From Climate Pledges to Transformative Action

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Agriculture is an essential human endeavor fundamentally dependent on the environment. From the soil to sunlight, roots to rainfall, every aspect of producing food requires natural processes. Even innovations in the sector like vertical growing and hydroponic systems depend on mimicking nature's processes. Because of this, agriculture faces imminent threats from climate change. Compounding this precariousness is the somewhat paradoxical fact that food systems contribute over one-third of the world's greenhouse gas (GHG) emissions. Yet food systems are also a powerful potential vehicle for achieving climate goals and present an opportunity to integrate climate mitigation and climate adaptation. Many practices meant to help farmers adapt to a changing climate provide mitigation benefits, and vice versa.

The momentous 2021 global convenings on food, climate change, and nutrition—the United Nations Food Systems Summit (UNFSS), United Nations Climate Change Conference (COP26), and the Nutrition for Growth Summit—each prompted new initiatives and funding commitments. But promises alone, no matter how bold or big, are not enough to transform the global food system, end hunger, and prevent climate catastrophe. Acknowledging the unprecedented potential of recent commitments and international attention given to food systems and climate change, the Chicago Council on Global Affairs convened an expert roundtable with representatives from the private, public, academic, and nonprofit sectors to move beyond abstract goals to identify concrete actionable steps for US agrifood stakeholders. This paper outlines three key areas for action that were identified through the roundtable and offers recommendations to the private sector, donor community, civil society, academia, and government.

Key Issues to be Addressed by UNFSS and COP26 Commitments

Despite food systems' enormous sustainability potential, they remain sidelined in major climate conversations. The 2021 United Nations Climate Change Conference

(COP26) organized its convenings around daily themes that notably excluded food and agriculture but included transportation—a sector that contributes 10 percent fewer GHG emissions globally than agriculture.[1] The exclusion is all the more puzzling given the unprecedented attention given to food systems via the UNFSS, held in September 2021. At the summit, the Biden administration pledged $10 billion over five years to strengthen domestic and global food systems and joined 11 global coalitions as a strategic partner. These commitments include a new domestic strategy for climate-smart agriculture and forestry, and AIM for Climate (AIM4C), a new international initiative for climate-smart innovation, co-led with the United Arab Emirates. Yet much of the pledged $10 billion is not a new investment but rather existing funding directed toward new and prior initiatives.

US COP26 commitments with agricultural implications homed in on forests and methane, marked by new pledges and plans to reduce methane by 30 percent and end deforestation by 2030. These begin to address key challenges that must be resolved to achieve a sustainable, just transformation of food and fiber systems: agricultural deforestation, forest health, and excess methane produced by certain livestock practices. Yet more work remains for the United States' COP26 and UNFSS pledges.

The commitments from the US government, private sector, and civil society organizations are important signals of good intentions. Building a more resilient, equitable food system will need action as well as good intentions, and new investments in addition to revamping prior commitments. Additionally, it is important to note that with the United States being a major producer in a thoroughly globalized food system and the second-greatest GHG emissions contributor, its domestic policy choices have international ramifications. The division between "over there" and "here at home" no longer applies to actions that either accelerate or mitigate anthropogenic climate change. Domestic US agricultural policies to improve the sector's sustainability will ease the global climate burden that disproportionately affects smallholder farmers around the world, as well as set an example for other nations' implementation of UNFSS commitments.[i]

Three key challenges need to be addressed for the US commitments to move from intentions to transformative, climate-friendly actions. The first is a collection of federal policies: subsidies, crop insurance, and procurement practices. Second are livestock production methods, a key contributor to global methane. And the third is blue foods, an often-overlooked area for growth in sustainable food production. Each of these policy arenas needs critical attention in order to fully harness food systems' potential for climate change solutions. Addressing any one single area would be helpful for creating a food system that heals rather than harms the planet, but climate-conscious food systems resilience cannot be completed without addressing all three.

[i] Integrating social considerations, such as the effects of the United States' GHG emissions on low- and middle-income countries and viable agricultural livelihoods for all producers, into domestic food policy aligns with the principles of agroecology. This holistic approach integrates health, environment, and food concerns.

Subsidies, Crop Insurance, and Procurement Policies

Current US agricultural entitlement programs, such as commodity price supports and crop insurance, provide a crucial, multibillion-dollar safety net for farmers.[2] The national and global food supply is fraught with uncertainty and risk: anything from unusual rains, an international trade dispute or a pandemic can threaten a farmer's livelihood. This reality makes any change—be it a new conservation-oriented practice, crop, or input—especially concerning for producers.

