029,447	3,552,723	8,775,274	8,021,433	4,216,370	3,044,203
Kansas	19,291,930	1,135,815	1,244,325	2,957,716	3,654,695	3,434,267	6,865,112
Michigan	8,388,124	696,282	654,552	1,553,701	2,355,064	1,927,668	1,200,857
Minnesota	18,789,881	1,522,650	2,198,145	4,961,849	5,963,969	2,523,328	1,619,940
North Dakota	8,701,156	395,436	725,854	2,583,484	3,895,599	402,746	698,037
Ohio	9,692,350	1,458,726	1,582,866	2,454,945	2,041,714	1,133,490	1,020,609
South Dakota	10,141,030	533,242	1,047,164	2,675,848	3,492,812	1,093,783	1,298,181
Wisconsin	11,554,005	1,195,372	1,468,734	2,420,632	3,185,280	1,835,968	1,448,019
Totals	133,729,127	10,311,664	14,549,895	33,466,574	38,327,666	17,689,994	19,383,334

Source: Farm Typology (U.S. Department of Agriculture, 2019)

Table 3
PRODUCTION OF CORN AND SOYBEANS IN THE NINE RE-AMP STATES

RE-AMP STATES	Corn (bushels)	% Corn	Soybeans (bushels)	% Soybeans
Illinois	1,846,200,000	13%	532,440,000	15%
Iowa	2,583,900,000	19%	501,600,000	14%
Kansas	800,660,000	6%	186,335,000	5%
Michigan	239,890,000	2%	70,930,000	2%
Minnesota	1,263,240,000	9%	297,880,000	8%
North Dakota	455,430,000	3%	174,400,000	5%
Ohio	421,480,000	3%	209,230,000	6%
South Dakota	566,950,000	4%	146,200,000	4%
Wisconsin	450,240,000	3%	79,900,000	2%
RE-AMP TOTAL	8,627,990,000		2,198,915,000	
US TOTAL	13,691,561,000		3,558,281,000	
RE-AMP % U.S.		63%		62%

Source: National Agricultural Statistics Service (U.S. Department of Agriculture, 2020)

Table 4
LAND IN PASTURE AND RANGELAND

RE-AMP STATES	Land in Pasture (acres)	Land in Rangeland (acres)	Land in Pasture and Rangeland (acres)	% Land in Pasture and Rangeland
Illinois	2,276,800	-	2,276,800	0.6%
Iowa	3,346,500	-	3,346,500	0.8%
Kansas	3,077,800	15,585,300	18,663,100	4.7%
Michigan	2,186,200	-	2,186,200	0.5%
Minnesota	3,703,700	-	3,703,700	0.9%
North Dakota	2,409,000	10,660,500	13,069,500	3.3%
Ohio	2,045,800	-	2,045,800	0.5%
South Dakota	18,149,800	22,341,100	40,490,900	10.1%
Wisconsin	2,987,600	-	2,987,600	0.7%
RE-AMP TOTAL	40,183,200	48,586,900	88,770,100	
US TOTAL			400,771,178	
RE-AMP % U.S.				22.1%

Sources: 2017 National Resources Inventory by State (U.S. Department of Agriculture, 2017)

Table 5
INCREASE IN CONCENTRATED ANIMAL FEEDING
OPERATIONS IN RE-AMP STATES

RE-AMP STATES	2011	2017	2019	Percent change (2011 to 2019)
Illinois	500	297	297	-41%
Iowa	1,648	3,588	3,744	127%
Kansas	447	424	429	-4%
Michigan	220	309	310	41%
Minnesota	1,255	1,300	1,450	16%
North Dakota	76	76	76	0%
Ohio	192	206	262	36%
South Dakota	408	431	431	6%
Wisconsin	233	315	324	39%
RE-AMP TOTAL	4,979	6,946	7,323	47%
US TOTAL	18,540	19,961	20,883	13%
RE-AMP % U.S.	27%	35%	35%	

Source: NPDES CAFO Permitting Status Report for 2019 (U.S. Environmental Protection Agency, 2020)

Table 6
FARM SUBSIDIES, RE-AMP NETWORK STATES, 2016-2020

	2016	2017	2018	2019	2020	2016-2020
RE-AMP STATES	(billions \$)	(billions \$)	(billions \$)	(billions \$)	(billions \$)	(billions \$)
Illinois	1.450	0.956	1.380	2.080	0.627	6.493
Iowa	1.370	1.010	1.480	2.340	0.936	7.136
Kansas	0.899	1.000	1.120	1.780	0.531	5.330
Michigan	0.288	0.304	0.322	0.464	0.177	1.555
Minnesota	0.899	0.756	1.100	1.610	1.610	5.975
North Dakota	1.130	1.140	1.260	1.570	0.307	5.407
Ohio	0.598	0.502	0.570	0.247	0.849	2.766
South Dakota	0.852	0.947	1.120	1.300	0.404	4.623
Wisconsin	0.384	0.245	0.403	0.598	0.448	2.078
TOTALS	7.870	6.860	8.755	11.989	5.889	41.363
US TOTALS	17.200	16.200	18.000	26.900	9.570	87.870
RE-AMP % U.S. TOTALS	45.8%	42.3%	48.6%	44.6%	61.5%	47.1%

