



U.S. Department of Agriculture  
Natural Resources Conservation Service

NRCS-ADS-093

## NOTICE OF GRANT AND AGREEMENT AWARD

1. Award Identifying Number NR233A750004G061	2. Amendment Number	3. Award /Project Period Date of Final Signature - 06/30/2027	4. Type of award instrument: Grant Agreement
5. Agency (Name and Address) USDA Partnerships for Climate-Smart Commodities c/o FPAC-BC Grants and Agreements Division 1400 Independence Ave SW, Room 3236 Washington, DC 20250 Direct all correspondence to FPAC.BC.GAD@usda.gov		6. Recipient Organization (Name and Address) THE UNIVERSITY OF TEXAS RIO GRANDE VALLEY UNIVERSITY OF TEXAS RIO GRANDE VALL EY 1201 W. UNIVERSITY DR EDINBURG TX 78539-2909 UEI Number / DUNS Number: L3ATVUT2KNK7 / 069444511 EIN:	
7. NRCS Program Contact Name: Jade Nield	8. NRCS Administrative Contact Name: CHARLENE WINTERS	9. Recipient Program Contact Name: Rafael Almeida	10. Recipient Administrative Contact Name: Roxanna Garcia
(b)(6)			
11. CFDA 10.937	12. Authority 15 USC 714 et seq	13. Type of Action New Agreement	14. Program Director Name: Rafael Almeida <div style="background-color: yellow; width: 100px; height: 20px;">(b)(6)</div>
15. Project Title/ Description: Expands markets for climate-smart beef, lamb, goat meat, vegetables, and orchard crops in the TX Rio Grande Valley supporting farmers with implementation and monitoring of climate-smart practices.			
16. Entity Type: H = Public/State Controlled Institution of Higher Education			
17. Select Funding Type			
Select funding type:	<input checked="" type="checkbox"/> Federal	<input checked="" type="checkbox"/> Non-Federal	
Original funds total	\$2,229,177.00	\$18,897.00	
Additional funds total	\$0.00	\$0.00	
Grand total	\$2,229,177.00	\$18,897.00	
18. Approved Budget			

Personnel	\$819,840.42	Fringe Benefits	\$251,120.08
Travel	\$47,847.24	Equipment	\$102,611.00
Supplies	\$54,972.54	Contractual	\$17,100.72
Construction	\$0.00	Other	\$935,685.00
Total Direct Cost	\$1,953,904.00	Total Indirect Cost	\$275,273.00
		Total Non-Federal Funds	\$18,897.00
		Total Federal Funds Awarded	\$2,229,177.00
		Total Approved Budget	\$2,248,074.00

This agreement is subject to applicable USDA NRCS statutory provisions and Financial Assistance Regulations. In accepting this award or amendment and any payments made pursuant thereto, the undersigned represents that he or she is duly authorized to act on behalf of the awardee organization, agrees that the award is subject to the applicable provisions of this agreement (and all attachments), and agrees that acceptance of any payments constitutes an agreement by the payee that the amounts, if any, found by NRCS to have been overpaid, will be refunded or credited in full to NRCS.

Name and Title of Authorized Government Representative KATINA HANSON Acting Senior Advisor for Climate-Smart Commodities	Signature <b>KATINA HANSON</b> Digitally signed by KATINA HANSON Date: 2023.07.19 08:10:29 -05'00'	Date
Name and Title of Authorized Recipient Representative DR. THOMAS SPENCER Associate Vice President of Research Operations	Signature  DocuSigned by: 1FA75058D16B457...	Date 7/11/2023

**NONDISCRIMINATION STATEMENT**

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW., Washington, DC 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

**PRIVACY ACT STATEMENT**

The above statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. Section 522a).

## Statement of Work

### Purpose

The purpose of this agreement, between the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) and The University of Texas Rio Grande Valley, is to build markets for climate-smart commodities and invest in America's climate-smart producers to strengthen U.S. rural and agricultural communities.

### Objectives

The objectives of this project are to support the production and marketing of climate-smart commodities by providing voluntary incentives to producers and landowners, including early adopters, to implement climate-smart agricultural production practices, activities, and systems on working lands; measure/quantify, monitor and verify the carbon and greenhouse gas (GHG) benefits associated with those practices; and develop markets and promote the resulting climate-smart commodities.

### Budget Narrative

The official budget summarized below and described in the attached Budget Narrative will be considered the total budget as last approved by the Federal awarding agency for this award.

Amounts included in this budget narrative are estimates. Reimbursement or advance liquidations will be based on actual expenditures, not to exceed the amount obligated.

TOTAL BUDGET \$ 2,248,074.00

TOTAL FEDERAL FUNDS \$2,229,177

PERSONNEL \$650,667

FRINGE BENEFITS \$199,302

TRAVEL \$37,974

EQUIPMENT \$102,611

SUPPLIES \$43,629

CONTRACTUAL \$13,572

CONSTRUCTION \$0

OTHER \$906,149 (INCLUDES PRODUCER INCENTIVES \$387,271)

TOTAL DIRECT COSTS \$1,953,904

INDIRECT COSTS \$275,273

TOTAL NON-FEDERAL FUNDS \$18,897

PERSONNEL \$14,763

FRINGE BENEFITS \$4,134

TRAVEL \$0

EQUIPMENT \$0

SUPPLIES \$0

CONTRACTUAL \$0

CONSTRUCTION \$0

OTHER \$0 (INCLUDES PRODUCER INCENTIVES \$0)

TOTAL DIRECT COSTS \$18,897

INDIRECT COSTS \$0

Recipient has an approved Negotiated Indirect Cost Rate Agreement (NICRA) with a rate of 26 percent and a base of modified total direct costs, consisting of all direct salaries and wages, applicable fringe benefits, materials and supplies, services, travel and up to the first \$25,000 of each subaward (regardless of the period of performance of the subawards under the award) \$1,058,744.

When equipment is purchased with Federal funds it must be used until no longer needed as described in the General Terms and Conditions and 2 CFR 200. If the residual value of the equipment is \$5,000 or more at the time it is no longer needed, the recipient must request disposition instructions. The disposition instructions may direct the recipient to: 1) sell the equipment and return a proportionate share of the proceeds to the Federal agency; 2) transfer title to another eligible entity identified by the Federal agency; or 3) keep the equipment if desired and compensate the Federal agency for its proportionate share of the value.

**Responsibilities of the Parties:**

If inconsistencies arise between the language in this Statement of Work (SOW) and the General Terms and Conditions attached to the agreement, the language in this SOW takes precedence.

**RECIPIENT RESPONSIBILITIES**

Perform the work and produce the deliverables as outlined in this Statement of Work and attachments.

Ensure Paperwork Reduction Act (PRA) clearance is obtained prior to conducting data collection from producers or other project participants, including data collection performed by subrecipients.

Comply with the applicable version of the General Terms and Conditions.

Submit reports and payment requests to the ezFedGrants system as outlined in the applicable version of the General Terms and Conditions. Reporting frequency is as follows:

Performance Reports: Quarterly

SF425 Financial Reports: Quarterly

Detailed Progress Report: Quarterly

(The detailed progress report is in addition to the performance and financial reports referenced above and described in the general terms and conditions)

**Expected Accomplishments and Deliverables**

See attached Benchmarks Table and associated Project Narrative.

**Resources Required**

See the Responsibilities of the Parties section for required resources, if applicable.

**Milestones**

See attached Benchmarks Table and associated Project Narrative.

## **GENERAL TERMS AND CONDITIONS**

Please reference the below link(s) for the General Terms and Conditions pertaining to this award:

<https://www.fpacbc.usda.gov/about/grants-and-agreements/award-terms-and-conditions/index.html>

**Attachments:**

Budget Narrative

Project Narrative

Benchmarks Table

Climate-Smart Practices List and Limitations

Data Dictionary

Climate-Smart Specific Terms and Conditions

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## 1. EXECUTIVE SUMMARY

This proposed project—**Validating agrivoltaic technology with underserved agricultural producers**—has three key objectives: (1) pilot climate-smart, innovative co-location of agriculture and solar power (‘agrivoltaics’); (2) measure and evaluate greenhouse gas (GHG) benefits from these agrivoltaic systems; and (3) promote equitable climate-smart commodity (CSC) market development for Hispanic Farmers and Ranchers (HFR). As a project based at the University of Texas Rio Grande Valley, a premier Hispanic-Serving Institution and federally-designated Hispanic-Serving Agricultural College and University, the project will leverage the cultural wealth of the region with the diverse expertise of the project team. Activities will combine implementation, evaluation, market development, and outreach focused on agrivoltaics in a region with the highest concentration of Hispanic Farmers and Ranchers (HFR) in the country (USDA NASS 2017). The outcome of this project will include a roadmap for inclusive climate-smart agricultural practices, equitable market development for associated CSC, and improved long-term feasibility for farmers and ranchers across the country.

**Compelling need for the project:** The need for the project is based on the well-established and documented necessity to reduce GHG emissions in the agriculture sector to limit the ecological, economic, and social impacts of climate change. USDA has been addressing this through the promotion of climate-smart agricultural practices that mitigate GHG impacts. The co-location of solar power and agriculture in agrivoltaic systems is an innovative climate-smart practice that combines GHG benefits and land-use efficiency. Yet farm-scale trials incorporating robust GHG and market analyses are lacking, and outreach to minority farmers in particular is rare. Still, agrivoltaics are gaining wide acceptance and will soon count among the established climate-smart practices endorsed by USDA. This project will provide critical information and market-development support required for this progress. As such, agrivoltaics represent an enormous opportunity for all farmers—especially minority, low-resource, and underserved producers across the country—to improve the environmental and economic outcomes of their farm operations. The sunny Rio Grande Valley (RGV) in South Texas—a region with the highest concentration of HFR in the country and among the highest rates of poverty—is an ideal place to pilot agrivoltaics in order to bolster the long-term financial sustainability and environmental outcomes of underserved farm operations. The project team includes qualified specialists who will provide more than \$1.2M in direct financial and technical assistance to underserved producers in the RGV, as well as UTRGV faculty and staff who will conduct rigorous evaluation on the economic and environmental benefits of agrivoltaics and market development strategies to improve adoption by farmers across the region.

**Contact:** Project Director, Dr. Rafael Almeida, [rafael.almeida@utrgv.edu](mailto:rafael.almeida@utrgv.edu), (607) 262-6212

### **Minority-Serving Partners:**

- The University of Texas Rio Grande Valley (UTRGV)—The second largest Hispanic-Serving Institution in the nation and the lead applicant for this project.
- UTRGV Center for Sustainable Agriculture and Rural Advancement (SARA)—Recognized leader in successfully managing and implementing USDA-funded projects serving HFR in South Texas, the region with the highest number and concentration of HFR in the nation. SARA will host and administer the project.

- Justice and Mercy Energy Services (JustEnergy)—A minority-serving nonprofit specialized in empowering underserved communities by designing, installing, and maintaining solar energy systems.
- Zamora Ranch—HFR-owned and operated ranch in Hidalgo County that will host an agrivoltaic demonstration site, coordinate demonstration fields days, and provide targeted outreach and HFR recruitment support.
- Hub of Prosperity—an urban farm partnership between Edinburg First United Methodist Church and UTRGV Agroecology that will host an agrivoltaic demonstration site and coordinate demonstration fields days
- Starr County Industrial Foundation (SCIF)—Hispanic-led economic development body serving HFR in rural Starr County, home to the highest concentration of HFR in the nation (96%).
- Texas/Mexico Border Coalition (TMBC)—Hispanic-led community-based organization serving HFR and rural communities along the U.S.-Mexico Border.
- HOPE for Small Farm Sustainability—Hispanic-led community-based organization focused on small-farm sustainability in underserved communities throughout South Texas.

**Other Partners:**

- Purdue University—Land-grant university developing innovative approaches for climate-smart commodity market development.
- AgriSolar Clearinghouse—Agrivoltaics-focused center affiliated with the National Center for Appropriate Technology that provides outreach and technical assistance programs for farmers, solar companies, and other stakeholders interested in co-locating solar power and agriculture.
- RGV Solar—RGV-based solar company that owns a 37-acre agrivoltaic field in McAllen, Texas.

**Project Team:** The project will be led and implemented by a diverse, experienced, and complementary team of subject matter experts that will ensure this project meets its goals.

Evaluation Team (ET)

- Dr. Rafael Almeida, proposed Project Director, Assistant Professor of Energy Sustainability (UTRGV), is a biogeochemist and program manager with expertise in GHG emissions from managed ecosystems, renewable energy systems, and food systems.
- Dr. Alexis Racelis, Associate Professor of Agroecology (UTRGV), is an agroecologist specialized in sustainable agricultural management practices. Formerly a research ecologist with the USDA-ARS, Dr. Racelis is a 2018 USDA Kika de la Garza Fellow and a member of USDA’s Federal Equity Commission, Subcommittee on Agriculture.
- Dr. Engil Pereira, Assistant Professor of Soil Ecology (UTRGV), is an agronomist with expertise in GHG emissions and carbon sequestration of soils and agricultural fields and a 2022 USDA Kika de la Garza Science Fellow.

Outreach and Technical Assistance Team (OTA)

- Colin Cain, Executive Director, SARA will lead and oversee outreach and technical assistance activities, including supervision of two SARA staff members on the project. Mr. Cain has



served as PD/Co-PD on 15 USDA-funded technical assistance and outreach projects specifically serving HFR in South Texas and has strong relationships with HFR-led groups.

- Dr. Stacie Peterson, Energy Program Director, AgriSolar Clearinghouse, will lead a team of nine staff in supporting outreach and technical assistance activities, including development of targeted recruitment guides and best practices handbook, and semiannual recruitment and technical assistance workshops for HFR.
- Dr. Horacio Vasquez, Professor of Mechanical Engineering (UTRGV), will be responsible for designing adaptable and agriculture-friendly agrivoltaic mounting and pivot systems.
- Brian Thomas and Kayla Garrett, JustEnergy, will lead JustEnergy in managing agrivoltaic system leases, installation, maintenance, as well as technical assistance to HFR on their use.
- Rose Benavides, President, SCIF, will lead recruitment support for HFRs in Starr County.
- Susan Lopez, Manager, TMBC, will lead regional HFR recruitment and enrollment efforts focusing on 400-plus group members and extensive regional outreach network.
- Diana Padilla, President, HOPE for Small Farm Sustainability, will support HFR recruitment and enrollment via existing HOPE programs.

#### Market Development Team (MDT)

- Dr. Diego Cardoso, Assistant Professor of Agricultural Economics (Purdue University), will lead market development activities related to analyzing and developing CSC markets, as well as impacts of agrivoltaics on agricultural productivity, potential to generate economic co-benefits for farmers, and financial feasibility.
- Dr. Anna Erwin, Assistant Professor of Environmental Social Science (UTRGV), will lead market development activities including consumer and wholesale demand, willingness-to-pay for branded CSC, stakeholder perceptions of agrivoltaic implementation, and value generation to end consumers of climate-smart commodities.

**Approach to minimize transaction costs:** the project will reduce transaction costs associated with project activities through two primary strategies:

- (1) This project will be managed and implemented by a coalition of partners with extensive experience working with HFRs to promote adoption of climate-smart practices. The Outreach and Technical Assistance Teams have a close understanding of the needs and pain points of HFRs, and will structure outreach, technical assistance, and financial incentive transactions to be most convenient and least time-consuming for targeted HFR.
- (2) The project team also has extensive experience developing culturally and linguistically relevant outreach and technical assistance tools for HFR and will ensure that all producer-facing activities are delivered in a manner that is culturally resonant and easy to understand and adopt.

**Approach to reduce producer barriers to implementing practices:** This project will provide dedicated outreach, technical assistance, and financial incentives to HFR to overcome operational, economic, and cultural barriers to adoption of agrivoltaics in the RGV. The project is dedicating approximately 60% of its budget to engage HFR with hands-on culturally-relevant assistance that will serve to increase awareness and knowledge on the benefits of agrivoltaics, skills in implementing practices on their farm or ranch, and dedicated financial and technical support to

manage systems and maximize economic benefits and productivity for HFR operations. Additionally, the Market Development Team will evaluate producer and stakeholder perceptions regarding agrivoltaic adoption and identify obstacles

**Geographic focus:** This project's focus is the Rio Grande Valley (RGV), the southernmost tip of Texas near the U.S.-Mexico border. The region consists of four counties: Starr, Hidalgo, Willacy, and Cameron. The RGV is home to 5500 individual farm operations (USDA NASS 2017), and demographic and environmental factors make this sun-rich region particularly suitable for piloting a minority-focused agrivoltaics project. Almost one-fifth of all Hispanic producers in the U.S. are in South Texas (18.4%), and the RGV is the hub of sustainable agriculture in the state. Hidalgo County has the highest number of organic-certified farms in Texas. Further, Hidalgo County has the highest number and Starr County has the highest concentration of HFR in the country. A substantial proportion of these farm operations are small-scale—80% of RGV producers generate less than \$10,000 in annual agricultural sales (USDA NASS 2017). Providing technical and financial support to diversify income via innovative climate-smart agrivoltaics can bring positive economic and social impacts to this underserved agricultural region.

**Project management capacity of partners, including experience working with HFR promoting climate-smart activities:** The University of Texas Rio Grande Valley (UTRGV) is the second largest Hispanic-Serving Institution in the U.S. and is a critical service provider for HFRs in South Texas. More than 93% of UTRGV's 30,000 students are Hispanic, and it offers both bachelor's and master's degrees in sustainable agriculture. Over the past 20 years, UTRGV and its legacy institutions have developed and operated 57 USDA-funded projects that provide outreach, training, and technical assistance to farmers and ranchers, totaling \$12.7 million. The project will be managed under UTRGV's Center for Sustainable Agriculture and Rural Advancement (SARA), which is committed to serving HFRs in rural communities throughout South Texas. SARA currently manages six USDA-funded projects that promote climate-smart agricultural practices to HFRs, with a focus on racial equity and justice in conservation agricultural practices. These activities have served over 600 HFRs in the last two years alone. SARA staff will administer the project, coordinate major project activities, and support delivery of the project's outreach and technical assistance plan. Other project partners, including AgriSolar, JustEnergy, TMBC, Purdue University, and HOPE have extensive experience working with underserved groups promoting climate-smart activities.

Objectives & Core Activities	Y1	Y2	Y3	Y4	Responsible Teams
<b>1. Pilot and scale agrivoltaics (AV) among Hispanic Farmers and Ranchers (HFRs)</b>					
1.1 Deploy AV demonstration sites					OTA
1.2 Outreach: Recruit and enroll Hispanic Farmers and Ranchers (HFR)					OTA
1.3 Provide technical and financial assistance to enrolled HFR					OTA
<b>2. Evaluate GHG benefits of AV</b>					
2.1 Measure/quantify GHGs in demonstration sites					ET
2.2 Measure/quantify GHGs in enrolled HFR sites					ET
2.3 Monitor AV practice implementation					ET, OTA
2.4 Report and verify GHG benefits					ET
2.5 Participate in Partnerships Network					ET
<b>3. Promote AV market development and expansion for HFR</b>					
3.1 Assess willingness to pay for AV commodities					MDT
3.2 Analyze financial feasibility and economic benefits for HFR adopters of AV					MDT
3.3 Evaluate stakeholder perception					MDT

**Project plan and timeline:** The goal of this project is to increase adoption of climate-smart agricultural practices and expand markets for associated climate-smart commodities among HFR in the RGV. This goal is supported by three key objectives and 11 aligned activities (shown in the workplan above) that will ensure that the project scales the innovative use of agrivoltaics, provides tangible benefits for enrolled HFRs, and develops monitoring, reporting, and verification activities at minority-serving institutions.



## 2. PLAN TO PILOT CLIMATE-SMART AGRICULTURE

### 2.1. Description of the Climate-Smart Practice to be Deployed

Ensuring access to low-impact renewable energy and promoting sustainable agriculture are two pivotal Sustainable Development Goals. Yet land-use conflicts may emerge in the pursuit of these goals. Some mid-century decarbonization scenarios for the U.S. project deployment of land-based solar panels over an area as large as the state of West Virginia (Princeton Net-Zero America Project, 2021). Thus, land use for area-intensive solar farms may increase competition with agricultural food production.

One nascent solution to limit land-use conflicts—while also achieving food security and decarbonization goals—is the co-location of agriculture and solar photovoltaic infrastructure. Known as ‘agrivoltaics’, these hybrid systems involve the dual use of land, with livestock grazing or crops growing underneath solar panels (Figure 1). The partial shade provided by the solar infrastructure has a range of advantages. When deployed in hot, water-stressed climates, co-benefits include a reduced need for irrigation due to shading-related increases in soil moisture, increased crop yields, and improved photovoltaic generation due to increased system performance

driven by cooler daytime temperatures (*Barron-Gafford et al. 2019: "Agrivoltaics provide mutual benefits across the food–energy–water nexus in drylands", Nature Sustainability*).

The shade offered by solar panels creates a microclimate in which air and soil temperatures decrease, leading to a series of soil biogeochemical changes (e.g., increased soil moisture) that directly control soil carbon and GHG dynamics. The greater level of soil moisture and the consequent high water-use efficiency under solar panels can promote vegetation growth, which in turn will increase carbon input into the soil. Conversely, increased soil moisture can promote microbial activity, increasing nitrous oxide (N<sub>2</sub>O) fluxes from both nitrification and denitrification processes. Direct effects of agrivoltaic systems on GHG sources and sinks remains under-quantified. This project will help the USDA fill this gap by quantifying direct effects of agrivoltaic practices on GHGs.

Agrivoltaic systems are gaining traction worldwide. Currently, global capacity of agrivoltaics is ~3 GW, and a report by Fitch Solutions Country Risk & Industry Research projects more than 10 GW of additional system capacity to come online by 2030. There is tremendous potential for the agrivoltaic market in the U.S.: today, only 2% of total U.S. electricity comes from solar power (~80 GWh per year), but decarbonization scenarios point to as much as 30% of solar contribution by 2050 (~1600 GWh per year) (International Renewable Energy Agency, Global Renewables Outlook: Energy Transformation 2050).

Using land more profitably via dual-revenue streams like agrivoltaics can potentially throw a lifeline to prevent farmers from going out of business. The number of farms in the U.S. is declining steadily, with nearly 100,000 farms shutting down nationwide over the past decade (USDA NASS). Notably, small-scale producers have been facing significant financial hurdles, with consequences for rural communities and local food systems. Building economic resilience for small-scale farmers is essential in the face of increasing trade wars, industry consolidation, and accelerating climate change that enhance environmental and market risk and hurt farm productivity. Indeed, farmers already need ways to adapt to these changes. As observed with wind turbine adoption in agricultural regions across the U.S. and in the RGV, agrivoltaics represent a critical opportunity for farmers to diversify revenue streams as financial returns from farming becomes more variable.