Government support to help farmers navigate agriculture's myriad risks is a cornerstone of the US food system. Yet some of these programs can also serve to reinforce and incentivize the environmentally damaging agricultural status quo. Recent analysis from the UN Food and Agriculture Organization (FAO) found that 87 percent of global government subsidy support for agricultural producers is inefficient and inequitable, degrades the environment, distorts food prices, and hurts human health. As climate change intensifies and becomes increasingly variable, however, revised and targeted new programs are a unique opportunity to de-risk the transition to climate-smart agriculture practices. By reevaluating commodity subsidies and crop insurance, the United States can lead the world in supporting farmers while mitigating climate change and protecting consumers' food supply.

Rethinking commodity subsidies could not only provide critical support to farmers as they shift to conservation-based practices but also provide nutritional and economic benefits. Commodity-related support programs are primarily allocated to major row crops—the majority of which are used to feed animals—and dairy. If these programs were realigned and expanded to include specialty crops like fruits and vegetables, it could incentivize greater farmer investment in healthy foods. An increased supply of fruits and vegetables would push down prices for the consumer, thus increasing the accessibility of micronutrient-dense foods. Increased investment in the production of fruits and vegetables like leafy greens would also expand the geographic area in production, helping to ensure supply through disasters and increasing the resilience of the US food system.

Moreover, recent evidence shows that every dollar spent on current agricultural practices returns less than one dollar to the economy, while spending on sustainable land uses that support biodiversity conservation, such as cover crops and removing or rotating land in production, can generate up to seven additional dollars in economic activity per dollar spent.[3] These commodity subsidies are tied to production and factors of production, which results in larger farms receiving more support. Because white farmers own the majority of farms and acreage in the US, the majority of payments tied to factors of production end up reinforcing broader systemic racial inequalities. If policymakers take this into account when reconsidering commodity support programs, they can begin to address axes of inequality in the agricultural community while addressing the climate crisis.

Crop insurance, a key mechanism for de-risking a fundamentally risky industry, is another opportunity for supporting farmers as they shift to climate-smart agricultural practices. The changing climate is an urgent threat facing agriculture and is already a major source of risk and loss—for example, temperature trends contributed to nearly 20 percent of national-level crop insurance losses from 1991–2017.[4] This correlation

points to a potential increase in demand for insurance, adaptation assistance, and protection as global temperatures rise or fall. Conservation-oriented farming practices like cover cropping, crop rotation, and no-till farming can serve to reduce the need for crop insurance by mitigating climate change and increasing crop resilience. If crop insurance were expanded and partially reoriented to incentivize climate-smart and agroecological practices, it could result in savings of billions of taxpayers' and farmers' dollars over the long term.

In addition to subsidies and crop insurance, procurement policies for publicly funded institutions, such as schools, offer another potential mechanism for transforming existing policy into climate mitigation. Creating infrastructure necessary for local and regional food supply will reduce emissions generated in transportation, including fuel and energy needed to keep perishable crops from spoiling. In fact, local and regional food systems are the focus of one of the 26 coalitions that emerged from UNFSS. By establishing local procurement policies, like the Good Food Purchasing Program adopted in six states and nine cities, public institutions can invest in building up local and regional food systems.[5] These policies can be used to support new producers, and producers of color, both urban and rural, thus providing an additional lever for addressing systemic inequities in the food system.

Livestock Production

Animal agriculture accounts for 42 percent of US agriculture's total GHG emissions, with cattle and dairy production[ii] accounting for 31 percent of the nation's total methane emissions.[6] Global livestock production accounts for 76 percent of agriculture's GHG emissions[7] with cattle and dairy responsible for about one third of anthropogenic methane emissions.[8] Given livestock's contributions, agriculture has been rightly identified as one of five key areas for action in the United States' Methane Reduction Action Plan.[9] Animal protein consumption is on the rise around the world, with a corresponding increase in negative effects on human and planetary health. In the United States, per capita meat consumption has risen every year since 2015, with poultry consumption increasing more rapidly compared to beef, reaching 264 pounds of meat per person in 2020.[10] The United States leads in global meat production and consumption and is thus positioned to lead new global standards in production practices that can address environmental, health, and ethical concerns.[iii]

With strategic changes, the livestock sector can transform from a major GHG emitter to a leader in climate change mitigation and food systems transformation. There are many opportunities for climate change adaptation and mitigation in livestock production including a reduction in consumption in high-income countries.