Source: EWG Farm Subsidy Database (Environmental Working Group, 2020)

Table 7

NUMBER OF FARMS AND AVERAGE FARM SIZE, 2010 AND 2020, RE-AMP STATES

RE-AMP STATES	2011	2017	2019	Percent change (2011 to 2019)
Illinois	500	297	297	-41%
Iowa	1,648	3,588	3,744	127%
Kansas	447	424	429	-4%
Michigan	220	309	310	41%
Minnesota	1,255	1,300	1,450	16%
North Dakota	76	76	76	0%
Ohio	192	206	262	36%
South Dakota	408	431	431	6%
Wisconsin	233	315	324	39%
RE-AMP TOTAL	4,979	6,946	7,323	47%
US TOTAL	18,540	19,961	20,883	13%
RE-AMP % U.S.	27%	35%	35%	

Land in farms consists of agricultural land used for crops, pasture, or grazing.

Sources: Farms, Land in Farms, and Livestock Operations 2010 Summary (U.S. Department of Agriculture, 2011);

Number of Farms, Land in Farms, and Average Farm Size – States and the U.S.: 2020-2021 (U.S. Department of Agriculture, 2021)

Table 8
FARM PRODUCERS BY RACE, GENDER, ETHNICITY, AND AGE

Producers by Race and Ethnicity		Producers by Age	
White	96.0%	Younger than 35	8%
Black	1.3%	Ages 35-64	58%
Native American	1.7%	65 and older	34%
Hispanic	3.3%	Average age	57.5 years
Producers by Gender		Average age	57.5 years
Male	64%		
Female	36%		

Source: 2017 Census of Agriculture (U.S. Department of Agriculture, 2019)

Table 9
U.S. AGRICULTURAL LANDHOLDINGS, NON-U.S. OWNERSHIP, 2019

	Total Land Area (acres)	Privately Held Agricultural Land (acres)	Non-U.S. Ownership (acres)	Percent Privately Held, Non-U.S. Ownership (acres)
Illinois	35,573,760	30,536,400	635,395	2.1%
Iowa	35,756,160	33,340,369	386,597	1.2%
Kansas	52,361,600	49,188,971	937,964	1.9%
Michigan	36,354,560	24,098,445	1,341,170	5.6%
Minnesota	50,950,400	34,530,621	520,741	1.5%
North Dakota	44,144,640	38,548,498	302,715	2.1%
Ohio	26,206,720	21,566,008	485,433	2.3%
South Dakota	48,566,400	37,939,910	306,601	0.8%
Wisconsin	34,758,400	25,067,954	476,241	1.9%
Totals	364,672,640	294,817,176	5,392,857	1.8%

Source: Foreign Ownership of U.S. Landholdings (U.S. Department of Agriculture, 2019)

APPENDIX 2 - Persons Interviewed

The following is a list of persons interviewed for this report, from October 2020 through December 2020.

Weslynn Ashton, Illinois Institute of Technology	Coalition	Mark Muller, Regenerative Agriculture Foundation
Renata Brillinger, CalCAN	Mitchell Hora, Continuum Ag	Tom Nuessmeier, Land Stewardship Project
Traci Bruckner, Sustainable Ag and Food Systems Funders	Randall Jackson, University of Wisconsin, Madison	Jose Oliva, HEAL Food Alliance
Rebekah Carlson, Nori	Margaret Krome, Michael Fields Agricultural Institute	Matt Schmitt, Cargill
Sarah Carlson, Practical Farmers of Iowa	Winona LaDuke, Honor the Earth	Ed Smith, Center for American Indian Studies/Johnson County Community College
Fred Carter, Black Oaks Center	Claire Lafave, Regenerative Agriculture Initiative	Don Stull, Professor Emeritus, Anthropology, University of Kansas
Graham Christensen, GC Resolve	Rattan Lal, Ohio State University	Aimee Witteman, McKnight Foundation (Formerly NSAC)
Chris Clayton, DTN Progressive Farmer	Karen Lehman, Fresh Taste	Malik Yakini, D-Town Farms, Detroit Black Community Food Security Network
Adam Davis, University of Illinois, Champaign	David LeZaks, Croatan Institute	
Rob Davis, Fresh Energy	Jonathan Lundgren, Blue Dasher Farm (formerly USDA)	
Del Ficke, Indigo Ag & Cattle Farmer	Aaron Marks, Project RALLY	
Mary Fund, Kansas Rural Center	Tina May, Land O'Lakes	
Jessika Greendeer, Dream of Wild Health	Donna McClish, Common Ground	
Mary Hendrickson, University of Missouri	Liz Moran-Stelk, Illinois Stewardship Alliance	
Oran Hesterman, Fair Food Network		
Ferd Hoefner, National Sustainable Agriculture		

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