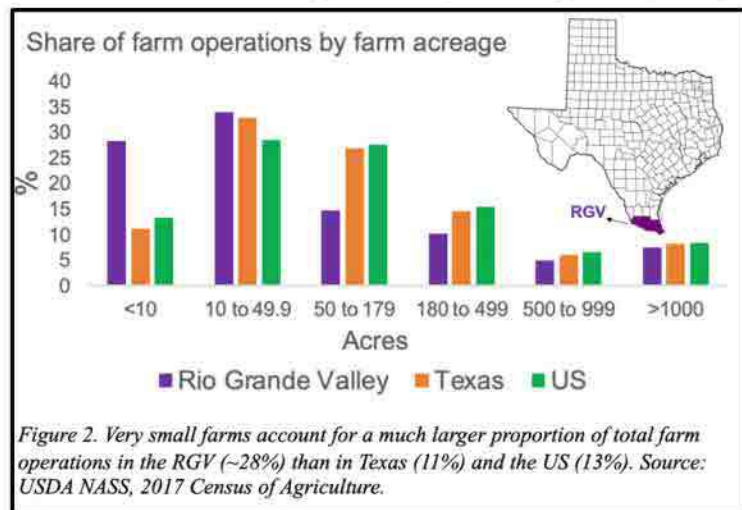
This project will scale agrivoltaics with underserved producers in South Texas and will address two major needs in the process. The project will create robust CSC market opportunities and novel revenue streams for high-need underserved producers while generating essential data on the GHG benefits and water-use efficiency of agrivoltaic systems. The conservation practice standard to be followed will be NRCS-374-CPS-1 Energy Efficient Agricultural Operation, which focuses on on-farm facilities, equipment, and management strategies that provide increased energy efficiency. Implementation will be followed closely by our technical assistance team, which includes experts like professor of engineering Dr. Horacio Vasquez and JustEnergy. Further, since agrivoltaics does not have a specific NRCS standard practice, it is our goal that our project data can be used to support such consolidation. The AgriSolar Clearinghouse is at the forefront of development of best practices and standards for agrivoltaic practices, and this partner will be responsible for producing outreach materials and best practice booklets that will be part of our project's outreach and technical assistance package.

**The Rio Grande Valley of Texas.** We propose to implement this project in the four-county Rio Grande Valley (RGV), the southernmost tip of Texas near the U.S.-Mexico border. This region is frequently ranked among the poorest in the nation and agriculture is a major pillar of the regional economy. The RGV is home to 5500 individual farm operations as of 2017 (USDA NASS). This project aims to place the RGV at the forefront of agrivoltaic development, thus promoting a climate-smart practice while providing novel means for income diversification in an economically disadvantaged region.

Demographic and environmental factors make the RGV particularly suitable for piloting an agrivoltaics project. One-third of Hispanic producers in the U.S. are in Texas. Within Texas, the majority of Hispanic producers are in the RGV. In Starr County, for example, 96% of farms are Hispanic-operated. A large proportion of these farm operations are very small: one-third of total farm operations in the RGV are 10 fewer acres, whereas such farms account for only about one-tenth of total farm operations in both Texas and the U.S. (Figure 2). In 2017, 80% of RGV producers generated less than \$10,000 in annual agricultural sales—against 60% for the U.S. as a whole. Providing technical and financial incentives to expand access to potentially profitable technologies such as agrivoltaics can cause positive social impact in historically underserved regions like the RGV.

Reasons to focus on the RGV extend beyond social impact. One major benefit of agrivoltaics is increased water-use efficiency in dry climates. Indeed, the RGV faces strong water stress and ongoing drought pressure. Irrigation is critical for RGV producers, particularly so for specialty crop growers—which are more likely to be Hispanic. According to the 2017 Census of Agriculture, about 35% of farm operations in the RGV are irrigated, against 7% in Texas and 15% in the U.S. Improving water-use efficiency of farming practices through agrivoltaics could reduce pressure on water resources in the water-stressed RGV.

**Target commodities.** The project team has chosen to focus primarily on two agricultural commodities: specialty crops and livestock (beef cows, sheep and/or goats). Specialty crops predominate among small-scale HFRs in the RGV. As of 2017, the RGV had more than 350 farm operations with specialty crops including vegetables and orchard crops of 2017 (USDA NASS 2017). Cattle ranching is another crucial agricultural practice in the RGV, with 3014 individual farm operations as of 2017. In South Texas, cattle ranching is historically linked to HFRs. For example, there are 961 properties with reported cattle inventories in Starr County alone—where 96% of producers are Hispanic (USDA NASS 2017).



## 2.2. Recruitment and Enrollment of Hispanic Farmers and Ranchers

The project will follow a robust recruitment plan, coordinated with Hispanic-led community partners, that will drive recruitment and enrollment of HFR to adopt agrivoltaic systems. Project outreach will be led by the UTRGV Center for Sustainable Agriculture and Rural Advancement (SARA), in close coordination with community partners including: Zamora Ranch, Hub of Prosperity, Texas/Mexico Border Coalition, SCIF, and HOPE. The project outreach plan contains four sequential elements—with each activity building increasingly-targeted audiences for the next—that will address critical barriers to agrivoltaic adoption and drive HFR enrollment, including:

- (1) In-person and remote HFR recruitment via events hosted by community partners to increase awareness of the benefits of agrivoltaic systems
- (2) In-person field days and workshops to better understand agrivoltaic system use and on-farm application
- (3) One-on-one follow-up consultations with project outreach and technical assistance staff to discuss on-farm application of agrivoltaics for individual HFR operations
- (4) One-on-one HFR enrollment and implementation of agrivoltaic systems

Key resources that will maximize the impact of outreach and recruitment activities include:

- Agrivoltaic demonstration sites: the project will deploy a farm-level demonstration sites to showcase and evaluate the GHG benefits and yield performance of agrivoltaic practices in the RGV. Our demonstration site will be the Oxford Solar Field in McAllen, Texas, which is owned by project partner RGV Solar LLC. This demonstration site will host annual demonstration field days where project staff will showcase the use and benefits of the agrivoltaic systems and register HFR for in-person on-farm follow-ups from members of the Outreach and Technical Assistance Team. In addition to enhancing recruitment potential, pilot data from demonstration sites will inform outreach and technical assistance to ensure that enrolled producers maximize the GHG and financial benefits of their agrivoltaic operations.
- Trusted Outreach and Recruitment Partners: project community-based partners including TMBC, SCIF, and HOPE—all of which have strong ties to HFR communities—will provide culturally relevant promotional and recruitment messages and materials to HFR.
- Texas Hispanic Farmer and Rancher Conference: UTRGV SARA has been hosting the Texas Hispanic Farmer and Rancher Conference since 2018, which can help the project engage 400 HFR per year.
- BFRDP & 2501 Project Events: UTRGV SARA manages two large-scale multi-year projects that serve HFR in South Texas, proving consistent access to large HFR audiences (See letter of support from SARA Director, Colin Cain).

Broad-based promotion and marketing will include a mix of traditional and digital media, including the creation of advertisements (physical flyers, videos, interactive digital flyers optimized for mobile devices) that will be posted at key hubs for HFRs, as well as distributed via digital channels (email, social media, and website) by primary project partners. Translation of project outreach materials into regionally-appropriate Spanish will be initially performed by bilingual project staff, and then vetted by the UTRGV Translation and Interpretation Office—free

of cost to the project—to ensure all materials communicate in a linguistically and culturally appropriate manner. Estimated impacts of recruitment and enrollment include:

- Number of small-scale HFR with increased knowledge of benefits of agrivoltaics: 600
- Number of small-scale HFR enrolled: 12
- Total value of HFR financial and technical assistance: \$1,281,530

### **2.3. Technical Assistance, Outreach, and Training to Hispanic Farmers and Ranchers**

This project’s technical assistance plan includes essential HFR outreach, training, and one-on-one consultations. This robust service package will allow enrolled HFRs to understand how to incorporate climate-smart agrivoltaic practices into their farms and ranches and troubleshoot agricultural production and agrivoltaic system issues. The technical assistance plan (including in-person and remote workshops, and on-farm and remote one-on-one consultations) will be coordinated by Co-PD Alexis Racelis and Co-PD Colin Cain, and will include the following key partners:

- UTRGV SARA Staff—led by Co-PD Colin Cain, SARA staff will provide direct technical assistance to individual HFR, developing needs assessments and identifying implementation challenges across all enrollees. The UTRGV Project Coordinator and Agricultural Specialist will be the primary points of contact with HFR enrollees, and will conduct bi-monthly technical assistance consultations to identify technical assistance delivery needs and coordinate the team’s response. Mr. Cain has more than 20 years of experience developing and implementing projects that serve the needs of HFRs and manages a staff of 10 that provide technical assistance on climate-smart practices.
- JustEnergy—will provide the primary technical assistance on the operation, maintenance, and repair of the agrivoltaic systems, led by Kayla Garrett and Brian Thomas. Ms. Garret (PhD. Environmental Science) and Mr. Thomas (MSEE) co-founded JustEnergy to serve the renewable energy needs of underserved communities, and both have worked on federally-funded projects providing agrivoltaic and renewable energy solutions to underserved communities.
- AgriSolar Clearinghouse—will provide training and specialized technical assistance to HFR on best practices for integrating specialty crop production and ranching practices with the agrivoltaic system. AgriSolar will commit more than 2300 hours to the project, and will provide one in-person workshop for HFR enrollees per project year where they will review best practices, common challenges, financing options, and long-term planning agrivoltaic production. Dr. Stacie Peterson, director of the AgriSolar program, is a nationally-renowned expert on agrivoltaics with more than 14 years providing technical assistance on sustainable energy projects for farmers and ranchers.

All technical assistance materials, tools, and trainings will be delivered in English and Spanish. Translations will be initially performed by bilingual project staff, and then vetted by the UTRGV Translation and Interpretation Office—free of cost to the project—to ensure all materials communicate in a linguistically and culturally appropriate manner.

The project team will provide technical assistance to farmers to ensure adequate implementation of agrivoltaic practices, in addition to scheduled monthly visits. Further, the AgriSolar Clearinghouse team will annually visit the sites for independent verification of implemented practices, as detailed in the MMRV plan below.

#### **2.4. Plan to Provide Financial Assistance for Hispanic Farmers and Ranchers**

To advance equity, this project will provide \$387,271 (17.4% of total project cost) in direct financial assistance for HFR to implement agrivoltaic systems on their farms and ranches. This financial assistance will fully cover costs with installation, operation and maintenance of agrivoltaic systems for 12 participating producers during project duration, up to a maximum system size of 7.7 kW (24 panels, ~0.025 acres). Financial assistance will be provided via buy down of four-year lease costs for a full 7.7-kW photovoltaic system. UTRGV will connect enrolled HFR with partner JustEnergy and will facilitate and fully subsidize the lease of the agrivoltaic system, including installation and ongoing maintenance. The per-system financial incentive is \$36,836.31 in project year one and is projected to rise each year based on an estimated 5% increase in equipment costs. Farmers will not have any debt associated with the incentivized adoption of agrivoltaics at the end of the project.

Based on the National Renewable Energy Laboratory's PVWatts Calculator, a 7.7-kW photovoltaic system is estimated to annually produce 11,860 kWh in the RGV. Annual solar sales to the grid would total \$1,200, assuming a wholesale/sell-back rate of \$0.10/kWh. This potential new revenue is substantial in the context of RGV producers: 57% of RGV farm operations have annual sales below \$2,500 (USDA NASS 2017). This project will target these small-scale producers, providing opportunities for income diversification and unprecedented farm-level GHG and market development of a nascent climate-smart practice.

Agrivoltaics are a new climate-smart tool and USDA does not currently provide economic benefits for this conservation practice, therefore enrolled participants cannot have received or receive payments or benefits for adoption of this practice. The project will use annual self-certifications for participants to ensure that they are not receiving payment or benefits for use of this practice by USDA.

### **3. MEASUREMENT, MONITORING, REPORTING AND VERIFICATION (MMRV) PLAN**

The MMRV plan will be led by (1) Dr. Engil Pereira, a soil ecologist at UTRGV, (2) Dr. Rafael Almeida, a biogeochemist and energy sustainability scientist at UTRGV, and (3) Dr. Alexis Racelis, an agroecologist at UTRGV. Pereira and Almeida are experts in carbon and nitrogen cycling, with particular focus on emissions of CO<sub>2</sub>, methane (CH<sub>4</sub>) and N<sub>2</sub>O from natural and managed ecosystems, whereas Racelis is an expert in climate-smart agricultural management practices. Pereira, Almeida and Racelis will work closely with the project staff and the AgriSolar Clearinghouse, which will be responsible for third-party verification.

#### **3.1.Measurement**

The GHG quantification plan will focus on (1) modeling of GHG emission reductions linked to fossil-fuel savings and (2) direct physical measurements in the field. The combination of models to compute GHGs reduced by solar power deployment and a robust set of field measurements to



assess soil GHG flux and carbon sequestration will allow our team to reliably estimate the overall GHG benefits of agrivoltaics.

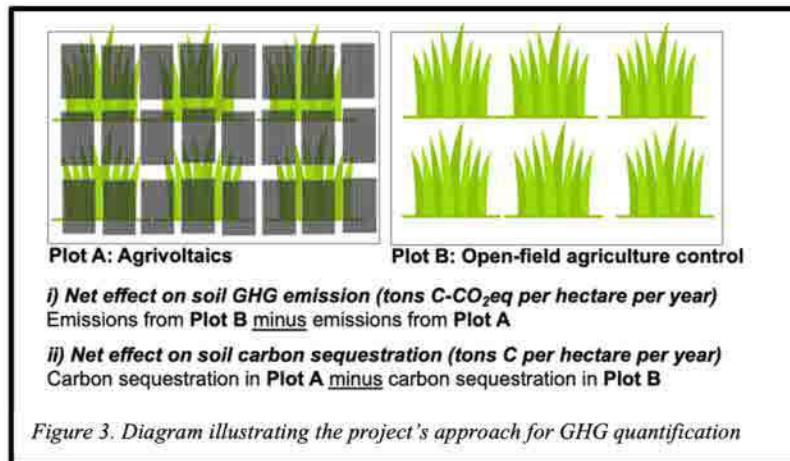
To model GHG emission reductions linked to fossil-fuel savings, we will use COMET-Energy, which is one of the models indicated for alternate calculation of GHG benefits in the USDA Partnerships for Climate Smart Commodities

Data Submission Guide & Dictionary for Grantees. We are projecting the installation of 123 kW of photovoltaic capacity, which has an estimated solar energy generation of 189,00 kWh in the RGV (PVWatts Calculator, NREL). According to COMET-Energy, 105 tons CO<sub>2</sub>-eq per year are reduced by avoiding 189,000 kWh of fossil-fuel generation. Assuming a 25-year lifespan for the solar panels, these modeled GHG benefits equal 2625 tons. For reference, 2625 tons of CO<sub>2</sub>-eq have a total (undiscounted) value of \$134,000, considering a social cost of carbon of \$51/ton.

Field measurements will support the quantification of direct GHG benefits as (i) net effects on soil GHG emissions and (ii) net effects on carbon sequestration, considering the set of measurements that will be made in unshaded production systems (control) and shaded agrivoltaic systems (Figure 3). Adopted GHG methods will be consistent with chapter 3 (“*Quantifying GHG sources and sinks in cropland and grazing land systems*”) of the USDA Technical Bulletin 1939 of 2014, as well as with related scientific literature.

The MMRV Team will quantify GHG emissions, plant biomass, soil organic carbon and ancillary parameters in all HFR sites enrolled during the project. For GHG emissions, chamber-based fluxes of CO<sub>2</sub>, N<sub>2</sub>O and CH<sub>4</sub> will be made using state-of-the-art portable gas analyzers (Li-Cor LI-7820 for N<sub>2</sub>O and Li-Cor LI-7810 for CH<sub>4</sub> and CO<sub>2</sub>) coupled to a LI-8200 Smart Chamber. Chamber-based methods are widely established for measuring soil gas fluxes (for example, see *J.A. Subke et al. 2020, Springer Handbook of Atmospheric Measurements*). Chambers will be installed in shaded zones (i.e., under the solar panels, “Plot A” in Figure 3) and in zones without shade (i.e., surface exposed to sunlight; “Plot B” in Figure 3). The team will work with producers to obtain seasonal crop yield, livestock yield, and pasture productivity to estimate yield-scaled emissions (i.e., GHG emissions divided by agricultural yield).

Soil cores will be taken once a year for quantification of total carbon concentration and bulk density. Soil cores will be collected at three depths (0 – 20 cm, 20 – 40 cm, and 40 – 60 cm) in triplicates in field zones with (agrivoltaic plot) and without shade (control plot). Composite samples will be air dried, sieved (2 mm), and ground before quantification of total carbon by total combustion.



Finally, volumetric soil moisture and soil temperature will be measured with capacitance-domain probes (e.g., EC5 by Meter Group) installed at the immediate vicinity of the gas sampling chambers and logged every 60 minutes using data loggers (e.g., ZL6 logger by Meter Group). The proposed GHG measurement plan will allow the project team to explore and develop procedures to cost-effectively estimate GHG benefits from direct relationships between GHG emission and sequestration data and ancillary environmental parameters.

### 3.2. Monitoring

The project will rely on three main monitoring methods: on-farm visits, plot-based sampling, and soil sensors.

The enrolled HFR sites will be visited monthly, whereas the Oxford demonstration site will be visited biweekly. Project staff will use these on-farm visits to verify producer alignment with the best practices introduced by the outreach team. Direct field measurements of GHGs will be made during these monthly/biweekly on-farm visits. In the biweekly sites, sampling frequency will be intensified to seven consecutive days following certain field and climatic events, providing a full snapshot of flux responses to dynamic meteorological and hydrologic conditions (e.g., increased soil moisture). The frequent sampling approach will capture the extent and magnitude of GHG flux changes until the fluxes subside to background levels, providing a robust estimation of overall GHG budgets. In addition to frequent on-farm visits and direct sampling of GHGs, a network of soil sensors to measure moisture and temperature at 60-minute intervals will be implemented at all sites.

Below, we provide a summary of the on-farm GHG measurement and monitoring methodology.

#### *Task: Measurement and monitoring of soil GHG flux:*

- Gas samples will be collected using smart soil flux chambers.
- Sampling will occur monthly for 12 HFR sites and bi-weekly for 1 demonstration site.
- At each monthly HFR site (n=12), we will install 6 chambers for gas sampling (3 in the traditional agriculture control area and 3 in the agrivoltaic treatment area). Given the project's producer enrollment schedule (starting in first quarter of year 2), this will translate into:
  - Year 1: 0 gas samples
  - Year 2: 6 samples \* 12 times \* 6 sites = 432 gas samples
  - Year 3: 6 samples \* 12 times \* 12 sites = 864 gas samples
  - Year 4: 6 samples \* 12 times \* 12 sites = 864 gas samples
- At the biweekly demonstration site (n=1), we will install 18 chambers for gas sampling (9 in the traditional agriculture control area and 9 in the agrivoltaic treatment area). Given the project schedule (demonstration site starting in third quarter of year 1), this will translate into:
  - Year 1: 18 samples \* 12 times \* 1 sites = 216 gas samples

- Year 2: 18 samples \* 24 times \* 1 sites = 432 gas samples
- Year 3: 18 samples \* 24 times \* 1 sites = 432 gas samples
- Year 4: 18 samples \* 24 times \* 1 sites = 432 gas samples

*Task: Measurement and monitoring of soil carbon and soil bulk density:*

- At each monthly HFR site (n=12), we estimate collecting 6 soil samples per year for soil carbon and bulk density analyses. Given the project's producer enrollment schedule, this will translate into:
  - Year 1: 0 samples
  - Year 2: 6 sites x 6 samples = 36 soil samples
  - Year 3: 12 sites x 6 samples = 72 soil samples
  - Year 4: 12 sites x 6 samples = 72 soil samples.
- At the biweekly demonstration site (n=1), we estimate collecting 18 soil samples per year for soil carbon and bulk density. Given the project schedule (demonstration site starting in third quarter of year 1), this will translate into:
  - Year 1: 1 site x 18 samples = 18 soil samples
  - Year 2: 1 sites x 18 samples = 18 soil samples
  - Year 3: 1 site x 18 samples = 18 soil samples
  - Year 4: 1 site x 18 samples = 18 soil samples.

*Task: Measurement and monitoring of soil moisture:*

- We will install sensors to estimate soil moisture content. Each sensor will estimate and record soil moisture every 60 minutes resulting in 24 data-points per day and 8,760 data points per year.
- At each monthly HFR site (n=12), we will install 6 moisture sensors and one solar-powered data-logger, resulting in 58 sensors.
  - 12 sites x 6 sensors + 20% replacement due to wear and tear = 86 sensors.
- At the biweekly demonstration site (n=1), we will install 18 moisture sensors and one solar-powered data-logger.
  - 1 sites x 18 sensors + 20% replacement due to wear and tear = 22 sensors.

### **3.3. Reporting**

The reporting framework will consist of documenting and sharing measurement and monitoring results with project partners, NRCS and our third-party verification partner via e-mail and reports. In addition, project results will be presented at the Annual Solar Farm Summit, a newly launched agrivoltaics expo that is scheduled to take place annually.

Under the supervision of Pereira, Racelis and Almeida, the Agricultural Specialist will analyze and interpret the GHG data collected following the GHG measurement and monitoring steps. Internal reports will be produced to inform the outreach team and the third-party actor (AgriSolar Clearinghouse). Results of this project will be featured in the best-practice booklet to be prepared by our partner NCAT AgriSolar Clearinghouse, and technical and scientific outputs of this project will be deposited permanently in NCAT's online library.

The project team will also quarterly report results to NRCS following the Partnerships for Climate-Smart Commodities Data Submission Guide. Field-modeled GHG benefit reports (i.e., results from COMET-Energy) and field direct measurement results will be submitted as a separate report, following USDA's directions for supplemental data submission on page 13 of the abovementioned data submission guide.

In addition, the project director or the project coordinator will participate in and report results to the USDA Partnerships for Climate-Smart Commodities Learning Network. Project results have the potential to support the addition of agrivoltaics as a standard conservation practice by NRCS.

### **3.4. Verification**

To provide independent confirmation that implementation of agrivoltaics as well as measurement, monitoring and reporting information are complete, accurate and reliable, this project will rely on annual third-party site visits and reports. The third-party verifier will be the AgriSolar Clearinghouse. Through annual site visits, a climate-smart agriculture specialist from the AgriSolar Clearinghouse will ensure that the agrivoltaic systems are aligned with the best practices defined by the project team. In addition, the AgriSolar Clearinghouse team will produce annual reports verifying the accuracy and reliability of practice implementation and GHG measurement, monitoring and reporting activities.

## **4. PLAN TO DEVELOP AND EXPAND CSC MARKETS**

The marketing plan for climate-smart commodities produced through the project will assist participating agricultural producers in developing and expanding markets in two broad commodity categories: climate-smart livestock and climate-smart crops. Given the limited scale of the project and its budget, as well as the scale and resources of the underserved agricultural producers targeted by this project, this project will focus its market development/expansion activities on three primary marketing channels: direct-to-consumer (within Texas), aggregated local sales (within South Texas/Rio Grande Valley), and retail/wholesale (within Texas). This plan will follow three primary objectives to develop and expand markets for climate-smart commodities: CSC Pricing Strategy, CSC Product Branding, and CSC Customer Engagement/Education.

A summary of the project's market development activities is provided in the following paragraphs, and detailed information is provided in the following sections.