[ii] The United States is the world's second largest dairy producer and has the fourth largest milk-producing herd. This is a credit to the efficiency of the US dairy industry, but does not obviate the need for further improvement.

[iii] Current production practices, such as the use of concentrated animal feeding operations and meat processing facilities, also raise other critical environmental, health, and ethical concerns. These include, but are not limited to, issues related to farm labor and working conditions, impact of antibiotic overuse on human and animal health, reducing nutrient runoff into waterways, and consolidation of large agribusiness conglomerates. While outside the main focus of this paper, these and other issues will be essential to address if we seek transformations in our food system.

Technological advances that reduce methane output while also reducing water, fertilizer, and pesticide use in feed grain production are important for reducing livestock's environmental burden. These advances would benefit producers in the United States and around the world, and building out incentives for technological innovation in feed and livestock production is another key area to be addressed. Anaerobic methane digesters convert manure into biogas, and their widespread adoption at concentrated animal feeding operations (CAFOs) would provide farmers with an alternative source of heat and electricity while reducing water and air pollution. Anaerobic digesters often produce more energy than is needed for farm and digester operations.[11] With broad digester use, farms and CAFOs could double as renewable energy sources, bringing rural areas to the forefront of sustainability.

In addition to pursuing technological solutions that mitigate the effects of current livestock production, finding new, or returning to old, practices can help transform the sector. US meat and dairy production has steadily intensified since the 1950s, with most livestock now raised in CAFOs.[12] CAFOs have resulted in some efficiency gains for the industry, allowing more animals to be raised on less land more quickly. However, the manure produced by animals raised in CAFOs is an environmental and health concern for those living nearby,[13] and animals in these environments consume feed typically grown elsewhere under input-intensive conditions.[14] Methane digesters and innovative feed will reduce the emissions of CAFOs, but supporting alternative methods for raising livestock is important as well. This includes pasture-based and rotational grazing, as well as agroecological practices. Providing farmers with support to explore new and alternative production methods and techniques should be considered as part of the overall methane reduction strategy. Providing support to make small-scale meat and dairy production a viable source of income will lessen the push for larger operations, resulting in a more sustainable balance.

Greater Investment in Blue Foods

There are 2,500 species of aquatic animals, plants, and algae that are essential sources of protein in the diets of over three billion people worldwide, collectively known as "blue foods."[15] Two-thirds of blue foods consumed are produced by small-scale fisheries and aquaculture.[16] Despite the diversity available, blue foods are under-consumed in the United States compared with land-based animal protein sources. In 2017, fish and shellfish accounted for just 7 percent of the per capita supply of red meat, poultry, and fish/shellfish available to American consumers.[17] Increased investment in blue foods presents an opportunity to expand and improve the nutritional intake of the US population[18] while easing pressure on environmentally intensive livestock production and generating global climate solutions.

But key sustainability concerns will need to be addressed in order to fully mainstream blue foods. Marine fishing is an inherently global act, and it is important to consider the global consequences of overdrawing the oceans. At least one-third of global fish stocks are overfished,[19] and the National Oceanic and Atmospheric Administration (NOAA) designated 89 percent of all main US fish stocks as fished beyond their sustainable limit in 2020.[20] Given the predominance of small-scale fisheries and aquaculture, US marine actions directly affect the livelihoods of global producers most at risk from climate change.

In order to protect the oceans and the people who depend on them, rising global demand for blue foods cannot be sustainably met without significant investment in sustainable aquaculture. Many blue foods species can be farmed at emissions levels lower or equal to wild capture, making aquaculture a viable pathway to rebuilding oceanic fish stocks.[21] Additionally, fed aquaculture[22] species often have lower environmental impact than intensively produced poultry in the United States, which is already the lowest-impact livestock. Performing better than an environmentally intensive industry does not mean that aquaculture cannot be improved, however.

Aquaculture feed is a primary source of the sector's emissions, and thus both a critical opportunity to increase the sector's sustainability and an avenue for delivering on the United States' COP26 pledge to end deforestation. Switching global aquaculture feed to deforestation-free soy and corn crops or insect-based supplements could reduce the practice's GHG emissions by up to 50 percent. This switch, as well as greater adoption of other innovative feeds such as grass, will require significant investment in supply chain transparency around the world. The United States imports 70–85 percent of its blue foods, and half of these imports are produced via aquaculture.[23] These global supply chains can obscure harmful practices in early stages of production, for example, farmed seafood that is exclusively fed soy grown on deforested land in the Amazon. Industry commitments to complete supply chain transparency to guarantee sustainable aquaculture feed are an important step toward achieving emissions reductions in blue food production.

Innovations in aquaculture represent enormous opportunities for achieving US climate goals, creating jobs, and producing blue foods. Aquaculture is among the fastest-growing food-production industries,[24] and efforts are needed to ensure equal ability to enter the field. Funders in the donor community and federal government will need to consider earmarking aquaculture grants for historically and presently marginalized groups in the United States.

Challenges and Opportunities for Action

Communication among the private sector, the public sector, and consumers is a core challenge facing food systems transformation. It is important that civic engagement groups, nongovernmental organizations (NGOs), the federal government, and the private sector come together to collaborate on science-based public education campaigns that integrate food systems into climate change discourse. This should include emphasizing the existential threat that climate change poses to global food systems, and education on the harm our current food system inflicts on the planet and the potential for positive transformational climate change mitigation through advanced food and agriculture systems thinking and identifying old practices that no longer make climate sense. Pursuing an integrated food systems policy strategy, rather than addressing the issue through separate climate and agriculture policies, will help further bridge communication gaps. An integrated food systems strategy could support farmers and other stakeholders in pursuing practices that achieve multiple goals simultaneously, including preserving biodiversity, improving farmers' livelihoods, protecting and managing water resources, and reducing food insecurity. It is worth noting that such an approach is already named and established: agroecology. This system considers health, food, and environmental concerns to be

inextricably linked, and seeks to address all three simultaneously. Learning from already-established practices is vital, alongside exploring new innovations in the field.

Another aspect of food systems communication challenges is the question of animal protein consumption. Many climate advocates in high-income countries have called for a complete cessation of animal-sourced foods consumption. While a reduction in global consumption would help ease some of the sector's contributions and have positive some health benefits, context is vitally important. Evidence shows that animal-sourced foods provide nutrients that can be transformational in the cognitive development of children ages 6–23 months.[25] With an estimated 22 percent of children worldwide affected by stunting, a global elimination of animal-sourced foods would negatively affect the cognitive and physical development of millions. Livestock supports the livelihoods of over 1.3 billion people around the world. For many communities in low- and middle-income countries (LMICs) livestock are key not only to providing families with their livelihood but also to ensuring adequate nutrition, especially for children. There is no one-size-fits-all solution to the question of animal protein consumption, and conversations need to recognize that context will determine what solutions are viable.

Creating opportunities for small businesses, especially women- and minority-led businesses, is another core challenge facing holistic and equitable sustainability measures. Support for small- and medium-sized enterprises domestically as well as in low- and middle-income countries, especially in sub-Saharan Africa, is part of the US Department of Agriculture's (USDA) and US Agency for International Development's implementation of UNFSS commitments on behalf of the US government. Integrating this approach into domestic measures will increase consistency in food systems policies and strengthen the US economy. An important aspect of this is supporting women farmers and farmers of color. The USDA should consider increased investment in programs to assist presently and historically marginalized farmers and young farmers. Despite recent lawsuits, the USDA should view these programs as important steps toward redressing the department's history of discriminatory practices toward black farmers.

Pursuing a range of innovative technologies and policies, such as those that enable greater supply chain traceability, poses a challenge and an opportunity for fostering food system equity and sustainability. Improving the transparency of global and domestic supply chains can build greater accountability to UNFSS and COP26 commitments while opening market access to a wider range of producers. Traceability technology can be leveraged to help provide BIPOC farmers with expanded access to markets as well as digital payments to help ensure equitable compensation for their products. These technologies can work in concert with other market-based technologies to increase food access in low-income communities in the United States and around the world.

Despite the magnitude of challenges facing food systems, the United States has assets to tackle these issues. The land grant system of universities and their connections to cooperative extension will be invaluable for developing long-term climate change adaptation and mitigation strategies for US farmers. Continued investment in agricultural research and development will ensure cutting-edge innovations for a sustainable food future.