- Partnerships have been developed between UTRGV and the following groups to execute and implement the marketing plan:
  - Purdue University—Land-Grant University in Indiana, through the participation of Agricultural Economist Diego Soares Cardoso, has partnered with UTRGV to lead the market development team

- RGV Solar LLC—local agrivoltaic company that is partnering with UTRGV to provide support to the market development team in executing branding and customer engagement activities, through the participation of experienced South Texas ranchers, energy investors and food system entrepreneurs James McAllen Jr. and Melissa Guerra.
- Given the limited budget and scale of this project and focus on the development of local markets for direct-to-consumer sales, no specific supply-chain tracking is planned or budgeted.
- Estimated economic benefits for participating producers include \$32,288 via in-kind direct incentives for deployment of agrivoltaic systems. Estimating potential market returns on premium pricing for climate smart commodities is challenging at this stage, though the project will use average premiums for organic equivalents as the benchmark. According to USDA ERS in 2016, the premium was >20% for the majority of organic foods, with Axios reporting that the average premium had dropped to 14.7% as of April 2022.
- Post project potential is significant. Agrivoltaics are a new tool and the practice of co-locating agricultural production and solar energy will likely develop significantly during this project. Scaling project activities is possible, with an increase of funding, and adding focus on larger-acreage producers. The long-term viability of the project is strong, given the economic incentives of the agrivoltaic practice itself, though the market development for climate smart commodities will determine the pricing premium producers can expect.

#### **4.1. Partnerships Designed to Market Climate-Smart Commodities**

UTRGV will partner with Purdue University and RGV Solar LLC to conduct market development and CSC promotion activities. This partnership will assist prospective agrivoltaic adopters and inform strategic development of the agrivoltaic industry in the RGV and other underserved regions. The Market Development Team will target economic and sociocultural components of both the supply and demand sides of CSC markets, led by Dr. Diego Cardoso, economist in Purdue University's Department of Agricultural Economics, and Dr. Anna Erwin, environmental social scientist in UTRGV SEEMS. Through this partnership, the project will (1) develop critical new data on potential demand and willingness-to-pay for labeled CSC products by consumers and wholesale buyers, (2) develop a thorough analysis of the direct and indirect financial benefits and overall feasibility of agrivoltaics for HFR adopters, and (3) evaluate barriers to widespread agrivoltaic implementation by measuring and quantifying HFR and stakeholder perceptions of economic incentives and possible GHG, economic, and social benefits.

The Market Development Team will also generate and summarize data that is critical to support farmers, private firms, and governmental agencies in amplifying the adoption of agrivoltaics—data that currently does not exist and which market participants have constraints or little incentive to produce. In conjunction with the GHG evaluation, these market development and CSC promotion activities will generate new data that can guide the consolidation of agrivoltaics as a climate-smart practice as well as the development of markets for and promotion of agrivoltaic CSC

(e.g., labeling mechanisms). The components of the market development approach are described in the following sections.

#### **4.2. Plan to Develop Markets for and Promote CSC (Demand-Side)**

Numerous studies have demonstrated that consumers are willing to pay more for sustainable food products, with an average premium of about 25% in North America (e.g., *Li & Zein 2021, "Meta-analysis of consumers' willingness to pay for sustainable food products", Appetite*). Agrivoltaic CSC offer the possibility of new labeling that informs end consumers about its sustainable production practices and potentially increases demand for such commodities, measured through willingness-to-pay surveys with end consumers and institutional buyers in the RGV and throughout Texas. Beyond willingness to pay, the production of agrivoltaic commodities might affect consumer perceptions about the product and producers. However, existing studies of willingness to pay and perception changes of sustainable products do not consider agrivoltaics nor reflect the socioeconomic reality of underserved communities in the RGV. To assess attitudes toward these commodities, the Market Development Team will conduct in-person, internet, and telephone surveys with Texas consumers that will gauge willingness to pay for CSC food products produced in agrivoltaic properties and evaluate possible changes in perceptions in light of labeling. This exploratory analysis will include investigating relationships between the presence of climate-smart labeling and consumer perceptions and willingness to pay for such agricultural products.

Given that the project will focus on only a few CSC product types (specialty crops and livestock), and that most HFRs to be served by the project will be small-scale and more likely to sell directly to consumers or retailers, the project will limit its approach to tracking GHG benefits through the supply chain. This is in keeping with the project's focus on equitably serving underserved producers and to developing GHG monitoring and reporting at a minority serving institution (UTRGV).

#### **4.3. Economic Benefits and Barriers for Participating HFR Producers (Supply-Side)**

The Market Development Team's approach for estimating economic benefits for participating HFRs will include assessments of (i) the impact of agrivoltaics on land productivity, (ii) their potential to generate co-benefits for farmers and the environment, (ii) the financial feasibility of investments in agrivoltaics, and (iv) the social and cultural dimensions of agrivoltaic adoption among HFRs.

**Impacts on land productivity.** Quantifying complementarities between crops and electricity generation is a critical step in assessing the feasibility of agrivoltaic systems and supporting farmer decisions in adopting these systems. The prevailing method to quantify complementarities of land input in intercropping practices is the Land Equivalent Ratio: the area required to produce two or more products separately divided by the area to produce the same amount of each good when intercropped. This is a flexible method that can be extended to accommodate combinations of crops and electricity production. Therefore, to assess the complementarity potential of agrivoltaics, the Market Development Team will estimate Land Equivalent Ratios for solar energy production alongside crop types and livestock commonly produced in the RGV. This estimation will use the field data collected at our demonstration and enrolled HFR sites.

**Co-benefit generation.** In addition to the direct effects on yields, agrivoltaic systems should

generate financial co-benefits for HFR producers. Three key co-benefits are revenues (or savings) from generated electricity, savings from improved water-use efficiency, and sales of credits from additional carbon sequestration. Furthermore, lower water use and carbon capture can also generate external co-benefits in excess to farmers' private co-benefits.

*Electricity generation.* Electricity production will contribute to the financial sustainability of agricultural producers: revenue from electricity sales act as a financial buffer and insurance, offering a stable, secondary stream of income. These revenues will benefit HFR in underserved regions with limited access to affordable financial-management instruments—which is the case for HFR in the RGV. For instance, estimates for an average generation of 11,860 kWh/year from the agrivoltaic systems proposed for HFR enrollees has an annual value of \$1186, assuming an average wholesale/sell-back rate of \$0.10/kWh; for context, nearly 60% of RGV farm operations have annual sales below \$2,500 (USDA NASS 2017). Understanding the differences across operating sizes is crucial to identifying the most advantageous settings for the financial sustainability of small-scale underserved farmers. Hence, the Market Development Team will estimate cost-saving and revenue-generating potential for a range of operation scales compatible with the distribution of farm sizes in the RGV. This estimation will leverage technical data and field expertise from JustEnergy, a technical-assistance partner in this project.

*Water-use efficiency.* In water-stressed regions like the RGV, agrivoltaics-related improvements in water-use efficiency should lead to cost savings, especially in irrigated crops, and higher yields. Moreover, water conservation is critical for the RGV given the history of drought. Therefore, the Market Development Team will quantify the potential economic value of higher water efficiency via higher yields and lower water use with agrivoltaic systems. This calculation will rely on water use and agricultural yield data from field experiments, estimates of irrigation technical costs, and water cost estimates based on shadow price methods. The project will assess whether estimated water savings from agrivoltaic systems can generate external benefits due to improved water conservation at the regional scale.

*Carbon credits.* Microclimatic changes under agrivoltaic systems should promote additional carbon sequestration—a mechanism that will be verified by the GHG Evaluation Team. A confirmation of this mechanism could place agrivoltaics alongside no-till and cover crops as USDA-sanctioned practices that increase carbon sequestration. As such, this mechanism will create carbon-credit ownership opportunities for HFR. Hence, the Market Development Team will evaluate the revenue-generating potential in carbon credit markets with the additional, direct GHG benefits of agrivoltaic systems. This evaluation will use results from field experiments, reference carbon prices and credit trade values, and typical overhead costs for farmers to market generated credits. In addition, the analysis will calculate the total economic value (i.e., private value to farmers plus external value) of emission reductions from agrivoltaic systems using reference estimates of the social cost of carbon.

**Financial feasibility.** Analyses of Land Equivalent Ratios and co-benefits will quantify the economic benefits of agrivoltaic systems once they have been installed. However, a comprehensive assessment of the feasibility of agrivoltaic projects must account for installation, operating, and maintenance costs of such systems. Since agrivoltaic systems may partially displace other agricultural outputs, opportunity costs will be measured. Finally, as revenues and costs are unevenly distributed over time, calculating the return on the investment requires a dynamic

perspective. Combining these elements, the Market Development Team will calculate the overall financial return of agrivoltaic systems for different farm sizes and under various economic and environmental scenarios. Emphasis will be on specialty crop types and livestock common in the RGV that show favorable Land Equivalent Ratios. This calculation will use yield data from field experiments, technical cost estimates from JustEnergy, and economic and agricultural data from public sources, such as USDA's Baseline Projections.

**Stakeholder perceptions of agrivoltaic implementation.** The project aims to diversify income streams for HFR in the RGV through the installation of agrivoltaic systems. Despite potentially positive impacts, negative perceptions can thwart implementation of renewable energy technologies, including agrivoltaics. Thus, the Market Development Team will investigate how project stakeholders (farmer adopters, solar companies, local policymakers, and project staff) perceive agrivoltaic systems (aesthetics, maintenance, impacts on crops, economic potential), and the project's current economic incentive structure as well as alternative funding mechanisms. This analysis will inform the outreach and technical assistance plan and efforts to promote widespread agrivoltaic development in underserved farming communities.

*Perceptions of economic, ecological, and social impacts of agrivoltaics.* There is still little understanding of how people perceive agrivoltaics and potential HFR barriers to adoption. Multiple factors, including context and demographics, can shape how and if producers adopt sustainable technologies. Therefore, documenting how local communities perceive and experience agrivoltaics is necessary to inform future USDA actions and design context-specific approaches to support and uphold adoption. The Market Development Team will document how stakeholders perceive the economic, ecological, and social possibilities of agrivoltaics to evaluate project success and make necessary changes as the project matures.

*Analyzing stakeholder perceptions of incentive structure.* Stakeholder opinions of the incentive structure that accompanies agrivoltaic installation will also be evaluated. While positive economic gains can incentivize adoption, other factors, including cultural and social norms, environmental concerns, local context, and public opinion also influence how and if producers adopt renewable energy technologies. Moreover, economic-incentive preferences can vary by farm size and demographics. The Market Development Team will evaluate how participating stakeholders perceive the effectiveness of the incentive structure and investigate constraints to adoption at a larger scale. Results will provide insight into best practices for supporting adoption of agrivoltaics, through economic incentives and other means.

These two components will be analyzed by conducting 20-25 semi-structured interviews with the farmers that participate in the program, representatives from participating food organizations and solar companies, local policymakers, and project staff that explore these themes and identify demographics of participants. Purposive and snowball sampling will be used to identify and recruit interviewees. Responses will be triangulated by evaluating how different stakeholders view both the current program and efforts to expand the implementation of agrivoltaics throughout the RGV. The qualitative data analysis software Nvivo 12 will be used to conduct content and thematic analysis. Participating researchers will complete the UTRGV Institutional Review Board (IRB) training for ethics in social science, and all data collection and analysis procedures will be approved by the UTRGV IRB.



#### **4.4. Post-Project Potential**

Post-project potential is strong, and based on three critical factors:

- (1) Ability to scale agrivoltaics across the U.S., and particularly with HFR in other regions, is significant. Agrivoltaic agricultural practices are relatively new, but producers and industry associations across the U.S. have been quick to adopt and promote them widely. According to the National Renewable Energy Laboratory, the global capacity of agrivoltaics has grown rapidly from about 5 MW in 2012 to approximately 2,900 MW in 2020. Large systems can be costly, but the innovative approach piloted by this project will pave the way for new financing and co-development strategies where solar investors can provide up-front capital expenditures in the long-term and affordable leasing plans can be negotiated.
- (2) Long-term viability of the project's promotion of agrivoltaics and market development of related climate-smart commodities is strong. The project will work hard to establish long-term relationships between HFR and HFR-serving community-based organizations with private-sector agrivoltaic system vendors and service providers, helping each to gain a real-world understanding of the challenges and opportunities of agrivoltaic systems during the project period, and laying the groundwork for long-term commercial partnerships. The project will also broker similar connections between HFR and retail and wholesale buyers, through the work of the Market Development and Technical Assistance teams, providing an on-ramp for HFR who want to sell branded CSC products.
- (3) Informing USDA actions to encourage future climate-smart commodities and agrivoltaic adoption will be accomplished through the work of the Project Director, in coordination with the project's Evaluation and Market Development Teams. Dr. Almeida will participate in regular USDA CSC Partnerships Network meetings and share updates on HFR agrivoltaic adoption, resulting GHG benefits, and the development of markets for CSC products. He will also provide regular reporting to USDA and project stakeholders on activities and outcomes. Collectively, this communication and reporting strategy will inform future USDA decisions, particularly in regard to incorporating agrivoltaics among the USDA-sanctioned climate-smart practices and resulting agricultural products branded as CSC. The novel analysis of direct GHG emissions and carbon sequestration in agrivoltaic systems will also inform future development of the USDA COMET-Planner.

BENCHMARKS/MILESTONES	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
<b>Quantitative quarters by quarter (cumulative)</b>																
Number of producers involved	0	0	0	0	2	4	5	6	8	10	11	12	12	12	12	12
Number of underserved producers involved	0	0	0	0	2	4	5	6	8	10	11	12	12	12	12	12
Number of acres involved	0	0	0	0.1	0.125	0.15	0.175	0.2	0.225	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Number of head involved (if applicable)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dollars provided to producers	0	0	\$0	\$0	\$64,545	\$129,090	\$161,363	\$193,636	\$256,181	\$322,726	\$354,998	\$387,271	\$387,271	\$387,271	\$387,271	\$387,271
GHG Benefits (Metric Tons of CO2e Reduced or Sequestered)	0	0	0	0	13.16	26.32	32.9	39.48	52.64	65.8	72.38	78.96	78.96	78.96	78.96	78.96
Number of new marketing channels* established	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
Number of marketing channels* expanded	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
Number of GHG measurement tools utilized	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2
<b>Other benchmarks (quantitative and qualitative)</b>																
<i>Outreach, training and other technical assistance</i>																
Outreach activities for producer recruitment	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Training and technical assistance to enrolled producers	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Other MWRV and supply chain traceability attributes</i>																
GHG measurement and monitoring activities	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
On-site visit from third-party verification partner	No	No	Yes	No	No	No	Yes	No	No	No	Yes	No	No	No	Yes	No
Reporting of modeled and field-measured GHG benefits	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Other measurements of work related to marketing of commodities</i>																
Customer engagement and education activities	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Development of climate smart product branding and pricing strategy	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			
<i>Demonstrated engagement of major partners</i>																
AgrSolar Clearinghouse: production of outreach materials and best practice booklet	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
AgrSolar Clearinghouse: In-person workshops to promote benefits of agrivoltaics	No	Yes	No	No	No	Yes	No	No	No	Yes	No	No	No	Yes	No	No
AgrSolar Clearinghouse: Training sessions with enrolled producers	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
JustEnergy: technical assistance with PV system procurement, design, installation and operation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
RGV Solar LLC: implementation of demonstration site	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No
RGV Solar LLC: support to marketing plan			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Purdue University: analysis of estimated economic benefits of agrivoltaics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No
<i>Climate smart technologies employed (if applicable)</i>																
Number of producer sites with agrivoltaic installations	0	0	0	0	2	4	5	6	8	10	11	12	12	12	12	12
<b>Others</b>																
Hiring of project coordinator	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Hiring of climate-smart agriculture specialist	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
<i>Multipliers</i>																
	0.025	Acres of 7.7kW system														
	12	Total number of producers involved														
	\$387,271	Total \$ provided to producers														
	6.58	tons CO2eq reduced per 7.7kW system														

**Climate-Smart Practices and Limitations**

Climate-Smart practices under this grant shall be limited to the following practices:

<b>NRCS Practice Code (if applicable)</b>	<b>Practice Name</b>
374	Energy Efficient Agricultural Operation

All practices applied under this grant will follow NRCS practice standards unless noted below:

N/A



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Commodities  
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## Overview of Reporting Requirements

Grant recipients are required to submit reports to document their performance under the *Partnerships for Climate-Smart Commodity* funding opportunity. These submissions will be required to use the Microsoft Excel workbook templates provided by USDA. The workbooks contain a series of worksheets that collect data in a standardized format to ensure data quality and allow for aggregation and summary of this information. The entire workbook must be submitted quarterly, with updates to all applicable worksheets. This guide is divided into three sections. The *Overview of Reporting Requirements* section summarizes the layout of the reporting workbook and presents the data elements included in each worksheet. It also describes additional documents that must be submitted to supplement the performance reports. The *Data Definitions* section provides descriptions and allowable response options for each data element. The guide also indicates whether each data element is required, applicable at times, or optional; as well as how frequently each data element must be updated. Finally, the *Appendices* contain practice and commodity lists that will be used for these reports. Reporting is necessary for USDA oversight of this effort. The data elements required for inclusion in the quarterly performance reports allow USDA to conduct selected audits to review whether producers are receiving federal funds from multiple sources for the same purpose; to determine whether GHG benefits from implementation of climate-smart agriculture and forestry (CSAF) practices are being estimated accurately; and for other purposes deemed appropriate by USDA.

The reporting worksheets collect information at four levels: project, partner, producer, and field. Descriptions of each level:

- Project level:** Information about activities and impacts at a whole project/aggregate level (i.e., reflecting all activities under the grant agreement). Some project-level reporting is further subdivided by commodity type or a combination of commodity and CSAF practice(s) (commodity x practice).
- Partner level:** Information about activities related to a single organization (recipient, subrecipient, contractor, or other partner) within a project.
- Producer level:** Information about individual producers who have one or more farms enrolled in a project.
- Field level:** Information about individual fields enrolled in a project.

Certain data elements are required to be reported for each producer and field enrolled in a project. In order to minimize the burden associated with data collection and to enable USDA to match data to existing records, these producer- and field-specific records must use the producer's established FSA Farm, Tract and Field IDs, and report the State and County associated with the Farm ID. Associated data entered in conjunction with these data elements, such as Producer Name, must match the data contained in the customer's Business Partner record, and the Farm Operating Plan in Business File for that Farm ID. Disclosure of this information is protected under Section 1619 of the Food, Conservation, and Energy Act of 2008 (PL 110- 246), 7 U.S.C. 8791. Additionally, Departmental Regulation 4370-001 provides USDA's policies for collecting demographic data, including race, ethnicity and gender. Providing demographic information is voluntary and at the discretion of the customer. Demographic information is used by USDA for statistical purposes only and will not be used to determine an applicant's eligibility for programs or services for which they apply.

**Note:** For purposes of this guide, "farm" refers to the operation from which climate-smart commodities are produced and may represent farms, ranches, forests or other operations. Similarly, "field" refers to the individual land units at which climate-smart practices are being implemented to produce climate-smart commodities and may represent lots, farmsteads or other units, depending on the type of operation and commodity. The use of "Farm", "Tract" and "Field" align with the FSA definitions; for example, "A field is a part of a farm that is separated from the balance of the farm by a permanent boundary, such as; fences, permanent waterways, woodlands, croplines in cases where farming practices make it probable that this cropline is not subject to change, and other similar features."


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The following tables list the data elements included in each reporting worksheet, along with a brief description of each item.

### Project Summary

These data will be collected about each project. Cumulative results are reported each quarter. Report last quarter's entry if there has been no change in this quarter.

Table 1. Project Summary elements

<b>Data element name</b>	<b>Description</b>	<b>Frequency</b>
Commodity type	Type of commodity(ies) incentivized by the project	Quarterly
Commodity sales	Indicates sales of the commodity(ies) related to the project occurred this quarter	Quarterly
Farms enrolled	Indicates enrollment activities occurred this quarter	Quarterly
GHG calculation methods	Methods used to calculate greenhouse gas (GHG) benefits	Quarterly
GHG cumulative calculation	Method used to calculate cumulative GHG benefits	Quarterly
Cumulative GHG benefits	Whole project estimate of total GHG (CO <sub>2</sub> e) emission reductions	Quarterly
Cumulative carbon stock	Whole project estimate of total carbon sequestration	Quarterly
Cumulative CO <sub>2</sub> benefit	Whole project estimate of total CO <sub>2</sub> emission reductions	Quarterly
Cumulative CH <sub>4</sub> benefit	Whole project estimate of total CH <sub>4</sub> emission reductions	Quarterly
Cumulative N <sub>2</sub> O benefit	Whole project estimate of total N <sub>2</sub> O emission reductions	Quarterly
Offsets produced	Amount of carbon offsets produced by project	Quarterly
Offsets sale	Name of marketplace where carbon offsets were sold	Quarterly
Offsets price	Price of carbon in offset sales	Quarterly
Insets produced	Amount of carbon insets produced by project	Quarterly
Cost of on-farm TA	Cost of on-farm technical assistance (TA) provided to producers	Quarterly
MMRV cost	Cost of measurement, monitoring, reporting, and verification (MMRV) activities	Quarterly
GHG monitoring method	Methods used by project to monitor GHG benefits (up to 5)	Quarterly
GHG reporting method	Methods used by project to report on GHG benefits (up to 5)	Quarterly
GHG verification method	Methods used to verify GHG benefits (up to 5)	Quarterly



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Partner Activities

These data will be collected at the project level. Each row in this worksheet will represent one organization involved in the project, including the recipient and all contributing partners. A partner is any organization that is receiving project funds or providing matching contributions (funds or in-kind contributions) to the project. While the recipient must complete one row for their own organization, not all data elements apply to the recipient. These exceptions are noted in the detailed descriptions of the specific elements in the *Data Definitions* section of this guide. Data are reported cumulatively each quarter. Report last quarter's entry if there has been no change in this quarter.

Table 2. Partner Activities elements

<b>Data element name</b>	<b>Description</b>	<b>Frequency</b>
Partner ID	Unique ID for each partner	One-time
Partner name	Name of partner organization	One-time
Partner type	Type of organization	One-time
Partner POC	Partner point of contact name	As applicable
Partner POC email	Partner point of contact email	As applicable
Partnership start date	Start of partnership on project	One-time
Partnership end date	End of partnership on project	As applicable
New partnership	Indicator for partner organizations that have no prior work with the recipient	As applicable
Partner total requested	Total amount requested to date by partner from recipient	Quarterly
Total match contribution	Total amount of match contribution by partner to date	Quarterly
Total match incentives	Total amount of match contribution by partner for incentives	Quarterly
Match type	Top 3 types of match contribution by partner, other than incentives	Quarterly
Match amount	Value of match contributions by type	Quarterly
Training provided	Top 3 types of training provided to the partner through project	Quarterly
Activity by partner	Top 3 types of activities provided by this partner to producers or other partners	Quarterly
Activity cost	Approximate cost per activity type provided by partner to producers or other partners	Quarterly
Products supplied	Names of products supplied to producers as part of project activities or incentives	Quarterly
Product source	Supplier or source of products supplied to producers as part of project activities or incentives	Quarterly




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**Marketing Activities**

These data will be collected at the project level. Each row in this worksheet will correspond to one commodity for which the project enrolls fields and one marketing channel used to sell that commodity by the project or producers enrolled in the project. Data are reported for the current quarter and are not cumulative. If no sales of the commodity were reported during a quarter, do not complete this worksheet for that quarter.