Conclusion

Meaningful, equitable change to achieve global climate change targets for mitigation and adaptation while eliminating hunger requires the involvement of more than just the US government. Civil society, NGOs, the donor community, academia, and the private sector all have key roles to play. A just transition to diverse food and fiber systems that protect and nourish the planet cannot happen in the absence of coordinated action across a broad societal spectrum. It is incumbent on all actors and hold each other accountable. To those ends, we offer the following recommendations[26] for civil society, the donor community, the private sector, academia, and the US government.

Recommendations for Individuals, Civil Society, and NGOs

1. **Grassroots and advocacy organizations should form rural and urban/rural regional coalitions to elevate the food systems agenda into climate change policy while building bridges between constituent groups.** Special attention should be given to providing leadership opportunities within coalitions to BIPOC farmers and community members; young people, especially high school and college students; and indigenous communities.

    a. These coalitions should recognize the necessity and power of context-based solutions, using local assets to address local challenges. This will provide a foundation for moving change forward at the federal level.

Recommendations for Donors

1. **The philanthropic community should recognize that prioritizing climate action in the food and agriculture sectors is an advantageous investment.** Special emphasis should be given to jumpstarting innovative technologies such as renewable energy, sensors, satellites, artificial intelligence, traceability for crop and livestock production, and supporting community grassroots climate change mitigation and adaptation.

2. **The donor community should partner with the finance sector to help NGOS adopt environmental, social, and governance metrics.** With increasing private sector adoption, such metrics could score sustainability performance and provide incentives for achieving climate-smart practice targets.

Recommendations for Government

1. **The USDA should assess how agricultural subsidies and crop insurance could be allocated to incentivize the adoption of climate-smart agricultural and agroecological practices.** This could entail expanding eligibility for commodity-based programs to include specialty crops, extending cover crop premium discounts, or reallocating some funds to incentivize implementation of climate-smart technologies or agroecological production methods.

2. **The USDA should collaborate with the Office of the Special Presidential Envoy for Climate to co-lead interagency cooperation, ensuring that federal efforts are aligned around common metrics, baselines, tools, and data collection practices for climate change mitigation and food systems**

adaptation. Common baselines and metrics will ease cooperation across agencies' initiatives, allowing for an efficient whole-of-government approach to climate change and food systems policies.

3. **Federal and state government institutions—such as schools, veterans' hospitals, and correctional facilities—should coordinate to adopt food purchasing policies that prioritize low-carbon, nutrient-rich local and regional sourcing.** Priority should be given to BIPOC producers, women producers, and other presently and historically marginalized groups, as well as producers using climate-smart practices.

    a. As a member of the School Meals Coalition, the United States should ensure that local purchasing policies are central in efforts to support school feeding programs in LMICs. This would boost local agricultural markets while increasing the amount of fresh, nutritious foods available to children, which is vital for their success and particularly important for increasing girls' enrollment in school.

Recommendations for the Private Sector

1. **Private sector asset managers and owners should ensure their COP 26 commitment to align capital investments with the goal of achieving net zero via innovative climate-smart agriculture adaptation as well as mitigation.** Simultaneously, investment should be made in emissions-reducing practices and technologies.

2. **The private sector should collaborate with governments to establish common baselines and performance metrics for climate-smart agriculture practices**. By agreeing on a standard set of baselines and metrics, producers will have more clarity on the benefits of conservation agriculture, and consumers will be able to better evaluate the impact of their food purchasing.

3. **To ensure a truly sustainable food system, corporations should commit to supporting full supply chain transformation, including appropriate transparency and monitoring at every stage of production.** This commitment will help corporations fulfill their UNFSS and COP26 promises while empowering consumers to make better-informed choices.

Recommendations for Academia

1. **Universities should invest in increased open platform data science, next-generation modeling, and biotech research to support the development of new digital and biotech tools.** Investing in open platform data science will make university research more accessible to US-based implementers, as well as researchers and policy makers in LMICs.

2. **Academia should prioritize closer collaboration with the government and private sector to ensure policy development is science- and data-based.** Increased collaboration should also occur among US universities and between US and LMIC-based higher education institutions to expand the base of

knowledge informing policy innovations and make cutting-edge research more accessible globally.

3. **Universities should invest in and prioritize transdisciplinary research for development of transformative solutions to climate change and nutrition challenges.** This should include research on social innovations like new forms of land ownership and management and democratic governance mechanisms, as well as technological innovations.

About the Authors

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[26] The Council will track these recommendations and report on progress made toward UNFSS commitments one year after the summit and in the years following.

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