Table 3. Marketing Activities elements

<b>Data element name</b>	<b>Description</b>	<b>Frequency</b>
Commodity type	Type of commodity incentivized by the project	Quarterly
Marketing channel type	Type of marketing channels used	Quarterly
Number of buyers	Number of buyers per marketing channel	Quarterly
Names of buyers	Names of buyers in the marketing channel	Quarterly
Marketing channel geography	Geography of marketing channel	Quarterly
Value sold	Value of commodity sold by marketing channel	Quarterly
Volume sold	Volume of commodity sold by marketing channel	Quarterly
Price premium	Price premium of commodity by marketing channel	Quarterly
Price premium to producer	Percent of price premium that goes to the producer	Quarterly
Product differentiation method	Top 3 types of product differentiation methods used	Quarterly
Marketing method	Top 3 types of marketing methods used	Quarterly
Marketing channel identification method	Top 3 ways marketing channel was identified	Quarterly
Traceability method	Top 3 types of supply chain traceability methods used	Quarterly


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### Producer Enrollment

These data will be collected at the producer level about each farm enrolled in the project. In this worksheet, each row will correspond to one farm that has at least one field enrolled in the project. Data are reported when a producer first enrolls one or more fields in the project. If a producer is enrolled in the project for multiple years, review the farm characteristics each time a new contract is signed and provide any necessary updates. The quarterly submission should contain information about each farm initially enrolled in the project during that quarter and for updates to farms that have re-enrolled during that quarter, as applicable. If no farms are enrolled during that quarter, do not complete this worksheet for that quarter.

Table 4. Producer Enrollment elements

<b>Data element name</b>	<b>Description</b>	<b>Frequency</b>
Farm ID	Unique Farm ID assigned by FSA	
State or territory	State name (must match FSA farm enrollment data)	
County of residence	County name (must match FSA farm enrollment data)	
Producer data change	Indicator that producer data was updated at re-enrollment	As applicable
Producer start date	Contract start date	Enrollment
Producer name	Name of primary operator	Enrollment
Underserved status	Indicator the primary operator is considered underserved and/or a small producer	Enrollment
Total area	Total area of enrolled operation	Annual
Total crop area	Total crop area in enrolled operation enrolled	Annual
Total livestock area	Total livestock confinement, pasture and rangeland in enrolled operation	Annual
Total forest area	Total forest area in enrolled operation	Annual
Livestock type	Top 3 types of livestock on enrolled operation	Annual
Livestock head	Total livestock currently managed (by type)	Annual
Organic farm	Indicator that part of the farm is certified or transitioning organic	Annual
Organic fields	Indicator that any of the enrolled fields are certified or transitioning organic	Annual
Producer motivation	Motivation for participation	Annual
Producer outreach	Top 3 types of outreach provided to producer	Annual
CSAF experience	Indicator of prior implementation of CSAF practices at this farm	Annual
CSAF federal funds	Indicator of prior receipt of federal funds for CSAF practices	Annual
CSAF state or local funds	Indicator of prior receipt of state funds for CSAF practices	Annual
CSAF nonprofit funds	Indicator of prior receipt of nonprofit funds for CSAF practices	Annual
CSAF market incentives	Indicator of prior receipt of market incentives for CSAF practices	Annual


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Field Enrollment

These data will be collected about each field enrolled in the project. In this worksheet, each row corresponds to one field x commodity combination enrolled in the project. Generally, data are reported once for each field, at its initial enrollment. The quarterly submission should contain information about each field initially enrolled in the project during that quarter. If no fields are enrolled during that quarter, do not complete this worksheet for that quarter. If a field is enrolled for multiple years, any relevant changes, such as a new ID number or changes to the commodity or practice combinations should be entered in this worksheet during the quarter it is re-enrolled, or as applicable.

Table 5. Field Enrollment elements

<b>Data element name</b>	<b>Description</b>
Farm ID	Unique Farm ID assigned by FSA
Tract ID	Unique Tract ID assigned by FSA
Field ID	Unique Field ID assigned by FSA
State or territory of field	State name
Physical County of field	Physical county name must match FSA farm records
Prior Field ID	Previous Field ID when reconstitution of farm results in new Field IDs
Field data change	Indicator that field data has changed from initial enrollment
Contract start date	Start date of contract
Total field area	Size of enrolled field
Commodity category	Category of commodity(ies) produced
Commodity type	Type of commodity(ies) produced
Baseline yield	Average yield of commodity in 3 years prior to enrollment
Baseline yield location	Location for which baseline yield is provided
Field land use	Most common land use in field in past 3 years
Field irrigated	Most common irrigation type in field in past 3 years
Field tillage	Most common tillage in field in past 3 years
Practice past extent - farm	Extent of operation that implemented this practice prior to project enrollment
Field any CSAF practice	Indicator for prior CSAF practices in this field in past 3 years
Practice past use - this field	Indicator of prior use of this practice in this field in the past 3 years
Practice type	CSAF practice(s) that will be implemented in enrolled field (up to 7)
Practice standard	Organization that developed CSAF practice standard implemented in field
Planned practice implementation year	Year that practice is planned to be implemented
Practice extent	Area or number of animals for which practice is implemented
Follow-on questions	Follow-on questions by practice type (see Table 11)



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Farm Summary

These data will be collected about each farm enrolled in the project. In this worksheet, each row will correspond to one farm that has at least one field enrolled in the project. The quarterly submission should contain updates to any data elements that have changed for each farm enrolled in the project during that quarter. If there are no changes from the previous quarter, do not complete this worksheet for that quarter. Data are not cumulative.

Table 6. Farm Summary elements


<b>Data element name</b>	<b>Description</b>	<b>Frequency</b>
Farm ID	Unique Farm ID assigned by FSA	
State or territory	State name	
County of residence	County name	
Producer TA received	Type of technical assistance provided to producer	Quarterly
Producer incentive amount	Total financial incentive provided to the producer	Quarterly
Incentive reason	Top 4 reason(s) for financial incentives provided to producer	Quarterly
Incentive structure	Top 4 units on which financial incentives are structured	Quarterly
Incentive type	Top 4 type(s) of financial incentives provided to producer	Quarterly
Payment on enrollment	Extent of payment provided to producer upon enrollment	Quarterly
Payment on implementation	Extent of payment provided to producer upon implementation of CSAF practices	Quarterly
Payment on harvest	Extent of payment provided to producer upon harvest or slaughter	Quarterly
Payment on MMRV	Extent of payment provided to producer upon reporting or verification	Quarterly
Payment on sale	Extent of payment provided to producer upon sale of commodity	Quarterly


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Field Summary

These data will be collected about each field enrolled in the project for a commodity x practice(s) combination. In this worksheet, each row will correspond to one field x commodity x practice(s) combination enrolled in the project. Data for each field will be reported quarterly and are not cumulative. Report data for any elements that have an update in that quarter. Greenhouse gas benefit estimates must be entered upon practice completion or annually, as appropriate. If there are no changes from the previous quarter, do not complete this worksheet for that quarter. This worksheet includes a section to report the “official” estimate of GHG benefits – amounts of greenhouse gas emissions reduced and carbon sequestered – for the field. These quantities refer to the estimates that are used to calculate the project’s aggregate impact (reported in Table 1). Tables 8 and 9 are used to report alternate estimates of the field-level GHG benefits when additional methods are used to model (Table 8) or measure (Table 9) these impacts. Any field that can use COMET-Planner must submit those results, either as the official or alternate model.

Table 7. Field Summary elements

<b>Data element name</b>	<b>Description</b>	<b>Frequency</b>
Farm ID	Unique Farm ID assigned by FSA	
Tract ID	Unique Tract ID assigned by FSA	
Field ID	Unique Field ID assigned by FSA	
State or territory of field	State name	
County of field	County name	
Commodity type	Type of commodity produced from field	Quarterly
Practice type	Type of practice(s) incentivized in field (up to seven)	Quarterly
Date practice complete	Date that practice implementation is certified complete	Quarterly
Contract end date	End date of contract	Quarterly
MMRV assistance provided	Indicator that MMRV assistance is provided to field	Quarterly
Marketing assistance provided	Indicator that marketing assistance provided for commodity from field	Quarterly
Incentive per acre or head	Indicator that a per acre/head incentives is provided for the CSAF practice(s) on this field	Quarterly
Field commodity value	Value of commodity produced from field	Quarterly
Field commodity volume	Volume of commodity produced from field	Quarterly
Cost of implementation	Total cost of practice implementation in field	Quarterly
Cost coverage	Percent of total cost of implementation of practice covered by project incentives	Quarterly
Field GHG monitoring	Methods used to monitor GHG benefits in field (up to 3)	Quarterly
Field GHG reporting	Methods used to report on GHG benefits for field (up to 3)	Quarterly
Field GHG verification	Methods used to verify GHG benefits for field (up to 3)	Quarterly
Field GHG calculations	Methods used to calculate GHG benefits for field	Quarterly
Field official GHG calculation	Method used to calculate official GHG benefits for field	Quarterly
Field official GHG ER	Official estimate of total GHG emission reductions for field	Quarterly
Field official carbon stock	Official estimate of total carbon sequestration for field	Quarterly
Field official CO2 ER	Official estimate of total CO2 emission reductions for field	Quarterly
Field official CH4 ER	Official estimate of total CH4 emission reductions for field	Quarterly
Field official N2O ER	Official estimate of total N2O emission reductions for field	Quarterly
Field offsets produced	Amount of carbon offsets produced in field	Quarterly
Field insets produced	Amount of carbon insets produced in field	Quarterly
Other field measurements	Indicator that field data was collected for reasons other than GHG benefit estimation	Quarterly



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### GHG Benefits - Alternate Modeled

If greenhouse gas benefits are modeled for the same field using multiple methods, the results for the alternate models are reported in this worksheet. The “alternate” models refer to those model results that were not used in the calculation of the project’s aggregate impact (as reported in Table 1). Any field that can use COMET-Planner must submit those results, either as the official or alternate model. These data will be collected about the modeled GHG benefits for each field x commodity x practice(s) combination. In this worksheet, each row will correspond to one field enrolled in the project. Data are not cumulative. Each quarterly submission should include information for all fields that have new modeled data. Greenhouse gas benefit estimates must be entered upon practice completion or annually, as appropriate.

Table 8. GHG Benefits – Alternate Modeled elements


<b>Data element name</b>	<b>Description</b>	<b>Frequency</b>
Farm ID	Unique Farm ID assigned by FSA	
Tract ID	Unique Tract ID assigned by FSA	
Field ID	Unique Field ID assigned by FSA	
State or territory of field	State name	
County of field	County name	
Commodity type	Type of commodity(ies) produced from the field (up to 6)	Annual
Practice type	Type of practice(s) incentivized in field (up to 7)	Annual
GHG model	Model used to calculate GHG benefits	Annual
Model start date	Start date of model run	Annual
Model end date	End date of model run	Annual
Total GHG benefits estimated	Estimate of total GHG benefits for field	Annual
Total carbon stock estimated	Estimate of total change in carbon stock for field	Annual
Total CO2 estimated	Estimate of total CO2 emission reductions for field	Annual
Total CH4 estimated	Estimate of total CH4 emission reductions for field	Annual
Total N2O estimated	Estimate of total N2O emission reductions for field	Annual


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GHG Benefits - Measured

Projects must report the results of any carbon stock or greenhouse gas emission measurements in this worksheet. These data will be collected at the field level. Each row will represent a separate measurement method used to calculate GHG benefits for a given field. Data are reported once per year of measurement and are not cumulative. Each quarterly submission should include information for any field for which there are new soil samples or new calculations of annual GHG benefits based on actual measurements.

Table 9. GHG Benefits - Measured data elements

<b>Data element name</b>	<b>Description</b>	<b>Frequency</b>
Farm ID	Unique Farm ID assigned by FSA	
Tract ID	Unique Tract ID assigned by FSA	
Field ID	Unique Field ID assigned by FSA	
State	State name	
County	County name	
GHG measurement method	Method of measurement	Annual
Lab name	Entity that conducted analysis	Annual
Measurement start date	Start date of measurements	Annual
Measurement end date	End date of measurements	Annual
Total CO2 reduction calculated	Calculation of total CO2 reduction	Annual
Total carbon stock change calculated	Calculation of change in carbon stock	Annual
Total CH4 reduction calculated	Calculation of total CH4 reduction	Annual
Total N2O reduction calculated	Calculation of total N2O reduction	Annual
Soil sample result	Numeric result from soil sample	Annual
Measurement type	Type of analysis conducted	Annual


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### Additional Environmental Benefits

Projects that track additional environmental benefits (e.g., water quality improvements) from enrolled fields report results in this worksheet. These data will be collected about each field. Each row in this worksheet will correspond to an enrolled field. Data are not cumulative. Estimates of environmental benefits must be entered upon practice completion or annually, as appropriate.

Table 10. Additional Environmental Benefits elements

<b>Data element name</b>	<b>Description</b>	<b>Frequency</b>
Farm ID	Unique Farm ID assigned by FSA	
Tract ID	Unique Tract ID assigned by FSA	
Field ID	Unique Field ID assigned by FSA	
State	State name	
County	County name	
Environmental benefits	Indicator that project tracks other environmental benefits	Annual
Reduction in nitrogen loss	Indicator that project tracks reductions in nitrogen loss	Annual
Amount	Amount	Annual
Purpose	Purpose of tracking those co-benefits	Annual
Reduction in phosphorus loss	Indicator that project tracks reductions in phosphorus loss	Annual
Amount	Amount	Annual
Purpose	Purpose of tracking those co-benefits	Annual
Other water quality	Indicator that project tracks other water quality improvements	Annual
Type	Type of water quality metric being tracked	Annual
Amount	Amount	Annual
Purpose	Purpose of tracking those co-benefits	Annual
Water quantity	Indicator that project tracks reduced water use	Annual
Amount	Amount	Annual
Purpose	Purpose of tracking those co-benefits	Annual
Reduced erosion	Indicator that project tracks reductions in soil erosion	Annual
Amount	Amount	Annual
Purpose	Purpose of tracking those co-benefits	Annual
Reduced energy use	Indicator that project tracks reductions in energy use	Annual
Amount	Amount	Annual
Purpose	Purpose of tracking those co-benefits	Annual
Avoided land conversion	Indicator that project tracks reductions in land conversion	Annual
Amount	Amount	Annual
Purpose	Purpose of tracking those co-benefits	Annual
Improved wildlife habitat	Indicator that project tracks improvements in wildlife habitat	Annual
Amount	Amount	Annual
Purpose	Purpose of tracking those co-benefits	Annual



### Supplemental Data Submission

#### Project MMRV Plan

##### *Definition of MMRV elements:*

**Measurement:** Quantification of the greenhouse gas benefits (reduction or capture) using mathematical models and/or direct physical measurements in the field

**Monitoring:** Ongoing review and confirmation that the climate-smart practice has been implemented according to the agreed upon standard and documentation of any changes in the site, implementation, or GHG emissions impacts over time

**Reporting:** Documenting and sharing monitoring and measurement results with project partners, the recipient, and any third-party verification organization

**Verification:** Independent confirmation that measurement, monitoring and reporting information are complete, accurate and reliable.

Projects must submit an MMRV plan that includes details about how each of the following are addressed:

- Quantification approach, including:
  - GHG models used
  - GHG measurement plan (if applicable)
  - Approach to quantifying additional environmental benefits, if applicable (e.g., water quality, habitat)
- Verification approach:
  - Compliance criteria
  - Verification plan/methodology
- Approach to ensuring:
  - Additionality
  - Permanence
  - Leakage
  - Impacts of weather
- Plan for non-compliance

If the project is using a specific MMRV methodology or approach developed by the recipient, a project partner, or an outside organization, the project can submit documentation associated with the methodology as long as the documentation addresses each of the above categories.

If the project is tracking other environmental benefits (as reported in the *Additional Environmental Benefits* worksheet), include a description of the methodology and tools used to track and report on these benefits.

#### Field modeled GHG benefit reports

Results from any models besides COMET-Planner used to estimate GHG benefits must also be submitted as a separate report. This includes projects running COMET-Farm. The full results of any model can be submitted in the native/standard format generated by the modeling tool and must include the following Unique IDs in the report or in the file name: State, County, Farm ID, Tract ID, Field ID.

#### Field direct measurement results

For any direct physical measurements in the field, measurement results must be submitted as a separate report and must include the following Unique IDs in the report or in the file name: State, County, Farm ID, Tract ID, Field ID. Measurement results reports must include the name of the equipment used for sampling or data collection, the name of the lab that analyzed the data, and the analytical method used.

Sample report types include soil analysis reports, summarized results of portable emissions analyzers or flux towers, water quality analyses, and plant species counts. These could be collected for the purposes of determining GHG emission reductions or carbon sequestration amounts, for calibration of tools or models, for tracking other environmental benefits, or for other reasons.

 **Partnerships for Climate-Smart Commodities Data Dictionary for Recipients**  
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### Data Descriptions

This section provides descriptions and allowable response options for each data element. The guide also indicates whether each data element is required, applicable at times, or optional; as well as how frequently each data element must be updated.

### Unique IDs

**Project ID:** Unique ID at the project level – “Award Identifying Number” shown on award documentation

**Partner ID:** Unique ID at the partner level – use EIN; if no EIN, a unique ID will be assigned for use in these reports

**State or territory of operation:** State or territory name

**County of operation:** Physical county name

**Farm ID:** Unique ID at the operation level assigned by Farm Service Agency (FSA)

**Tract ID:** Unique ID at the tract level assigned by FSA

**Field ID:** Unique ID at the field level assigned by FSA



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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Project Summary**Commodity type****Data element name:** Commodity type**Reporting question:** What climate-smart commodity types are produced by this project?**Description:** Type of commodity incentivized by the project. These commodities include those for whom farmers are directly receiving incentives or other types of marketing support. See full list of commodity options in Appendix B. List one commodity per row.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:** FSA commodity list**Logic:** None – all respond**Required:** Yes**Data collection level:** Project**Data collection frequency:** Quarterly**Commodity sales****Data element name:** Commodity sales**Reporting question:** Did project activities result in sales this quarter of the commodity(ies) produced by this project?**Description:** Indicator of sales of commodity(ies) related to project activities. If sales are reported, complete the *Marketing Activities* worksheet (Table 3) as part of the quarterly performance report.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Yes
- No

**Logic:** None – all respond**Required:** Yes**Data collection level:** Project**Data collection frequency:** Quarterly**Farms enrolled****Data element name:** Farms enrolled**Reporting question:** Did the project enroll any producers or fields this quarter?**Description:** Indicator that the project enrolled producers or fields. If enrollment activities occurred this quarter, complete the *Producer Enrollment* and *Field Enrollment* worksheets (Tables 4 and 5) as part of the quarterly performance report.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Yes
- No

**Logic:** None – all respond**Required:** Yes**Data collection level:** Project**Data collection frequency:** Quarterly**GHG calculation methods****Data element name:** GHG calculation methods**Reporting question:** What methods is the project using to calculate GHG benefits?**Description:** List the way(s) that GHG benefits are being measured and calculated by the project this quarter.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Models
- Direct field measurements
- Both

**Logic:** None – all respond**Required:** Yes**Data collection level:** Project**Data collection frequency:** Quarterly



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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**GHG cumulative calculation****Data element name:** GHG cumulative calculation**Reporting question:** What method(s) was used to calculate the total cumulative GHG benefits reported here?**Description:** List the method(s) that was used to calculate the total cumulative GHG benefits reported by the project this quarter.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Models
- Direct field measurements
- Both

**Logic:** None – all respond**Required:** Yes**Data collection level:** Project**Data collection frequency:** Quarterly**Cumulative GHG benefits****Data element name:** Cumulative GHG benefits**Reporting question:** What are the project's estimated total GHG emission reductions (CO<sub>2</sub>eq) to date?**Description:** Total cumulative estimated greenhouse gas emission reductions from practice implementation. This is updated quarterly. If there are no changes, enter the same number as the previous quarter.**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Metric tons CO<sub>2</sub>eq**Allowed values:** 0-10,000,000**Logic:** None – all respond**Required:** Yes**Data collection level:** Project**Data collection frequency:** Quarterly**Cumulative carbon stock****Data element name:** Cumulative carbon stock**Reporting question:** How much carbon has the project sequestered to date?**Description:** Estimated total cumulative change in carbon stock based on practice implementation. This is updated quarterly. If there are no changes, enter the same numbers as the previous quarter. Conversion rate is one ton of carbon = 3.67 tons of CO<sub>2</sub>eq.**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Metric tons CO<sub>2</sub>eq**Allowed values:** 0-10,000,000**Logic:** None – all respond**Required:** Yes**Data collection level:** Project**Data collection frequency:** Quarterly**Cumulative CO<sub>2</sub> benefit****Data element name:** Cumulative CO<sub>2</sub> benefit**Reporting question:** What are the project's estimated total cumulative CO<sub>2</sub> emission reductions to date?**Description:** Estimated total cumulative carbon dioxide emission reductions based on practice implementation. This is updated quarterly. If there are no changes, enter the same number as the previous quarter.**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Metric tons CO<sub>2</sub>**Allowed values:** 0-10,000,000**Logic:** None – all respond**Required:** Yes**Data collection level:** Project**Data collection frequency:** Quarterly**Cumulative CH<sub>4</sub> benefit****Data element name:** Cumulative CH<sub>4</sub> benefit**Reporting question:** What are the project's estimated total CH<sub>4</sub> emission reductions to date?**Description:** Estimated total cumulative methane reduction based on practice implementation. This is updated quarterly. If there are no changes, enter the same numbers as the previous quarter. Conversion rate is one ton of CH<sub>4</sub> = 25 tons of CO<sub>2</sub>eq.**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Metric tons CH<sub>4</sub> reduced in CO<sub>2</sub>eq**Allowed values:** 0-10,000,000**Logic:** None – all respond**Required:** Yes**Data collection level:** Project**Data collection frequency:** Quarterly



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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**Cumulative N2O benefit**

<b>Data element name:</b> Cumulative N2O benefit	<b>Reporting question:</b> What are the project's estimated total N2O emission reductions to date?
<b>Description:</b> Estimated total cumulative nitrous oxide reduction based on practice implementation. This is updated quarterly. If there are no updated numbers enter the same number as the previous quarter. Conversion rate is one ton of N <sub>2</sub> O = 298 tons of CO <sub>2</sub> eq.	
<b>Data type:</b> Decimal	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Metric tons N2O reduced in CO <sub>2</sub> eq	<b>Allowed values:</b> 0-10,000,000
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Project	<b>Data collection frequency:</b> Quarterly

**Offsets produced**

<b>Data element name:</b> Offsets produced	<b>Reporting question:</b> How many carbon offsets have been produced in the project?
<b>Description:</b> Total carbon offsets produced by enrolled project fields during the quarter. Offsets are defined as having been verified and certified using an accepted standard and sold into the carbon marketplace.	
<b>Data type:</b> Decimal	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Metric tons CO <sub>2</sub> eq	<b>Allowed values:</b> 0-10,000,000
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Project	<b>Data collection frequency:</b> Quarterly

**Offsets sale**

<b>Data element name:</b> Offsets sale	<b>Reporting question:</b> To what marketplace(s) were carbon offsets sold?
<b>Description:</b> Marketplaces to which carbon offsets produced by enrolled project fields were sold. Offsets are defined as having been verified and certified using an accepted standard and sold into the carbon marketplace. List each marketplace name. Separate names with commas.	
<b>Data type:</b> Text	<b>Select multiple values:</b> NA
<b>Measurement unit:</b> Name	<b>Allowed values:</b> Text
<b>Logic:</b> Respond if >0 to 'Offsets produced'	<b>Required:</b> Yes
<b>Data collection level:</b> Project	<b>Data collection frequency:</b> Quarterly

**Offsets price**

<b>Data element name:</b> Offsets price	<b>Reporting question:</b> What was the average price of carbon received for offsets?
<b>Description:</b> Average price per metric ton paid for carbon offsets produced by enrolled project fields. Offsets are defined as having been verified and certified using an accepted standard and sold into the carbon marketplace.	
<b>Data type:</b> Decimal	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Dollars per metric ton	<b>Allowed values:</b> 0-500
<b>Logic:</b> Respond if >0 to 'Offsets produced'	<b>Required:</b> Yes
<b>Data collection level:</b> Project	<b>Data collection frequency:</b> Quarterly

**Insets produced**

<b>Data element name:</b> Insets produced	<b>Reporting question:</b> How many carbon insets have been produced in the project?
<b>Description:</b> Total carbon insets produced by enrolled fields during the quarter. Insets are defined as having been verified and certified using an accepted standard and accounted for within Scope 3 emissions for a firm.	
<b>Data type:</b> Decimal	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Metric tons CO <sub>2</sub> eq	<b>Allowed values:</b> 0-10,000,000
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Project	<b>Data collection frequency:</b> Quarterly



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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**Cost of on-farm TA**

**Data element name:** Cost of on-farm TA      **Reporting question:** What is the total amount that has been spent to provide on-farm TA?

**Description:** Total cost of any field- or practice-specific technical assistance provided by the project (by recipient or partners) to any producers. This is updated quarterly. If there are no changes, enter the same number as the previous quarter.

**Data type:** Decimal

**Select multiple values:** No

**Measurement unit:** Dollars

**Allowed values:** \$0-\$50,000,000

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Project

**Data collection frequency:** Quarterly

**MMRV cost**

**Data element name:** MMRV cost      **Reporting question:** What is the total amount that has been spent on MMRV activities?

**Description:** Total cost of all MMRV activities paid for by the project (recipient or partners). MMRV components are defined as measurement (calculations or estimations of GHG emissions), monitoring (ongoing review and confirmation that the climate-smart practices have been implemented according to the agreed upon standard and documentation of any changes in the site, implementation, or GHG emissions impacts over time), reporting (documenting and sharing monitoring and measurement results with project partners, the recipient, and any third-party verification organization), and verification (independent confirmation that measurement, monitoring and reporting information are complete, accurate and reliable). This is updated quarterly. If there are no changes, enter the same number as the previous quarter.

**Data type:** Decimal

**Select multiple values:** No

**Measurement unit:** Dollars

**Allowed values:** \$0-\$50,000,000

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Project

**Data collection frequency:** Quarterly

**GHG monitoring method**

**Data element name:** GHG monitoring 1-5      **Reporting question:** How did the project monitor GHG benefits?

**Description:** Up to the five most common forms of monitoring GHG benefits used this quarter as part of MMRV requirements. Monitoring is defined as ongoing review and confirmation that the climate-smart practice has been implemented according to the agreed upon standard and documentation of any changes in the site, implementation, or GHG emissions impacts over time. Include up to 5 methods, based on which methods are most commonly used for this project. The worksheet provides five columns with a drop-down list of the allowed values. Choose one value for each column. If fewer than 5 GHG monitoring methods are used, leave unnecessary columns blank. If "other" is chosen, use the additional column to enter other GHG monitoring methods as free text.

**Data type:** List

**Select multiple values:** No

**Measurement unit:** Category

**Allowed values:**

- Drones
- Ground-level photos and videos
- On-farm visit
- Plot-based sampling
- Producer records or attestation
- Satellite monitoring or remote sensing
- Soil metagenomics
- Soil sensors
- Water sensors
- Other (specify)

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Project

**Data collection frequency:** Quarterly



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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**GHG reporting method****Data element name:** GHG reporting 1-5**Reporting question:** How did the project track and report implementation of practices to reduce GHG emissions?

**Description:** Up to the five most common forms of tracking and reporting on practice implementation used this year as part of MMRV requirements. Reporting is defined as documenting and sharing monitoring and measurement results with project partners, the recipient, and any third-party verification organization. Include up to 5 methods, based on which methods are most commonly used for this project. The worksheet provides five columns with a drop-down list of the allowed values. Choose one value for each column. If fewer than 5 GHG reporting methods are used, leave unnecessary columns blank. If "other" is chosen, use the additional column to enter other GHG reporting methods as free text.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Automated devices
- Email
- Mobile app
- Paper
- Third-party actors
- Website
- Other (specify)

**Logic:** None – all respond**Required:** Yes**Data collection level:** Project**Data collection frequency:** Quarterly**GHG verification method****Data element name:** GHG verification method 1-5**Reporting question:** How did the project verify implementation of practices to reduce GHG emissions?

**Description:** Up to the five most common forms of verifying practice implementation used this year as part of MMRV requirements. Verification is defined as independent confirmation that measurement, monitoring and reporting information are complete, accurate and reliable. Include up to 5 methods, based on which methods are most commonly used for this project. The worksheet provides five columns with a drop-down list of the allowed values. Choose one value for each column. If fewer than 5 GHG verification methods are used, leave unnecessary columns blank. If "other" is chosen, use the additional column to enter other GHG verification methods as free text.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Artificial intelligence
- Audit by recipient
- Computer modeling
- Photos
- Record audit
- Satellite imagery
- Site or field visit
- Third-party audit
- Other (specify)

**Logic:** None – all respond**Required:** Yes**Data collection level:** Project**Data collection frequency:** Quarterly



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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Partner Activities**Unique IDs**

Partner ID	Unique Project ID for each partner
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**Partner name**

<b>Data element name:</b> Name of partner organization	<b>Reporting question:</b> What is the official name of the recipient or partner organization?
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**Description:** Legal name of recipient or partner organization

**Data type:** Text

**Select multiple values:** NA

**Measurement unit:** NA

**Allowed values:** Text

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Partner

**Data collection frequency:** Partnership initiation

**Partner type**

<b>Data element name:</b> Type of partner organization	<b>Reporting question:</b> What type of organization is this?
--	---

**Description:** Legal/financial structure of recipient or partner organization

**Data type:** List

**Select multiple values:** No

**Measurement unit:** Category

**Allowed values:**

- Commodity groups (501c5)
- For-profit
- Individual
- Nonprofit
- State or local agency
- Tribal agency
- University

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Partner

**Data collection frequency:** Partnership initiation

**Partner POC**

<b>Data element name:</b> Partner POC	<b>Reporting question:</b> Who is the point of contact for this project at the recipient or partner organization?
---------------------------------------	---

**Description:** Name of a point of contact for the recipient or partner organization

**Data type:** Text

**Select multiple values:** NA

**Measurement unit:** NA

**Allowed values:** Text

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Partner

**Data collection frequency:** Partnership initiation; update as necessary

**Partner POC email**

<b>Data element name:</b> Partner POC email	<b>Reporting question:</b> What is the point of contact's email address?
---	--

**Description:** Email of the point of contact for the recipient or partner organization

**Data type:** Text

**Select multiple values:** NA

**Measurement unit:** NA

**Allowed values:** Text

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Partner

**Data collection frequency:** Partnership initiation; update as necessary





## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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**Partnership start date**

<b>Data element name:</b> Partnership start date	<b>Reporting question:</b> When did the partnership start?
<b>Description:</b> Date that the partner organization and the recipient began formally partnering on the project	
<b>Data type:</b> Date	<b>Select multiple values:</b> NA
<b>Measurement unit:</b> MM/DD/YYYY	<b>Allowed values:</b> 01/01/2023 – 12/31/2030
<b>Logic:</b> No response for recipient	<b>Required:</b> Yes
<b>Data collection level:</b> Partner	<b>Data collection frequency:</b> Partnership initiation

**Partnership end date**

<b>Data element name:</b> Partnership end date	<b>Reporting question:</b> When did the partnership end?
<b>Description:</b> Date that the partner organization and the recipient stopped formally partnering on the project	
<b>Data type:</b> Date	<b>Select multiple values:</b> NA
<b>Measurement unit:</b> MM/DD/YYYY	<b>Allowed values:</b> 01/01/2023 – 12/31/2030
<b>Logic:</b> No response for recipient	<b>Required:</b> Yes
<b>Data collection level:</b> Partner	<b>Data collection frequency:</b> Partnership end quarter

**New partnership**

<b>Data element name:</b> New partnership	<b>Reporting question:</b> Is this a new partnership?
<b>Description:</b> A new partnership means that the recipient and the partner organization have not had a formal working relationship (under contract or on a grant) prior to the start of the project.	
<b>Data type:</b> List	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Category	<b>Allowed values:</b>
	<ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• I don't know</li> </ul>
<b>Logic:</b> No response for recipient	<b>Required:</b> Yes
<b>Data collection level:</b> Partner	<b>Data collection frequency:</b> Partnership initiation

**Partner total requested**

<b>Data element name:</b> Partner total requested	<b>Reporting question:</b> What is the total amount of funding the partner has requested to date from this project?
<b>Description:</b> Cumulative (total) amount of funds that the partner has requested reimbursement for from the recipient from the start of the partnership to the end of the reporting quarter. For each quarter's data entry, the value must be the sum of all previous entries plus the amount of funds requested in the reporting quarter. If there are no changes, report the value from the previous quarter.	
<b>Data type:</b> Decimal	<b>Select multiple values:</b> NA
<b>Measurement unit:</b> Dollars	<b>Allowed values:</b> \$0-\$100,000,000
<b>Logic:</b> No response for recipient	<b>Required:</b> Yes
<b>Data collection level:</b> Partner	<b>Data collection frequency:</b> Quarterly



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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**Total match contribution****Data element name:** Total match contribution**Reporting question:** What is the total match value the organization has contributed to the project to date?

**Description:** Cumulative (total) value of funds and in-kind contributions (e.g., staff time, inputs, equipment rental, marketing support) that the partner has provided as a project match contribution from the start of the partnership to the end of the reporting quarter. For each quarter's data entry, the value must be the sum of all previous entries plus match contributions in the reporting quarter. If there are no changes, report the value from the previous quarter.

**Data type:** Decimal**Select multiple values:** NA**Measurement unit:** Dollars**Allowed values:** \$0-\$100,000,000**Logic:** None – all respond**Required:** Yes**Data collection level:** Partner**Data collection frequency:** Quarterly**Total match incentives****Data element name:** Total match incentives**Reporting question:** What is the total value of match provided by this organization for producer incentives?

**Description:** Cumulative (total) value of funds for incentive payments directly to producers that the partner has provided as a project match contribution from the start of the partnership to the end of the reporting quarter. For each quarter's data entry, the value must be the sum of all previous entries plus match incentives in the reporting quarter. If there are no changes, report the value from the previous quarter.

**Data type:** Decimal**Select multiple values:** NA**Measurement unit:** Dollars**Allowed values:** \$0-\$100,000,000**Logic:** None – all respond**Required:** Yes**Data collection level:** Partner**Data collection frequency:** Quarterly**Match type****Data element name:** Match type 1-3**Reporting question:** What types of match contributions has the organization provided to the project?

**Description:** Types of match contributions *other than incentives* provided directly to producers by the organization from the start of the partnership to the end of the reporting quarter. Enter up to the top three (in dollar value) types of match contributions provided. In-kind staff time could be used for technical assistance, marketing assistance, or other support to producers. Production inputs include seed, fertilizer, pesticides, equipment and other inputs for use in the field. The worksheet provides three columns with a drop-down list of the allowed values. Choose one value for each column. If fewer than 3 match types are used, leave unnecessary columns blank. If "other" is chosen, use the additional column to enter other match types as free text.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Equipment rental or use
- In-kind staff time
- Production inputs (reduced cost or free)
- Program income
- Software
- Other (specify)

**Logic:** None – all respond**Required:** Yes**Data collection level:** Partner**Data collection frequency:** Quarterly



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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**Match amount**
**Data element name:** Match amount 1-3**Reporting question:** What is the value of the match contributions the organization provided to the project?

**Description:** Cumulative (total) value of funds for each match type that the organization has provided as a project match contribution from the start of the partnership to the end of the reporting quarter. Enter amounts for up to the top three (in dollar value) match types. The worksheet provides three columns for this data element. Enter one value for each column. If fewer than 3 match types are used, leave unnecessary columns blank.

**Data type:** Decimal**Select multiple values:** NA**Measurement unit:** Dollars**Allowed values:** \$0-\$100,000,000**Logic:** None – all respond**Required:** Yes**Data collection level:** Partner**Data collection frequency:** Quarterly

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**Training type provided**
**Data element name:** Training type 1-3 provided**Reporting question:** What types of training has the organization provided to project partners?

**Description:** Types of training provided to the project partner as a result of participating in the project during the past quarter. Training can come from the recipient, a project partner organization (including other divisions of their own organization, or an outside organization). Enter up to the top three (in dollar value) types of partner training provided. The worksheet provides three columns with a drop-down list of the allowed values. Choose one value for each column. If fewer than 3 training types are used, leave unnecessary columns blank. If “other” is chosen, use the additional column to enter other training types as free text.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Data collection
- Grant reporting
- Marketing opportunities
- Providing financial assistance
- Providing technical assistance
- Writing producer contracts
- Other (specify)

**Logic:** None – all respond**Required:** Yes**Data collection level:** Partner**Data collection frequency:** Quarterly

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**Activity by partner**
**Data element name:** Activity 1-3 by partner**Reporting question:** What types of activities has the organization provided to the project?

**Description:** Types of activities that the recipient or partner organization has provided during the reporting quarter. Enter up to the top three (in dollar value) types of activities undertaken. The worksheet provides three columns with a drop-down list of the allowed values. Choose one value for each column. If fewer than 3 activity types are used, leave unnecessary columns blank. If “other” is chosen, use the additional column to enter other activity types as free text.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Marketing support
- MMRV support
- Producer outreach for enrollment
- Technical assistance to producers
- Training to other partner organizations
- Other (specify)

**Logic:** None – all respond**Required:** Yes**Data collection level:** Partner**Data collection frequency:** Quarterly



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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**Activity cost****Data element name:** Activity cost 1-3**Reporting question:** What is the value of the activities this organization has provided to the project?

**Description:** Cumulative (total) cost of each activity type that the organization has undertaken or offered from the start of the partnership to the end of the reporting quarter. Enter amounts for up to the top three (in dollar value) activity types. The worksheet provides three columns for this data element. Enter one value for each column. If fewer than 3 activity types are provided, leave unnecessary columns blank.

**Data type:** Decimal**Select multiple values:** NA**Measurement unit:** Dollars**Allowed values:** \$0-\$100,000,000**Logic:** None – all respond**Required:** Yes**Data collection level:** Partner**Data collection frequency:** Quarterly**Products supplied****Data element name:** Products supplied**Reporting question:** What products or supplies were provided to enrolled fields?

**Description:** Name(s) of products supplied to enrolled producers as incentives or matching contributions. Enter the name of each product, including its brand. Separate each product name with a comma. If no products or supplies were provided by the organization, leave the column blank.

**Data type:** Text**Select multiple values:** NA**Measurement unit:** Name**Allowed values:** Text**Logic:** None – all respond**Required:** Yes**Data collection level:** Partner**Data collection frequency:** Quarterly**Product source****Data element name:** Product source**Reporting question:** Which companies provided the supplies?

**Description:** Name of firm or company from which supplies were obtained.

**Data type:** Text**Select multiple values:** NA**Measurement unit:** Name**Allowed values:** Text**Logic:** Respond if text entered for 'Products supplied'**Required:** Yes**Data collection level:** Partner**Data collection frequency:** Quarterly



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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Marketing Activities**Commodity type**

<b>Data element name:</b> Commodity type	<b>Reporting question:</b> What type of commodity is produced by the farmers enrolled in this project?
<b>Description:</b> List a single commodity produced or marketed through incentives from this project. If multiple commodities are produced by the project, use additional rows of the worksheet to report each commodity. Use the FSA commodity list in Appendix B and choose the commodity from the list.	
<b>Data type:</b> List	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Category	<b>Allowed values:</b> FSA commodity list
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Project	<b>Data collection frequency:</b> Quarterly

**Marketing channel type**

<b>Data element name:</b> Marketing channel type	<b>Reporting question:</b> What type of marketing channel is used to sell this commodity?
<b>Description:</b> List a single type of marketing channel used to sell the commodity produced by farmers enrolled in the project. If a single commodity is marketed through multiple channels, use additional rows of the worksheet to report each combination of commodity and marketing channel. If “other” is chosen, use the additional column to enter the other marketing channel type(s) as free text.	
<b>Data type:</b> List	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Category	<b>Allowed values:</b> <ul style="list-style-type: none"> <li>• Agricultural marketing board</li> <li>• Biorefinery</li> <li>• Commodity broker</li> <li>• Direct to consumer</li> <li>• Direct to institution</li> <li>• Direct to restaurant</li> <li>• Distributor (including grain elevators)</li> <li>• Food hub or cooperative</li> <li>• Food processor</li> <li>• Non-food byproducts processor</li> <li>• Retailer</li> <li>• USDA</li> <li>• Other (specify)</li> </ul>
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Project	<b>Data collection frequency:</b> Quarterly

**Number of buyers**

<b>Data element name:</b> Number of buyers	<b>Reporting question:</b> How many buyers are there in this marketing channel?
<b>Description:</b> List the number of individual firms or buyers in this marketing channel.	
<b>Data type:</b> Integer	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Count	<b>Allowed values:</b> 1-500
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Project	<b>Data collection frequency:</b> Quarterly



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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**Names of buyers**

<b>Data element name:</b> Names of buyers	<b>Reporting question:</b> What are the names of all of the buyers in this marketing channel?
<b>Description:</b> Provide the names of all buyers in this marketing channel. Separate each name with a comma.	
<b>Data type:</b> Text	<b>Select multiple values:</b> NA
<b>Measurement unit:</b> Name	<b>Allowed values:</b> Text
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Project	<b>Data collection frequency:</b> Quarterly

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**Marketing channel geography**

<b>Data element name:</b> Marketing channel geography	<b>Reporting question:</b> What is the primary geography of the marketing channel?
<b>Description:</b> The primary geography of the type of marketing channel. Primary geography means the scale at which most of the activity of buying and selling happens. Local means within a single state or directly neighboring states. Regional means within a five-to-ten state area. National means across the United States. International means specific locations outside of the United States. Global means across the world or not to a specific international location.	
<b>Data type:</b> List	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Category	<b>Allowed values:</b> <ul style="list-style-type: none"> <li>• Local</li> <li>• Regional</li> <li>• National</li> <li>• Global</li> </ul>
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Project	<b>Data collection frequency:</b> Quarterly

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**Value sold**


<b>Data element name:</b> Value sold	<b>Reporting question:</b> What is the value of the commodity sold in this marketing channel?
<b>Description:</b> The dollar value of the commodity sold in this marketing channel this quarter (non-cumulative).	
<b>Data type:</b> Decimal	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Dollars	<b>Allowed values:</b> \$1-\$100,000,000
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Project	<b>Data collection frequency:</b> Quarterly

---

**Volume sold**

<b>Data element name:</b> Volume sold	<b>Reporting question:</b> What is the volume of the commodity sold in this marketing channel?
<b>Description:</b> The volume of the commodity sold in this marketing channel this quarter (non-cumulative).	
<b>Data type:</b> Decimal	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Number	<b>Allowed values:</b> 1-100,000,000
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Project	<b>Data collection frequency:</b> Quarterly

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**Partnerships for Climate-Smart Commodities Data Dictionary for Recipients**  
 February 2023
**Volume sold unit****Data element name:** Volume sold unit**Reporting question:** What is the unit of volume?**Description:** The unit associated with the volume of the commodity sold in the marketing channel. If “other” is chosen, use the additional column to enter the appropriate unit as free text.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Bales (500 pounds)
- Bushels
- Carcass pounds
- Gallons
- Kilograms
- Linear board feet
- Liveweight pounds
- Metric tons
- Pounds
- Short tons
- Other (specify)

**Logic:** None – all respond**Required:** Yes**Data collection level:** Project**Data collection frequency:** Quarterly**Price premium****Data element name:** Price premium**Reporting question:** What price premium is received for the commodity sold in this marketing channel?**Description:** The price premium received for the commodity sold in this marketing channel this quarter. Price premium is the amount received above a ‘business as usual’ price.**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Dollars**Allowed values:** \$0.01-\$10,000**Logic:** None – all respond**Required:** Yes**Data collection level:** Project**Data collection frequency:** Quarterly**Price premium unit****Data element name:** Price premium unit**Reporting question:** What is the unit for the price premium?**Description:** The unit associated with the price premium for the commodity sold in the marketing channel. If “other” is chosen, use the additional column to enter the appropriate unit as free text.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Per bale (500 pounds)
- Per bushel
- Per carcass pound
- Per gallon
- Per kilogram
- Per linear board foot
- Per live pound
- Per metric ton
- Per ounce
- Per short ton
- Other (specify)

**Logic:** None – all respond**Required:** Yes**Data collection level:** Project**Data collection frequency:** Quarterly



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023

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**Price premium to producer**
**Data element name:** Price premium to producer**Reporting question:** What percent of the price premium is provided to the producer for the commodity sold in this marketing channel?**Description:** The percent of the price premium provided to the producer for the commodity sold in this marketing channel this quarter. Price premium is the amount received above a 'business as usual' price.**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Percent**Allowed values:** 0-100**Logic:** None – all respond**Required:** Yes**Data collection level:** Project**Data collection frequency:** Quarterly

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**Product differentiation method**
**Data element name:** Product differentiation method 1-3**Reporting question:** What methods are used to differentiate climate-smart commodities in this marketing channel?**Description:** Provide the methods used to differentiate the climate-smart commodity in this market channel. Product differentiation methods are ways to distinguish or differentiate the climate-smart commodity in the marketplace. Include up to 3 methods, based on which methods are most commonly used for this project. The worksheet provides three columns with a drop-down list of the allowed values. Choose one value for each column. If fewer than 3 product differentiation methods are used, leave unnecessary columns blank. If "other" is chosen, use the additional column to enter other product differentiation methods as free text.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Certification/verification for internal insetting
- Farm certification
- Label or badge used on packaging or marketing
- Third party certification/verification
- Trademark
- Other (specify)

**Logic:** None – all respond**Required:** Yes**Data collection level:** Project**Data collection frequency:** Quarterly

---

**Marketing method**
**Data element name:** Marketing method 1-3**Reporting question:** What methods are used to market climate-smart commodities in this marketing channel?**Description:** Provide the method(s) used to market this commodity in this market channel. Marketing method is the way that potential buyers of the climate-smart commodity are engaged by the project partners as the sellers or facilitators of sale. Include up to 3 methods, based on which methods are most commonly used for this project. The worksheet provides three columns with a drop-down list of the allowed values. Choose one value for each column. If fewer than 3 marketing methods are used, leave unnecessary columns blank. If "other" is chosen, use the additional column to enter other marketing methods as free text**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Label or badge used on packaging or marketing materials
- Marketing partnership (e.g., promotion by buyer)
- Print marketing campaign
- Social media and digital marketing campaign
- Verbal marketing campaign (e.g., radio, word of mouth)
- Other (specify)

**Logic:** None – all respond**Required:** Yes**Data collection level:** Project**Data collection frequency:** Quarterly





## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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**Marketing channel identification method**


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**Data element name:** Marketing channel identification method 1-3

**Reporting question:** What methods are used to generate interest in climate-smart commodities in this marketing channel?

**Description:** Provide the marketing channel identification method(s) used for this commodity in this market channel. Market channel identification methods are the ways that producers and project partners generate interest in purchasing the climate-smart commodity. Include up to 3 methods, based on which methods are most commonly used for this project. The worksheet provides three columns with a drop-down list of the allowed values. Choose one value for each column. If fewer than 3 marketing channel identification methods are used, leave unnecessary columns blank. If "other" is chosen, use the additional column to enter other marketing channel identification methods as free text

**Data type:** List

**Select multiple values:** No

**Measurement unit:** Category

**Allowed values:**

- Educational tours for buyers
- In-person lead generation
- Negotiated contracts with buyers
- Partnership network or project partner
- Other (specify)

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Project

**Data collection frequency:** Quarterly

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**Traceability method**


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**Data element name:** Traceability method 1-3

**Reporting question:** What traceability methods are used for climate-smart commodities in this channel?

**Description:** Provide the traceability method(s) used for the climate-smart commodity in this market channel. Traceability methods are ways to trace the climate-smart commodity or the climate-smart claims through the supply chain. Include up to 3 methods, based on which methods are most commonly used for this project. The worksheet provides three columns with a drop-down list of the allowed values. Choose one value for each column. If fewer than 3 traceability methods are used, leave unnecessary columns blank. If "other" is chosen, use the additional column to enter other traceability methods as free text.

**Data type:** List

**Select multiple values:** No

**Measurement unit:** Category

**Allowed values:**

- Barcode or unique ID
- Blockchain
- Book and claim
- Chain of custody
- Mass balance
- Recordkeeping
- Registry with certification
- Segregation
- Supply shed
- Volume proxy
- Other (specify)

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Project

**Data collection frequency:** Quarterly

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## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023

Producer Enrollment**Unique IDs**

Farm ID	Unique Farm ID assigned by FSA
State or territory	State name (must match FSA farm enrollment data)
County of residence	County name (must match FSA farm enrollment data)

**Producer data change**

<b>Data element name:</b> Producer data change	<b>Reporting question:</b> Is there new/updated information for a producer who is re-enrolling in the project?
<b>Description:</b> Indicates that there is new or updated information for a producer who had previously enrolled in the project and is re-enrolling.	
<b>Data type:</b> List	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Category	<b>Allowed values:</b> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Producer	<b>Data collection frequency:</b> Re-enrollment

**Producer start date**

<b>Data element name:</b> Producer start date	<b>Reporting question:</b> When did the producer enroll in the project?
<b>Description:</b> Date that the producer enrolled in the project by signing their first contract.	
<b>Data type:</b> Date	<b>Select multiple values:</b> NA
<b>Measurement unit:</b> MM/DD/YYYY	<b>Allowed values:</b> 01/01/2023 – 12/31/2030
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Producer	<b>Data collection frequency:</b> Initial enrollment

**Producer name**

<b>Data element name:</b> Producer name	<b>Reporting question:</b> What is the name of producer enrolled in the project?
<b>Description:</b> Name of the producer enrolled in the project; the name must match the name contained in the customer's Business Partner record and the Farm Operating Plan in FSA Business File for that Farm ID.	
<b>Data type:</b> Text	<b>Select multiple values:</b> NA
<b>Measurement unit:</b> NA	<b>Allowed values:</b> Text
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Producer	<b>Data collection frequency:</b> Initial enrollment


**Partnerships for Climate-Smart Commodities Data Dictionary for Recipients**  
 February 2023
**Underserved status****Data element name:** Underserved status**Reporting question:** Is this producer considered an underserved and/or a small producer?

**Description:** Underserved status of the primary operator of the enrolled operation. Underserved producers generally include beginning farmers, socially disadvantaged farmers, veteran farmers, and limited resource farmers; women farmers and producers growing specialty crops are generally also included in these categories. Small farms are generally those with less than \$350,000 in annual gross cash farm income. Indicate whether this producer is considered underserved, a small producer, or both underserved and a small producer. Use "I don't know" if the producer declines to answer. Departmental Regulation 4370-001 provides USDA's policies for collecting demographic data, including race, ethnicity and gender. Providing demographic information is voluntary and at the discretion of the customer. Demographic information is used by USDA for statistical purposes only and will not be used to determine an applicant's eligibility for programs or services for which they apply.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Yes, underserved
- Yes, small producer
- Yes, underserved and small producer
- No
- I don't know

**Logic:** None – all respond**Required:** No**Data collection level:** Producer**Data collection frequency:** Initial enrollment**Total area****Data element name:** Total area**Reporting question:** What is the total area of the farm?

**Description:** Total area of the farm associated with the Farm ID. Report total area of the farm, even if only a portion of the farm is enrolled in the project. If a producer is enrolled in the project for multiple years, review the total area each time a new contract is signed and provide any necessary updates.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Less than 1 acre
- 1 to 9 acres
- 10 to 49 acres
- 50 to 69 acres
- 70 to 99 acres
- 100 to 139 acres
- 140 to 179 acres
- 180 to 219 acres
- 220 to 259 acres
- 260 to 499 acres
- 500 to 999 acres
- 1,000 to 1,999 acres
- 2,000 to 4,999 acres
- 5,000 or more acres

**Logic:** None – all respond**Required:** Yes**Data collection level:** Producer**Data collection frequency:** Initial enrollment and subsequent enrollment(s), if applicable



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023

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**Total crop area**

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**Data element name:** Total crop area      **Reporting question:** What percent of the current operation is cropland?

**Description:** Area of the total farm that is currently used as cropland. If a producer is enrolled in the project for multiple years, review the total crop area each time a new contract is signed and provide any necessary updates.

**Data type:** Integer

**Select multiple values:** No

**Measurement unit:** Acres

**Allowed values:** 0-100,000

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Producer

**Data collection frequency:** Initial enrollment and subsequent enrollment(s), if applicable

---

**Total livestock area**

---

**Data element name:** Total livestock area      **Reporting question:** What amount of the current operation is used for livestock (by area)?

**Description:** Area of the total farm that is currently used for pasture, grazing, rangeland; or animal housing, feeding or milking. If a producer is enrolled in the project for multiple years, review the total livestock area each time a new contract is signed and provide any necessary updates.

**Data type:** Integer

**Select multiple values:** No

**Measurement unit:** Acres

**Allowed values:** 0-100,000

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Producer

**Data collection frequency:** Initial enrollment and subsequent enrollment(s), if applicable

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**Total forest area**

---

**Data element name:** Total forest area      **Reporting question:** What amount of the current operation is forested (by area)?

**Description:** Area of the total farm that is currently considered forest land use. Forest land use means that at least 10% of the land area is covered in trees that will be at least 13 feet tall when mature. If a producer is enrolled in the project for multiple years, review the total forest area each time a new contract is signed and provide any necessary updates.

**Data type:** Integer

**Select multiple values:** No

**Measurement unit:** Acres

**Allowed values:** 0-100,000

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Producer

**Data collection frequency:** Initial enrollment and subsequent enrollment(s), if applicable

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## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023

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**Livestock type**
**Data element name:** Livestock type 1-3**Reporting question:** What types of livestock are raised on the farm?

**Description:** Up to top three types of livestock (by head count) on the farm. The worksheet provides three columns with a drop-down list of the allowed values. Choose one value for each column. If there are fewer than 3 livestock types, leave unnecessary columns blank. If "other" is chosen, use the additional column to enter other livestock types as free text. If a producer is enrolled in the project for multiple years, review the livestock type each time a new contract is signed and provide any necessary updates.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Alpacas
- Beef cows
- Beefalo
- Buffalo or bison
- Chickens (broilers)
- Chickens (layers)
- Dairy cows
- Deer
- Ducks
- Elk
- Emus
- Equine
- Geese
- Goats
- Honeybees
- Llamas
- Reindeer
- Sheep
- Swine
- Turkeys
- Other (specify)

**Logic:** Respond if 'Total livestock area' >0**Required:** Yes**Data collection level:** Producer**Data collection frequency:** Initial enrollment and subsequent enrollment(s), if applicable

---

**Livestock head**
**Data element name:** Livestock head 1-3**Reporting question:** How many livestock (by type) are on this operation?

**Description:** Average annual head count for each type of livestock. Enter amounts for up to the top three livestock types by number. The worksheet provides three columns for this data element. Enter one value for each column. If there are fewer than 3 livestock types, leave unnecessary columns blank. If a producer is enrolled in the project for multiple years, review the average annual head count each time a new contract is signed and provide any necessary updates.

**Data type:** Integer**Select multiple values:** NA**Measurement unit:** Head count**Allowed values:** 1-10,000,000**Logic:** Respond if 'Total livestock area' >0**Required:** Yes**Data collection level:** Producer**Data collection frequency:** Initial enrollment and subsequent enrollment(s), if applicable



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023

**Organic farm****Data element name:** Organic farm**Reporting question:** Is any part of the farm currently USDA-certified organic or transitioning to USDA-certified organic?

**Description:** USDA-certified organic means that the farm has been certified by an accredited organic certifying agent or is transitioning to USDA-certified organic by not using any of the prohibited substances. Yes means that some or all of the farm is certified organic or transitioning to certified organic. No means that no part of the farm is certified organic or transitioning to certified organic. If a producer is enrolled in the project for multiple years, review the organic certification status of the farm each time a new contract is signed and provide any necessary updates.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Yes
- No
- I don't know

**Logic:** None – all respond**Required:** No**Data collection level:** Producer**Data collection frequency:** Initial enrollment and subsequent enrollment(s), if applicable**Organic fields****Data element name:** Organic fields**Reporting question:** Are any of the fields enrolled in the project currently USDA-certified organic or transitioning to USDA-certified organic?

**Description:** USDA-certified organic means that the operation has been certified by an accredited organic certifying agent or is transitioning to USDA-certified organic by not using any of the prohibited substances. Yes means that some or all of the fields enrolled in the project are certified organic or transitioning to certified organic. No means that no part of the fields enrolled in the project are certified organic or transitioning to certified organic. If a producer is enrolled in the project for multiple years, review the organic certification status of the enrolled fields each time a new contract is signed and provide any necessary updates.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Yes
- No
- I don't know

**Logic:** Respond if yes to 'Organic operation'**Required:** No**Data collection level:** Producer**Data collection frequency:** Initial enrollment and subsequent enrollment(s), if applicable**Producer motivation****Data element name:** Producer motivation**Reporting question:** Which of the following was the primary reason the producer enrolled in this project?**Description:** Primary operator's motivation for enrolling in the project.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Financial benefit
- Environmental benefit
- New market opportunity
- Partnerships or networks
- Other

**Logic:** None – all respond**Required:** Yes**Data collection level:** Producer**Data collection frequency:** Initial enrollment



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023

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**Producer outreach**

**Data element name:** Producer outreach 1-3      **Reporting question:** What types of outreach were provided to producers?

**Description:** Up to three most common types of outreach provided to producer prior to enrollment. Outreach activities are those focused on identifying and enrolling producers in the project. Outreach can come from the recipient or project partners. The worksheet provides three columns with a drop-down list of the allowed values. Choose one value for each column. If there are fewer than 3 outreach types, leave unnecessary columns blank. If "other" is chosen, use the additional column to enter other outreach types as free text.

**Data type:** List

**Select multiple values:** Yes

**Measurement unit:** Category

**Allowed values:**

- Commodity organizations
- Conferences
- Cooperative extension
- Digital communications and resources
- Education workshops, field days, and town halls
- Existing partner networks
- Farm visits and one-on-one meetings
- General advertising
- Peer referrals and producer groups
- Phone calls
- Print communications and resources
- Retailers
- State agencies
- Targeted messaging using proprietary data
- Technical service providers
- Other (specify)

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Producer

**Data collection frequency:** Initial enrollment

---

**CSAF experience**

**Data element name:** CSAF experience      **Reporting question:** Has the primary operator implemented CSAF practices in the last ten years anywhere on the farm?

**Description:** Has this farm implemented climate-smart agriculture or forestry (CSAF) practices anywhere on the farm in the past 10 years or since the current primary operator took control (whichever time period is shorter)? CSAF practices are included in a list in Appendix A.

**Data type:** List

**Select multiple values:** No

**Measurement unit:** Category

**Allowed values:**

- Yes
- No
- I don't know

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Producer

**Data collection frequency:** Initial enrollment

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## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023

**CSAF federal funds****Data element name:** CSAF federal funds**Reporting question:** Were prior CSAF practices supported by federal funds?

**Description:** If this farm (under the primary operator) has implemented CSAF practices in the last ten years, was implementation supported by federal funds? Federal funds are defined as being from programs including, but not limited to, those from the Natural Resources Conservation Service ((NRCS), including through Environmental Quality Incentives Program (EQIP), Conservation Stewardship Program (CSP), Regional Conservation Partnership Program (RCP), or related programs), the Farm Service Agency Conservation Reserve Program (CRP), as well as funds from other USDA programs or other federal agencies.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Yes
- No
- I don't know

**Logic:** Respond if yes to 'CSAF experience'**Required:** Yes**Data collection level:** Producer**Data collection frequency:** Initial enrollment**CSAF state or local funds****Data element name:** CSAF state or local funds**Reporting question:** Were prior CSAF practices supported by state or local funds?

**Description:** If this farm (under the primary operator) has implemented CSAF practices in the last ten years, was implementation supported by state funds? State or local funds are those from state departments of agriculture or other state agencies, local water quality districts and other local agencies.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Yes
- No
- I don't know

**Logic:** Respond if yes to 'CSAF experience'**Required:** Yes**Data collection level:** Producer**Data collection frequency:** Initial enrollment**CSAF nonprofit funds****Data element name:** CSAF nonprofit funds**Reporting question:** Were CSAF practices supported by nonprofit funds?

**Description:** If this farm (under the primary operator) has implemented CSAF practices in the last ten years, was implementation supported by nonprofit funds? Nonprofit funds are those offered directly from a nonprofit organization to a producer.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Yes
- No
- I don't know

**Logic:** Respond if yes to 'CSAF experience'**Required:** Yes**Data collection level:** Producer**Data collection frequency:** Initial enrollment





## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023

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**CSAF market incentives**


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**Data element name:** CSAF market incentives      **Reporting question:** Were CSAF practices supported by market incentives?

**Description:** If this farm (under the primary operator) has implemented CSAF practices in the last ten years, was implementation supported by market incentives? Market incentives include premiums paid by a commodity buyer or by a consumer based on branding or labeling as a climate-smart commodity.

**Data type:** List

**Select multiple values:** No

**Measurement unit:** Category

**Allowed values:**

- Yes
- No
- I don't know

**Logic:** Respond if yes to 'CSAF experience'

**Required:** Yes

**Data collection level:** Producer

**Data collection frequency:** Initial enrollment

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## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023

Field Enrollment**Unique IDs**

Farm ID	Unique Farm ID assigned by FSA
Tract ID	Unique Tract ID assigned by FSA
Field ID	Unique Field ID assigned by FSA
State or territory of field	State name (must match FSA farm enrollment data)
County of field	County name (must match FSA farm enrollment data)
Prior Field ID, if applicable	Prior Field ID assigned by FSA if there has been reconstitution of the farm resulting in a new Field ID during the field's enrollment in the project

**Field data change****Data element name:** Field data change**Reporting question:** Has the information previously reported for this field changed?**Description:** Indicator that this entry is being used to report any relevant changes, such as a new Field ID number or changes to the commodity or practice combinations, for a field that has previously been enrolled in the project.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Yes
- No

**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Re-enrollment**Contract start date****Data element name:** Contract start date**Reporting question:** What is the start date of the contract with the producer that includes this field?**Description:** Start date listed on the contract that enrolls the field in the project.**Data type:** Date**Select multiple values:** NA**Measurement unit:** MM/DD/YYYY**Allowed values:** 01/01/2023 – 12/31/2030**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Initial enrollment**Total field area****Data element name:** Total field area**Reporting question:** What is the total size of the enrolled field?**Description:** Total size of the field enrolled with the project.**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Acres**Allowed values:** .01-500**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Initial enrollment



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023

**Commodity category****Data element name:** Commodity category**Reporting question:** What category of commodity(ies) is (are) produced from this field?**Description:** Category of commodity(ies) produced in field enrolled in the project**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Crops
- Livestock
- Trees
- Crops and livestock
- Crops and trees
- Livestock and trees
- Crops, livestock and trees

**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Initial enrollment**Commodity type****Data element name:** Commodity type**Reporting question:** What type of commodity is produced from this field?**Description:** Type of commodity produced in field enrolled in the project. See full list in Appendix B. The worksheet provides a drop-down list of the allowed values. Choose the appropriate value. Enter additional commodities in subsequent rows.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:** FSA commodity list**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Initial enrollment**Baseline yield****Data element name:** Baseline yield**Reporting question:** What is the baseline yield of this field?**Description:** Average annual yield of commodity in 3 years prior to enrollment. Provide yield for the enrolled field if possible. If not at field level, provide average annual yield for the specific commodity for the operation.**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Production per acre or animal**Allowed values:** .01-100,000**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Initial enrollment



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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**Baseline yield unit****Data element name:** Baseline yield unit**Reporting question:** Baseline yield unit

**Description:** Unit of average annual yield of commodity in enrolled field in 3 years prior to enrollment. The worksheet provides a drop-down list of choices for this data element. If "other" is chosen, use the additional column to enter the appropriate yield unit as free text.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Animal units per acre
- Bushels per acre
- Carcass pounds per animal
- Head per acre
- Hundred-weights (or pounds) per head
- Linear feet per acre
- Liveweight pounds per animal
- Pounds per acre
- Tons per acre
- Other (specify)

**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Initial enrollment**Baseline yield location****Data element name:** Baseline yield location**Reporting question:** For what portion of the operation is the baseline yield being reported?

**Description:** Location of the reported average annual yield of commodity in 3 years prior to enrollment. If "other" is chosen, use the additional column to enter the appropriate location as free text.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Enrolled field
- Whole operation
- Other (specify)

**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Initial enrollment**Field land use****Data element name:** Field land use**Reporting question:** What is this field's land use history?

**Description:** Prior to enrollment, what was the most common land use for this field in the past 3 years?

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Crop land
- Forest land
- Non-agriculture
- Other agricultural land
- Pasture
- Range

**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Initial enrollment



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023

**Field irrigated****Data element name:** Field irrigated**Reporting question:** What is this field's irrigation history?**Description:** Prior to enrollment, what was the most common irrigation practice on this field the past 3 years?**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- No irrigation
- Center pivot
- Drip-subsurface
- Drip-surface
- Flood/border
- Furrow/ditch
- Lateral/linear sprinklers
- Micro-sprinklers
- Seepage
- Side roll
- Solid set sprinklers
- Supplemental
- Surface
- Traveling gun/towline
- Wheel Line
- Other

**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Initial enrollment**Field tillage****Data element name:** Field tillage**Reporting question:** What is this field's tillage history?**Description:** Prior to enrollment, what was the most common tillage approach during the past 3 years?**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- None
- Conventional, inversion
- Conventional, vertical
- No-till, direct seed
- Reduced till, inversion
- Reduced till, vertical
- Strip till
- Other

**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Initial enrollment



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023

**Practice past extent - farm****Data element name:** Practice past extent - farm**Description:** Prior to enrollment, on what portion of the whole farm had this (these) CSAF practice(s) ever been used by the primary operator? If multiple practices are planned to be implemented in this field, enter the value that best corresponds to the farm's prior experience with the planned set of practices.**Data type:** List**Measurement unit:** Category**Reporting question:** What percent of the farm has implemented this CSAF practice (combination) previously?**Select multiple values:** No**Allowed values:**

- Never used
- Used on less than 25% of operation
- Used on 25-50% of operation
- Used on 51-75% of operation
- Used on more than 75% of operation

**Required:** Yes**Logic:** None – all respond**Data collection level:** Field**Data collection frequency:** Initial enrollment**Field any CSAF practice****Data element name:** Field any CSAF practice**Description:** Prior to enrollment, have any CSAF practice or practices been used in this field in the past 3 years? CSAF practices are included in a list in Appendix A.**Data type:** List**Measurement unit:** Category**Reporting question:** What is this field's prior experience with CSAF practices?**Select multiple values:** No**Allowed values:**

- Yes
- No
- I don't know

**Required:** Yes**Logic:** None – all respond**Data collection level:** Field**Data collection frequency:** Initial enrollment**Practice past use - this field****Data element name:** Practice past use - this field**Description:** Prior to enrollment, had this (these) CSAF practice(s) been used in this field in the in the past 3 years? Enter yes if all of the practices had been used previously in this field; enter some if multiple practices are being implemented and one or more, but not all of the practices had been used previously in this field; and enter no if none of the practices had been used previously in this field.**Data type:** List**Measurement unit:** Category**Reporting question:** Have this CSAF practice (combination) been implemented previously in this field?**Select multiple values:** No**Allowed values:**

- Yes
- Some
- No
- I don't know

**Required:** Yes**Logic:** None – all respond**Data collection level:** Field**Data collection frequency:** Initial enrollment



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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**Practice type****Data element name:** Practice type 1-7**Reporting question:** What CSAF practice is being implemented in this field through the project?

**Description:** Which CSAF practice or practices will be implemented on this field as part of enrollment in the project? CSAF practices are included in a list in Appendix A. The worksheet provides seven columns for this data element. Enter one value for each column. If there are fewer than 7 practices being implemented on this field through enrollment in the project, leave unnecessary columns blank.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:** See list in Appendix A**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Initial enrollment**Practice standard****Data element name:** Practice standard 1-7**Reporting question:** What standard does the CSAF practice follow?

**Description:** Is the CSAF practice being implemented on the field as part of enrollment in the project following a defined practice standard? The worksheet provides seven columns for this data element. Enter one value for each column, corresponding to the practice types entered in the previous columns. If there are fewer than 7 practices being implemented on this field through enrollment in the project, leave unnecessary columns blank.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- NRCS
- Other (specify)

**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Initial enrollment**Planned practice implementation year****Data element name:** Practice 1-7 implementation year**Reporting question:** What year is the CSAF practice planned to be implemented?

**Description:** Year that the CSAF practice is planned to be implemented on the field. Use 2022 for early adopters, defined as fields that have the practice actively implemented in 2022 (prior to contract being signed for this project). The worksheet provides seven columns for this data element. Enter one value for each column, corresponding to the practice types entered in the previous columns. If there are fewer than 7 practices being implemented on this field through enrollment in the project, leave unnecessary columns blank.

**Data type:** Integer**Select multiple values:** No**Measurement unit:** Year**Allowed values:** 2022-2030**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Initial enrollment**Practice extent****Data element name:** Practice 1-7 extent**Reporting question:** To what extent is the practice implemented?

**Description:** Total area, length, or head where the practice is being implemented in the field specified by the contract.

**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Extent**Allowed values:** .01-100,000**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Initial enrollment



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023


**Practice extent unit****Data element name:** Practice 1-7  
extent unit**Reporting question:** Unit for extent of practice implementation**Description:** Unit for extent of practice implementation on the field specified by the contract. If "other" is chosen, use the additional column to enter the appropriate unit.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Acres
- Head of livestock
- Linear feet
- Square feet
- Other (specify)

**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Initial enrollmentCSAF Practice Sub-questions

For certain practices, additional questions are asked that provide information necessary to estimate greenhouse gas benefits from implementation of the practice. See Table 11 in the *CSAF Practice Sub-questions* section for descriptions of individual questions to be answered depending on the CSAF practices selected.




**Partnerships for Climate-Smart Commodities Data Dictionary for Recipients**  
 February 2023
Farm Summary**Unique IDs**

Farm ID	Unique Farm ID assigned by FSA
State or territory	State name (must match FSA farm enrollment data)
County of residence	County name (must match FSA farm enrollment data)

**Producer TA received**

**Data element name:** Producer TA received 1-3  
**Reporting question:** What types of technical assistance were provided to this producer?

**Description:** Did the recipient or any partner provide technical assistance (TA) to the producer this year? Technical assistance is any training, education, capacity building or other support provided by any project partner(s) directly to producers enrolled in the project. List up to the top three most common types of TA provided to this producer. The worksheet provides three columns with a drop-down list of the allowed values. Choose one value for each column. If there are fewer than 3 TA types, leave unnecessary columns blank. If "other" is chosen, use the additional column to enter other TA types as free text.

**Data type:** List

**Select multiple values:** No

**Measurement unit:** Category

**Allowed values:**

- Demonstration plots
- Equipment demonstrations
- Group field days or in-person field workshops
- Hotline
- One-on-one enrollment assistance
- One-on-one field visits
- One-on-one producer mentorship
- Producer networks and peer-to-peer groups
- Retailer consultation
- Social media/digital tools
- Train-the-trainer opportunities
- Virtual meetings or field days
- Webinars and videos
- Written materials
- None
- Other (specify)

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Producer

**Data collection frequency:** Quarterly

**Producer incentive amount**

**Data element name:** Producer incentive amount  
**Reporting question:** What is the total value of financial incentives provided to this producer?

**Description:** Total incentive payment received by the producer from USDA project funds for the year (non-cumulative). Do not include incentive payments made with partner match funds.

**Data type:** Decimal

**Select multiple values:** NA

**Measurement unit:** Dollars


**Allowed values:** \$0-\$5,000,000

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Producer

**Data collection frequency:** Quarterly


**Partnerships for Climate-Smart Commodities Data Dictionary for Recipients**  
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**Incentive reason**

**Data element name:** Incentive reason 1-4    **Reporting question:** Why were incentives provided to this producer?

**Description:** List up to four reasons for producer incentive payments. List the top 4 based on total value of the incentive for each reason. The worksheet provides four columns with a drop-down list of the allowed values. Choose one value for each column. If there are fewer than 4 reasons, leave unnecessary columns blank. If "other" is chosen, use the additional column to enter other reasons as free text.

**Data type:** List

**Select multiple values:** No

**Measurement unit:** Category

**Allowed values:**

- Avoided conversion
- Conference or training attendance
- Demographics/equity payment
- Enrollment
- Foregone revenue
- Historic data collection
- Identity preservation (supply chain tracing)
- Implementation of practices
- MMRV (e.g., data collection, reporting)
- Passing audit
- Price premium on output
- Yield change
- Other (specify)

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Producer

**Data collection frequency:** Quarterly

**Incentive structure**

**Data element name:** Incentive structure 1-4    **Reporting question:** What are the units for the financial incentives provided to this producer?

**Description:** List the structures (units) corresponding to the top 4 (by dollar value) incentive payments to producers. Production unit is weight or volume (bushel, kilogram, ton). The worksheet provides four columns with a drop-down list of the allowed values. Choose one value for each column. If there are fewer than 4 structure types, leave unnecessary columns blank. If "other" is chosen, use the additional column to enter other structure types as free text.

**Data type:** List

**Select multiple values:** No

**Measurement unit:** Category

**Allowed values:**

- Flat rate
- Per animal head
- Per area
- Per length
- Per production unit
- Per ton GHG
- Per tree
- Other (specify)

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Producer

**Data collection frequency:** Quarterly



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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**Incentive type**
**Data element name:** Incentive type 1-4**Reporting question:** What type of incentives were provided to each producer?

**Description:** List the top 4 types of incentive payments to producers (based on dollar value). The worksheet provides four columns with a drop-down list of the allowed values. Choose one value for each column. If there are fewer than 4 incentive types, leave unnecessary columns blank. If “other” is chosen, use the additional column to enter other incentive types as free text.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Cash payment
- Equipment loan
- Guaranteed commodity premium payment
- Inputs and supplies
- Land rental
- Loan
- Paid labor
- Post-harvest transportation
- Tuition or fees for training
- Other (specify)

**Logic:** None – all respond**Required:** Yes**Data collection level:** Producer**Data collection frequency:** Quarterly

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**Payment on enrollment**
**Data element name:** Payment on enrollment**Reporting question:** What portion of the financial incentive is provided to the producer upon enrollment in the project?

**Description:** Any incentive payment provided to the producer upon enrollment/signing a contract, and not related to any implementation, MMRV or sales activities. Full payment means the full incentive amount for any contract held by the producer is paid upon enrollment. Partial payment means that only part of the full incentive amount for any contract held by the producer is paid upon enrollment. No payment means that none of the full incentive amount for any contract held by the producer is paid upon enrollment.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Full payment
- Partial payment
- No payment

**Logic:** None – all respond**Required:** Yes**Data collection level:** Producer**Data collection frequency:** Quarterly

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**Payment on implementation**
**Data element name:** Payment on implementation**Reporting question:** What portion of the financial incentive is provided to the producer upon implementation of the practices?

**Description:** Any incentive payment provided to the producer upon implementing the practices included in the contract. Full payment means the full incentive amount for any contract held by the producer is paid upon implementation. Partial payment means that only part of the full incentive amount for any contract held by the producer is paid upon implementation. No payment means that none of the full incentive amount for any contract held by the producer is paid upon implementation.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Full payment
- Partial payment
- No payment

**Logic:** None – all respond**Required:** Yes**Data collection level:** Producer**Data collection frequency:** Quarterly



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023

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**Payment on harvest**

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**Data element name:** Payment on harvest**Reporting question:** What portion of the financial incentive is provided to the producer upon harvest of the commodity?**Description:** Any incentive payment provided to the producer upon harvesting or slaughtering the commodity included in the contract. Full payment means the full incentive amount for any contract held by the producer is paid upon harvest. Partial payment means that only part of the full incentive amount for any contract held by the producer is paid upon harvest. No payment means that none of the full incentive amount for any contract held by the producer is paid upon harvest.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Full payment
- Partial payment
- No payment

**Logic:** None – all respond**Required:** Yes**Data collection level:** Producer**Data collection frequency:** Quarterly

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**Payment on MMRV**

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**Data element name:** Payment on MMRV**Reporting question:** What portion of the financial incentive is provided to the producer upon completing MMRV requirements?**Description:** Any incentive payment provided to the producer upon completing the annual MMRV requirements included in the contract. Full payment means the full incentive amount for any contract held by the producer is paid upon MMRV being complete. Partial payment means that only part of the full incentive amount for any contract held by the producer is paid upon MMRV being complete. No payment means that none of the full incentive amount for any contract held by the producer is paid upon MMRV being complete.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Full payment
- Partial payment
- No payment

**Logic:** None – all respond**Required:** Yes**Data collection level:** Producer**Data collection frequency:** Quarterly

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**Payment on sale**


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**Data element name:** Payment on sale**Reporting question:** What portion of the financial incentive is provided to producer upon sale of the commodity?**Description:** Any incentive payment provided to the producer upon sale of the commodity included in the contract. Full payment means the full incentive amount for any contract held by the producer is paid upon sale. Partial payment means that only part of the full incentive amount for any contract held by the producer is paid upon sale. No payment means that none of the full incentive amount for any contract held by the producer is paid upon sale.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Full payment
- Partial payment
- No payment

**Logic:** None – all respond**Required:** Yes**Data collection level:** Producer**Data collection frequency:** Quarterly

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**Partnerships for Climate-Smart Commodities Data Dictionary for Recipients**  
 February 2023
Field Summary**Unique IDs**

Farm ID	Unique Farm ID assigned by FSA
Tract ID	Unique Tract ID assigned by FSA
Field ID	Unique Field ID assigned by FSA
State or territory of field	State name (must match FSA farm enrollment data)
County of field	County name (must match FSA farm enrollment data)

**Commodity type**

**Data element name:** Commodity type      **Reporting question:** What type of commodity is produced from this field?

**Description:** Type of commodity produced in field enrolled in the project. See full list in Appendix B. The worksheet provides multiple columns with a drop-down list of the allowed values. Choose one value for each column. Leave unnecessary columns blank.

**Data type:** List

**Select multiple values:** No

**Measurement unit:** Category

**Allowed values:** FSA commodity list

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Field

**Data collection frequency:** Quarterly

**Practice type**

**Data element name:** Field practice type 1-7      **Reporting question:** What CSAF practice is being implemented in this field through the project?

**Description:** Which climate-smart agriculture or forestry (CSAF) practice or practices are being implemented in this project? CSAF practices are included in a list in Appendix A. The worksheet provides seven columns for this data element. Enter one value for each column. If there are fewer than 7 practices being implemented on this field through enrollment in the project, leave unnecessary columns blank.

**Data type:** List

**Select multiple values:** No

**Measurement unit:** Category

**Allowed values:** See list in Appendix A

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Field

**Data collection frequency:** Quarterly

**Date practice complete**

**Data element name:** Date practice complete      **Reporting question:** When did the project certify CSAF practice implementation as complete?

**Description:** Date that the project certifies that implementation of the CSAF practice is complete on the field. Use January of the year prior to contract year for early adopters, defined as fields that have the practice actively implemented in the year prior to a contract associated with this project is signed). The worksheet provides seven columns for this data element. Enter one value for each column, corresponding to the practice types entered in the previous columns. If there are fewer than 7 practices being implemented on this field through enrollment in the project, leave unnecessary columns blank.

**Data type:** Date

**Select multiple values:** No

**Measurement unit:** MM/DD/YYYY

**Allowed values:** 01/01/2023 – 12/31/2030

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Field

**Data collection frequency:** Quarterly



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023

**Contract end date****Data element name:** Contract end date**Reporting question:** Contract end date**Description:** End date listed on the contract that enrolls the field in the project. If contract end date changes, submit updated end date during the next quarter's reporting.**Data type:** Date**Select multiple values:** No**Measurement unit:** MM/DD/YYYY**Allowed values:** 01/01/2023 – 12/31/2030**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Quarterly**MMRV assistance provided****Data element name:** MMRV assistance provided**Reporting question:** Was MMRV assistance provided?**Description:** Was any MMRV assistance provided to the primary operator for this field? MMRV assistance includes in-field support for the use of technologies, consultation on data collection and input, and other support related to MMRV. MMRV is defined a measurement (calculations or estimations of GHG emissions), monitoring (ongoing review and confirmation that the climate-smart practice has been implemented according to the agreed upon standard and documentation of any changes in the site, implementation, or GHG emissions impacts over time), reporting (documenting and sharing monitoring and measurement results with project partners, the recipient, and any third-party verification organization), and verification (independent confirmation that measurement, monitoring and reporting information are complete, accurate and reliable).**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Yes
- No
- I don't know

**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Quarterly**Marketing assistance provided****Data element name:** Marketing assistance provided**Reporting question:** Was marketing assistance provided?**Description:** Was any marketing assistance provided to the primary operator for the commodity(ies) produced from this field? Marketing assistance includes guaranteeing the sale of the commodity(ies), providing a platform for the sale of the commodity(ies), providing a label, branding, or other support related to marketing.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Yes
- No
- I don't know

**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Quarterly**Incentive per acre or head****Data element name:** Incentive per acre or head**Reporting question:** Is this field receiving a per-acre or per-head incentive?**Description:** Is this field receiving an incentive payment to implement a specific CSAF practice or set of practices on a per-acre or per-head (livestock) basis?**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Yes
- No
- I don't know

**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Quarterly



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February 2023

**Field commodity value**

<b>Data element name:</b> Field commodity value	<b>Reporting question:</b> What is the value of the commodity produced on the enrolled field?
<b>Description:</b> The dollar value of the commodity produced on the enrolled field.	
<b>Data type:</b> Decimal	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Dollars	<b>Allowed values:</b> \$1-\$10,000,000
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Quarterly

**Field commodity volume**


<b>Data element name:</b> Field commodity volume	<b>Reporting question:</b> What is the volume of commodity produced on the enrolled field?
<b>Description:</b> The volume of the commodity produced on the enrolled field	
<b>Data type:</b> Decimal	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Number	<b>Allowed values:</b> 1-10,000,000
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Quarterly

**Field commodity volume unit**

<b>Data element name:</b> Field commodity volume unit	<b>Reporting question:</b> What is the unit of volume?
<b>Description:</b> The unit associated with the volume of the commodity produced on the enrolled field. If “other” is chosen, enter the appropriate value in the additional column.	
<b>Data type:</b> List	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Category	<b>Allowed values:</b> <ul style="list-style-type: none"> <li>• Bushels</li> <li>• Carcass weight pounds</li> <li>• Gallons</li> <li>• Head</li> <li>• Linear feet</li> <li>• Liveweight pounds</li> <li>• Pounds</li> <li>• Tons</li> <li>• Other (specify)</li> </ul>
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Quarterly

**Cost of implementation**

<b>Data element name:</b> Cost of implementation	<b>Reporting question:</b> What is the cost of practice implementation in the field?
<b>Description:</b> Total annual estimated cost per unit of implementing the practice(s) in the enrolled field.	
<b>Data type:</b> Decimal	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Dollars	<b>Allowed values:</b> \$1-\$10,000,000
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Quarterly


**Partnerships for Climate-Smart Commodities Data Dictionary for Recipients**  
 February 2023
**Cost unit****Data element name:** Cost unit**Reporting question:** What is the unit for cost?**Description:** The unit associated with the cost of implementing CSAF practices in the field. If "other" is chosen, enter the appropriate value in the additional column.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Per acre
- Per bushel
- Per head
- Per linear foot
- Per pound
- Per ton
- Other (specify)

**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Quarterly**Cost coverage****Data element name:** Cost coverage**Reporting question:** What percent of the practice cost is covered by the incentive?**Description:** Estimated proportion of total annual cost of implementing the practice(s) that is covered by project incentives.**Data type:** Integer**Select multiple values:** No**Measurement unit:** Percent**Allowed values:** 0-100**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Quarterly**Field GHG monitoring****Data element name:** Field GHG monitoring 1-3**Reporting question:** How were GHG impacts monitored in this field?**Description:** Up to the top three forms of monitoring GHG benefits as part of MMRV requirements. Monitoring is defined as ongoing review and confirmation that the climate-smart practice has been implemented according to the agreed upon standard and documentation of any changes in the site, implementation, or GHG emissions impacts over time. Include up to 3 methods, based on which methods are most commonly used for this field. The worksheet provides three columns with a drop-down list of the allowed values. Choose one value for each column. If fewer than 3 GHG monitoring methods are used, leave unnecessary columns blank. If "other" is chosen, use the additional column to enter other GHG monitoring methods as free text.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Drones
- Ground-level photos and videos
- On-farm inspection
- Plot-based sampling (e.g., soil, water)
- Producer records or attestation
- Satellite monitoring or remote sensing
- Soil metagenomics
- Soil sensors
- Water sensors
- Other (specify)

**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Quarterly





## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023

**Field GHG reporting****Data element name:** Field GHG reporting 1-3**Reporting question:** How were GHG benefits reported for this field?

**Description:** Up to the top three forms of reporting on GHG benefits as part of MMRV requirements. Reporting is defined as documenting and sharing monitoring and measurement results with project partners, the recipient, and any third-party verification organization. Include up to 3 methods, based on which methods are most commonly used for this field. The worksheet provides three columns with a drop-down list of the allowed values. Choose one value for each column. If fewer than 3 GHG reporting methods are used, leave unnecessary columns blank. If "other" is chosen, use the additional column to enter other GHG reporting methods as free text.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Automated devices
- Email
- Mobile app
- Paper
- Third-party actors
- Website
- Other (specify)

**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Quarterly**Field GHG verification****Data element name:** Field GHG verification 1-3**Reporting question:** How was implementation of practices to reduce GHG emissions verified for this field?

**Description:** Up to the top three of verification of GHG benefits as part of MMRV requirements. Verification is defined as independent confirmation that measurement, monitoring and reporting information are complete, accurate and reliable. Include up to 3 methods, based on which methods are most commonly used for this field. The worksheet provides three columns with a drop-down list of the allowed values. Choose one value for each column. If fewer than 3 GHG verification methods are used, leave unnecessary columns blank. If "other" is chosen, use the additional column to enter other GHG verification methods as free text.

**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Artificial intelligence
- Computer modeling
- Recipient audit
- Photos
- Record audit
- Satellite imagery
- Site or field visit
- Third-party audit
- Other (specify)

**Logic:** None – all respond**Required:** Yes**Data collection level:** Field**Data collection frequency:** Quarterly



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023

**Field GHG calculations**

<b>Data element name:</b> Field GHG calculations	<b>Reporting question:</b> What methods are used to calculate GHG benefits in this field?
<b>Description:</b> List the method(s) used to calculate GHG benefits in this field. If yes to direct physical measurements, submit result reports (see <i>Supplemental Data Submission – Field direct GHG measurement results</i> ).	
<b>Data type:</b> List	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Category	<b>Allowed values:</b> <ul style="list-style-type: none"> <li>• Models</li> <li>• Direct field measurements</li> <li>• Both</li> </ul>
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Quarterly

**Field official GHG calculation**


<b>Data element name:</b> Field official GHG calculation	<b>Reporting question:</b> What method was used to calculate the official GHG benefits in this field?
<b>Description:</b> List the method used to calculate the official GHG benefits in this field that are reported as part of the project's aggregate impact.	
<b>Data type:</b> List	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Category	<b>Allowed values:</b> <ul style="list-style-type: none"> <li>• Models</li> <li>• Direct field measurements</li> </ul>
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Quarterly

**Field official GHG ER**

<b>Data element name:</b> Field official GHG emission reductions	<b>Reporting question:</b> What are the estimated total GHG emission reductions (CO <sub>2</sub> eq) in this field?
<b>Description:</b> Estimated greenhouse gas emission reductions from practice implementation in this field that are reported as part of the project's aggregate impact. This data element must be entered upon practice completion or annually, as appropriate.	
<b>Data type:</b> Decimal	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Metric tons CO <sub>2</sub> eq	<b>Allowed values:</b> 0-10,000,000
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Quarterly

**Field official carbon stock**

<b>Data element name:</b> Field official carbon stock	<b>Reporting question:</b> How much carbon has been sequestered in this field?
<b>Description:</b> Estimated total change in carbon stock based on practice implementation in this field. This data element can be reported in any quarter and is cumulative for the year. Conversion rate is one ton of carbon = 3.67 tons of CO <sub>2</sub> eq.	
<b>Data type:</b> Decimal	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Metric tons CO <sub>2</sub> eq	<b>Allowed values:</b> 0-10,000,000
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Quarterly


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 February 2023
**Field official CO2 ER**

<b>Data element name:</b> Field official CO2 emission reductions	<b>Reporting question:</b> What are the estimated total CO2 emission reductions in this field?
<b>Description:</b> Estimated total carbon dioxide emission reductions based on practice implementation in this field that are reported as part of the project's aggregate impact. This data element must be entered upon practice completion or annually, as appropriate.	
<b>Data type:</b> Decimal	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Metric tons CO <sub>2</sub>	<b>Allowed values:</b> 0-10,000,000
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Quarterly

**Field official CH4 ER**

<b>Data element name:</b> Field official CH4 emission reductions	<b>Reporting question:</b> What are the estimated total CH4 emission reductions in this field?
<b>Description:</b> Estimated total methane emission reductions based on practice implementation in this field that are reported as part of the project's aggregate impact. This data element must be entered upon practice completion or annually, as appropriate. Conversion rate is one ton of CH <sub>4</sub> = 25 tons of CO <sub>2</sub> eq.	
<b>Data type:</b> Decimal	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Metric tons CH4 reduced in CO <sub>2</sub> eq	<b>Allowed values:</b> 0-10,000,000
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Quarterly

**Field official N2O ER**

<b>Data element name:</b> Field official N2O emission reductions	<b>Reporting question:</b> What are the estimated total N2O emission reductions in this field?
<b>Description:</b> Estimated total nitrous oxide emission reductions based on practice implementation in this field that are reported as part of the project's aggregate impact. This data element must be entered upon practice completion or annually, as appropriate. Conversion rate is one ton of N <sub>2</sub> O = 298 tons of CO <sub>2</sub> eq.	
<b>Data type:</b> Decimal	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Metric tons N2O reduced in CO <sub>2</sub> eq	<b>Allowed values:</b> 0-10,000,000
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Quarterly

**Field offsets produced**

<b>Data element name:</b> Field offsets produced	<b>Reporting question:</b> How many carbon offsets have been produced in this field?
<b>Description:</b> Total carbon offsets produced in the field during the quarter (not cumulative). Offsets are defined as having been verified and certified using an accepted standard and sold into the carbon marketplace.	
<b>Data type:</b> Decimal	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Metric tons CO <sub>2</sub> eq	<b>Allowed values:</b> 0-10,000,000
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Quarterly



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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**Field insets produced**


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**Data element name:** Field insets produced      **Reporting question:** How many carbon insets have been produced in this field?

**Description:** Total carbon insets produced in the field during the quarter (not cumulative). Insets are defined as having been verified and certified using an accepted standard and accounted for within Scope 3 emissions for a firm.

**Data type:** Decimal

**Select multiple values:** No

**Measurement unit:** Metric tons CO<sub>2</sub>eq

**Allowed values:** 0-10,000,000

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Field

**Data collection frequency:** Quarterly

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**Other field measurement**


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**Data element name:** Other field measurement      **Reporting question:** Were data collected from the field for reasons other than GHG benefit estimation?

**Description:** Direct physical measurements or data collection taken in the field for any reason other than GHG benefits estimation. These reasons could include calibration of GHG estimation tools or models, tracking other environmental benefits (see Field environmental benefits report), and other reasons. If yes, submit corresponding reports (see *Supplemental data submission - Field direct measurement results*).

**Data type:** List

**Select multiple values:** No

**Measurement unit:** Category

**Allowed values:**

- Yes
- No
- I don't know

**Logic:** None – all respond

**Required:** Yes

**Data collection level:** Field

**Data collection frequency:** Quarterly

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## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023

GHG Benefits - Alternate Modeled**Unique IDs**

Farm ID	Unique Farm ID assigned by FSA
Tract ID	Unique Tract ID assigned by FSA
Field ID	Unique Field ID assigned by FSA
State or territory of field	State name (must match FSA farm enrollment data)
County of field	County name (must match FSA farm enrollment data)

**Commodity type**

<b>Data element name:</b> Commodity type 1-6	<b>Reporting question:</b> What type of commodity(ies) is produced from this field?
<b>Description:</b> Type of commodity(ies) produced in field enrolled in the project. See full list of commodity options in Appendix B. The worksheet provides multiple columns with drop-down lists of the allowed values. Choose one value for each column. Leave unnecessary columns blank	
<b>Data type:</b> List	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Category	<b>Allowed values:</b> FSA commodity list
<b>Logic:</b> None – all respond	<b>Required:</b> If project calculates GHG benefits using multiple methods
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Annual

**Practice type**

<b>Data element name:</b> Practice type 1-7	<b>Reporting question:</b> What CSAF practice is being implemented by this project?
<b>Description:</b> Which CSAF practice or practices are being implemented in this project? CSAF practices are included in a list in Appendix A. The worksheet provides seven columns for this data element. Enter one value for each column. If there are fewer than 7 practices being implemented by the project, leave unnecessary columns blank.	
<b>Data type:</b> List	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Category	<b>Allowed values:</b> See list in Appendix A
<b>Logic:</b> None – all respond	<b>Required:</b> If project calculates GHG benefits using multiple methods
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Annual




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**GHG model**

**Data element name:** GHG model      **Reporting question:** What model was used for alternate calculation of GHG benefits?

**Description:** Select the model used for the alternate calculation of the field's GHG benefits.

**Data type:** List

**Select multiple values:** No

**Measurement unit:** Category

**Allowed values:**

- ACC Calculator
- Agriculture, Forestry and Other Land Use (AFOLU) Carbon Calculator
- AIRES
- APEX
- Bowen Ratio Energy Balance
- Carat-Calculator
- CArPE
- CDFA web-based calculator
- COMET-Farm
- COMET-Planner
- CoolFarm
- Cover Crop Explore
- CropTrak
- CultivateAI's FMIS
- DayCent-CR
- DNDC
- DSSAT
- Earth Optics
- EcoPractices
- EPIC
- Extrapolation based on literature
- FieldPrint
- Granular
- GREET
- gTIR
- IFSM
- IPCC default emissions factors & models
- itree
- Nitrogen Balance
- Nutrient Tracking Tool (NTT)
- RCD Project Tracker
- Revised Universal Soil Loss equation 2 (RUSLE2)
- RuFaS
- SAFE-Link
- SALUS (CIBO)
- SNAPGRAZE
- SquareRoots
- SWAT-C
- SYMFONI
- Truterra Sustainability Tool
- Verra
- WEPP
- YardStick
- Other (specify)

**Logic:** None – all respond

**Required:** If project calculates GHG benefits using multiple methods

**Data collection level:** Field

**Data collection frequency:** Annual

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## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023

**Model start date****Data element name:** Model start date**Reporting question:** For what time period are the GHG benefits modeled (model start date)?**Description:** Date that the model parameters begin.**Data type:** Date**Select multiple values:** NA**Measurement unit:** MM/DD/YYYY**Allowed values:** 01/01/1950 – 12/31/2030**Logic:** None – all respond**Required:** If project calculates GHG benefits using multiple methods**Data collection level:** Field**Data collection frequency:** Annual**Model end date****Data element name:** Model end date**Reporting question:** For what time period are the GHG benefits modeled (model end date)?**Description:** Date that the model parameters end.**Data type:** Date**Select multiple values:** NA**Measurement unit:** MM/DD/YYYY**Allowed values:** 01/01/2023– 12/31/2030**Logic:** None – all respond**Required:** If project calculates GHG benefits using multiple methods**Data collection level:** Field**Data collection frequency:** Annual**Total GHG benefits estimated****Data element name:** Total GHG benefits estimated**Reporting question:** What is the alternate estimate of the field's total GHG emission reductions?**Description:** Total greenhouse gas emission reductions from practice implementation in the field estimated using an alternate model.**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Metric tons CO<sub>2</sub>eq**Allowed values:** 0-10,000,000**Logic:** None – all respond**Required:** If project calculates GHG benefits using multiple methods**Data collection level:** Field**Data collection frequency:** Annual**Total carbon stock estimated****Data element name:** Total carbon stock estimated**Reporting question:** What is the alternate estimate of how much carbon has the field has sequestered?**Description:** Total change in carbon stock based on practice implementation in the field estimated using an alternate model. Conversion rate is one ton of carbon = 3.67 tons of CO<sub>2</sub>eq.**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Metric tons CO<sub>2</sub>eq**Allowed values:** 0-10,000,000**Logic:** None – all respond**Required:** If project calculates GHG benefits using multiple methods**Data collection level:** Field**Data collection frequency:** Annual**Total CO<sub>2</sub> estimated****Data element name:** Total CO<sub>2</sub> estimated**Reporting question:** What is the alternate estimate of the field's total CO<sub>2</sub> emission reductions?**Description:** Total carbon dioxide emission reductions based on practice implementation in the field estimated using an alternate model.**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Metric tons CO<sub>2</sub>**Allowed values:** 0-10,000,000**Logic:** None – all respond**Required:** If project calculates GHG benefits using multiple methods**Data collection level:** Field**Data collection frequency:** Annual



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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**Total CH4 estimated**

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**Data element name:** Total CH4 estimated**Reporting question:** What is the alternate estimate of the field's total CH4 emission reductions?**Description:** Total methane emission reductions based on practice implementation in the field estimated using an alternate model. Conversion rate is one ton of CH<sub>4</sub> = 25 tons of CO<sub>2</sub>eq.**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Metric tons CH4 reduced in CO<sub>2</sub>eq**Allowed values:** 0-10,000,000**Logic:** None – all respond**Required:** If project calculates GHG benefits using multiple methods**Data collection level:** Field**Data collection frequency:** Annual

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**Total field N2O estimated**

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**Data element name:** Total N2O estimated**Reporting question:** What is the alternate estimate of the field's total N2O emission reductions?**Description:** Total nitrous oxide emission reductions based on practice implementation in the field estimated using an alternate method. Conversion rate is one ton of N<sub>2</sub>O = 298 tons of CO<sub>2</sub>eq.**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Metric tons N2O reduced in CO<sub>2</sub>eq**Allowed values:** 0-10,000,000**Logic:** None – all respond**Required:** If project calculates GHG benefits using multiple methods**Data collection level:** Field**Data collection frequency:** Annual

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## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023

GHG Benefits - Measured**Unique IDs**

Farm ID	Unique Farm ID assigned by FSA
Tract ID	Unique Tract ID assigned by FSA
Field ID	Unique Field ID assigned by FSA
State or territory of field	State name (must match FSA farm enrollment data)
County of field	County name (must match FSA farm enrollment data)

**GHG measurement method****Data element name:** GHG measurement method**Reporting question:** What measurement method is used to calculate GHG benefits?**Description:** Field-based measurement method used to calculate GHG benefits. If "other" is chosen, enter the appropriate value as free text in the additional column.**Data type:** List**Measurement unit:** Category**Select multiple values:** No**Allowed values:**

- Emissions measurement unit
- Flux towers
- Litterbags
- Plant measurements
- Portable emissions analyzers
- Soil flux chambers
- Soil samples
- Soil sensors
- Vehicle-mounted sensors
- Other (specify)

**Required:** If a project conducts soil samples or takes carbon stock or greenhouse gas emission measurements in this field**Logic:** None – all respond**Data collection level:** Field**Data collection frequency:** Annual**Lab name****Data element name:** Lab name**Reporting question:** What is the name of the lab that processed the measurement samples?**Description:** Name of entity that received data and conducted analysis of samples.**Data type:** Text**Select multiple values:** No**Measurement unit:** NA**Allowed values:** Free text**Logic:** None – all respond**Required:** If applicable**Data collection level:** Field**Data collection frequency:** Annual



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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**Measurement start date****Data element name:** Measurement start date**Reporting question:** On what date did the measurement start?**Description:** Date that the measurements began. If it was a single point in time, use the same date for start date and end date. If multiple measurements took place over a time period, use the date that the measurements first began.**Data type:** Date**Select multiple values:** No**Measurement unit:** MM/DD/YYYY**Allowed values:** 01/01/2023 – 12/31/2030**Logic:** None – all respond**Required:** If a project conducts soil samples or takes carbon stock or greenhouse gas emission measurements in this field**Data collection level:** Field**Data collection frequency:** Annual**Measurement end date****Data element name:** Measurement end date**Reporting question:** On what date did the measurement end?**Description:** Date that the measurements began. If it was a single point in time, use the same date for start date and end date. If multiple measurements took place over a time period, use the date that the measurements were completed.**Data type:** Date**Select multiple values:** No**Measurement unit:** MM/DD/YYYY**Allowed values:** 01/01/2023– 12/31/2030**Logic:** None – all respond**Required:** If a project conducts soil samples or takes carbon stock or greenhouse gas emission measurements in this field**Data collection level:** Field**Data collection frequency:** Annual**Total CO2 reduction calculated****Data element name:** Total CO2 reduction calculated**Reporting question:** What are the total measured CO2 emission reductions?**Description:** Total annual CO2 emission reductions based on practice implementation in the field calculated from in-field measurements.**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Metric tons CO<sub>2</sub>**Allowed values:** 0-10,000,000**Logic:** None – all respond**Required:** If a project takes carbon stock or greenhouse gas emission measurements in this field**Data collection level:** Field**Data collection frequency:** Annual**Total field carbon stock measured****Data element name:** Total field carbon stock measured**Reporting question:** What is the total amount of carbon sequestered based on repeat measurements in this field?**Description:** Change in carbon stock based on practice implementation in the field calculated from repeat soil sampling in this field. (Results for initial field soil samples should be reported in the 'Soil sample result' and 'Measurement type' columns.) Conversion rate is one ton of carbon = 3.67 tons of CO<sub>2</sub>eq.**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Metric tons CO<sub>2</sub>eq**Allowed values:** 0-10,000,000**Logic:** None – all respond**Required:** If a project conducts soil samples or takes carbon stock measurements in this field**Data collection level:** Field**Data collection frequency:** Annual



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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**Total CH4 reduction calculated**
**Data element name:** Total CH4 reduction calculated**Reporting question:** What are the total measured CH4 emission reductions?**Description:** Total annual methane emission reductions based on practice implementation in the field calculated from in-field measurements. Conversion rate is one ton of CH<sub>4</sub> = 25 tons of CO<sub>2</sub>eq.**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Metric tons CH4 reduced in CO<sub>2</sub>eq**Allowed values:** 0-10,000,000**Logic:** None – all respond**Required:** If a project conducts soil samples or takes carbon stock or greenhouse gas emission measurements in this field**Data collection level:** Field**Data collection frequency:** Annual

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**Total N2O reduction calculated**
**Data element name:** Total N2O reduction calculated**Reporting question:** What are the total measured N2O emission reductions?**Description:** Total annual nitrous oxide emission reductions based on practice implementation in the field calculated from in-field measurements. Conversion rate is one ton of N<sub>2</sub>O = 298 tons of CO<sub>2</sub>eq.**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Metric tons N2O reduced in CO<sub>2</sub>eq**Allowed values:** 0-10,000,000**Logic:** None – all respond**Required:** If a project conducts soil samples or takes carbon stock or greenhouse gas emission measurements in this field**Data collection level:** Field**Data collection frequency:** Annual

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**Soil sample result**
**Data element name:** Soil sample result**Reporting question:** What is the numeric result from this soil sample?**Description:** Results of measurement(s) taken to determine the carbon stock of a soil (the tons of carbon found in a specified volume of soil).**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Amount**Allowed values:** .00001-100,000**Logic:** None – all respond**Required:** If a project conducts soil samples in this field**Data collection level:** Field**Data collection frequency:** Annual




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**Soil sample result unit**

**Data element name:** Soil sample result unit      **Reporting question:** What is unit for the soil sample result?

**Description:** Unit for the corresponding soil sample result. The worksheet provides a drop-down list of choices for this data element. If “other” is chosen, use the additional column to enter the appropriate yield unit as free text.

**Data type:** List

**Select multiple values:** No

**Measurement unit:** Category

**Allowed values:**

- Percent
- Ppm
- Grams
- Grams per cubic centimeter
- Other (specify)

**Logic:** None – all respond

**Required:** If a project conducts soil samples in this field

**Data collection level:** Field

**Data collection frequency:** Annual

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**Measurement type**

**Data element name:** Measurement type

**Reporting question:** What type of analysis was conducted for this soil sample?

**Description:** Type of soil analysis conducted. The worksheet provides a drop-down list of choices for this data element. If “other” is chosen, use the additional column to enter the appropriate yield unit as free text.

**Data type:** List

**Select multiple values:** No

**Measurement unit:** Category

**Allowed values:**

- Organic matter
- Total organic carbon
- Bulk density
- Other (specify)

**Logic:** None – all respond

**Required:** If a project conducts soil samples in this field

**Data collection level:** Field

**Data collection frequency:** Annual

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## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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Additional Environmental Benefits**Unique IDs**

Farm ID	Unique Farm ID assigned by FSA
Tract ID	Unique Tract ID assigned by FSA
Field ID	Unique Field ID assigned by FSA
State or territory of field	State name (must match FSA farm enrollment data)
County of field	County name (must match FSA farm enrollment data)

**Environmental benefits**

<b>Data element name:</b> Environmental benefits	<b>Reporting question:</b> Are environmental benefits other than GHGs being tracked in the field?
<b>Description:</b> Tracking of environmental benefits other than greenhouse gas emission reductions and carbon sequestration in the enrolled field. Tracking means at a minimum using some form of monitoring and reporting that can quantify benefits.	
<b>Data type:</b> List	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Category	<b>Allowed values:</b> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• I don't know</li> </ul>
<b>Logic:</b> None – all respond	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Annual

**Reduction in nitrogen loss**

<b>Data element name:</b> Reduction in nitrogen loss	<b>Reporting question:</b> Are reductions in nitrogen losses being tracked in the field?
<b>Description:</b> Tracking reductions in nitrogen losses in the enrolled field. Tracking means at a minimum using some form of monitoring and reporting that can quantify benefits.	
<b>Data type:</b> List	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Category	<b>Allowed values:</b> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• I don't know</li> </ul>
<b>Logic:</b> Respond if yes to 'Environmental benefits'	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Annual

**Reduction in nitrogen loss amount**

<b>Data element name:</b> Reduction in nitrogen loss amount	<b>Reporting question:</b> How much reduction in nitrogen losses have been measured in the field?
<b>Description:</b> Total amount of reduction in nitrogen losses that is measured and reported in the enrolled field.	
<b>Data type:</b> Decimal	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Amount	<b>Allowed values:</b> 0-1,000,000
<b>Logic:</b> Respond if yes to 'Reduction in nitrogen loss'	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Annual



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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**Reduction in nitrogen loss amount unit**

**Data element name:** Reduction in nitrogen loss amount unit      **Reporting question:** What is the unit for how much reduction in nitrogen losses have been measured in the field?

**Description:** Unit for the total amount of reduction in nitrogen losses that is measured and reported in the enrolled field. If "other" is chosen, enter the appropriate value as free text in the additional column.

**Data type:** List

**Select multiple values:** No

**Measurement unit:** Category

**Allowed values:**

- Kilograms
- Metric tons
- Pounds
- Other (specify)

**Logic:** Respond if yes to 'Reduction in nitrogen loss'

**Required:** Yes

**Data collection level:** Field

**Data collection frequency:** Annual

**Reduction in nitrogen loss purpose**

**Data element name:** Reduction in nitrogen loss purpose      **Reporting question:** What is the purpose of tracking reduction in nitrogen losses?

**Description:** Purpose of tracking reduction in nitrogen losses in the enrolled field. If "other" is chosen, enter the appropriate value as free text in the additional column.

**Data type:** List

**Select multiple values:** No

**Measurement unit:** Category

**Allowed values:**

- Commodity marketing
- Producing insets
- Producing offsets
- I don't know
- Other (specify)

**Logic:** Respond if yes to 'Reduction in nitrogen loss'

**Required:** Yes

**Data collection level:** Project

**Data collection frequency:** Annual

**Reduction in phosphorus loss**

**Data element name:** Reduction in phosphorus loss      **Reporting question:** Are reductions in phosphorus losses being tracked in the field?

**Description:** Tracking of reductions in phosphorus losses in the enrolled field. Tracking means at a minimum using some form of monitoring and reporting that can quantify benefits.

**Data type:** List

**Select multiple values:** No

**Measurement unit:** Category

**Allowed values:**

- Yes
- No
- I don't know

**Logic:** Respond if yes to 'Environmental benefits'

**Required:** Yes

**Data collection level:** Field

**Data collection frequency:** Annual

**Reduction in phosphorus loss amount**

**Data element name:** Reduction in phosphorus loss amount      **Reporting question:** How much reduction in phosphorus losses have been measured in the field?

**Description:** Total amount of reduction in phosphorus losses that is measured in the field.

**Data type:** Decimal

**Select multiple values:** No

**Measurement unit:** Amount

**Allowed values:** 0-1,000,000

**Logic:** Respond if yes to 'Reduction in phosphorus loss'

**Required:** Yes

**Data collection level:** Field

**Data collection frequency:** Annual



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**Reduction in phosphorus loss amount unit****Data element name:** Reduction in phosphorus loss amount unit**Reporting question:** What is the unit for the reduction in phosphorus losses measured in the field?**Description:** Unit for the total amount of reduction in phosphorus losses that is measured in the enrolled field. If "other" is chosen, enter the appropriate value as free text in the additional column.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Kilograms
- Metric tons
- Pounds
- Other (specify)

**Logic:** Respond if yes to 'Reduction in phosphorus loss'**Required:** Yes**Data collection level:** Field**Data collection frequency:** Annual**Reduction in phosphorus loss purpose****Data element name:** Reduction in phosphorus loss purpose**Reporting question:** What is the purpose of tracking reductions in phosphorus losses?**Description:** Purpose of tracking reduction in phosphorus losses in the enrolled field. If "other" is chosen, enter the appropriate value as free text in the additional column.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Commodity marketing
- Producing insets
- Producing offsets
- I don't know
- Other (specify)

**Logic:** Respond if yes to 'Reduction in phosphorus loss'**Required:** Yes**Data collection level:** Field**Data collection frequency:** Annual**Other water quality****Data element name:** Other water quality**Reporting question:** Are other water quality metrics being tracked in the field?**Description:** Project tracking of other water quality metrics in the enrolled field. Tracking means at a minimum using some form of monitoring and reporting that can quantify benefits.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Yes
- No
- I don't know

**Logic:** Respond if yes to 'Environmental benefits'**Required:** Yes**Data collection level:** Field**Data collection frequency:** Annual



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

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**Other water quality type**

<b>Data element name:</b> Other water quality type	<b>Reporting question:</b> What type of other water quality metric have been measured in the field?
<b>Description:</b> Type of other water quality metric (besides nitrogen loss and phosphorus loss reductions) that is measured in the field. If "other" is chosen, enter the appropriate value as free text in the additional column.	
<b>Data type:</b> List	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Category	<b>Allowed values:</b> <ul style="list-style-type: none"> <li>• Sediment load reduction</li> <li>• Temperature</li> <li>• Other (specify)</li> </ul>
<b>Logic:</b> Respond if yes to 'Other water quality'	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Annual

**Other water quality amount**

<b>Data element name:</b> Other water quality amount	<b>Reporting question:</b> How much reduction in other water quality metrics have been measured in the field?
<b>Description:</b> Total amount of reduction in other water quality metrics that is measured in the enrolled field.	
<b>Data type:</b> Decimal	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Amount	<b>Allowed values:</b> 0-1,000,000
<b>Logic:</b> Respond if yes to 'Other water quality'	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Annual

**Other water quality amount unit**

<b>Data element name:</b> Other water quality amount unit	<b>Reporting question:</b> What is the unit for the reduction in other water quality metrics measured in the field?
<b>Description:</b> Unit for the total amount of reduction in other water quality metrics that is measured in the enrolled field. If "other" is chosen, enter the appropriate value as free text in the additional column.	
<b>Data type:</b> List	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Category	<b>Allowed values:</b> <ul style="list-style-type: none"> <li>• Degrees F</li> <li>• Kilograms</li> <li>• Kilograms per liter</li> <li>• Metric tons</li> <li>• Pounds</li> <li>• Other (specify)</li> </ul>
<b>Logic:</b> Respond if yes to 'Other water quality'	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Annual





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**Other water quality purpose**

<b>Data element name:</b> Other water quality purpose	<b>Reporting question:</b> What is the purpose of tracking other water quality benefits?
<b>Description:</b> Purpose of tracking other water quality benefits in the enrolled field. If "other" is chosen, enter the appropriate value as free text in the additional column.	
<b>Data type:</b> List	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Category	<b>Allowed values:</b>
	<ul style="list-style-type: none"> <li>• Commodity marketing</li> <li>• Producing insets</li> <li>• Producing offsets</li> <li>• I don't know</li> <li>• Other (specify)</li> </ul>
<b>Logic:</b> Respond if yes to 'Other water quality'	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Annual

**Water quantity**

<b>Data element name:</b> Water quantity	<b>Reporting question:</b> Is water conservation being tracked in the field?
<b>Description:</b> Tracking of water conservation or reduction in use in the enrolled field. Tracking means at a minimum using some form of monitoring and reporting that can quantify benefits.	
<b>Data type:</b> List	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Category	<b>Allowed values:</b>
	<ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• I don't know</li> </ul>
<b>Logic:</b> Respond if yes to 'Environmental benefits'	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Annual

**Water quantity amount**

<b>Data element name:</b> Water quantity amount	<b>Reporting question:</b> How much water conservation has been measured in the field?
<b>Description:</b> Total amount of water conservation or reduction that is measured in the field.	
<b>Data type:</b> Decimal	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Amount	<b>Allowed values:</b> 0-1,000,000
<b>Logic:</b> Respond if yes to 'Water quantity'	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Annual

**Water quantity amount unit**

<b>Data element name:</b> Water quantity amount unit	<b>Reporting question:</b> What is the unit for the amount of water conservation measured in the field?
<b>Description:</b> Unit for the total amount of water conservation or reduced use that is measured and reported in the enrolled field. If "other" is chosen, enter the appropriate value as free text in the additional column.	
<b>Data type:</b> List	<b>Select multiple values:</b> No
<b>Measurement unit:</b> Category	<b>Allowed values:</b>
	<ul style="list-style-type: none"> <li>• Acre-feet</li> <li>• Cubic feet</li> <li>• Other (specify)</li> </ul>
<b>Logic:</b> Respond if yes to 'Water quantity'	<b>Required:</b> Yes
<b>Data collection level:</b> Field	<b>Data collection frequency:</b> Annual



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**Water quantity purpose****Data element name:** Water quantity purpose**Reporting question:** What is the purpose of tracking water conservation?**Description:** Purpose of tracking water conservation or reductions in water use in the enrolled field. If "other" is chosen, enter the appropriate value as free text in the additional column.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Commodity marketing
- Producing insets
- Producing offsets
- I don't know
- Other (specify)

**Logic:** Respond if yes to 'Water quantity'**Required:** Yes**Data collection level:** Field**Data collection frequency:** Annual**Reduced erosion****Data element name:** Reduced erosion**Reporting question:** Is reduced soil erosion being tracked in the field?**Description:** Tracking of reduced soil erosion in the enrolled field. Tracking means at a minimum using some form of monitoring and reporting that can quantify benefits.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Yes
- No
- I don't know

**Logic:** Respond if yes to 'Environmental benefits'**Required:** Yes**Data collection level:** Field**Data collection frequency:** Annual**Reduced erosion amount****Data element name:** Reduced erosion amount**Reporting question:** How much erosion reduction has been measured in the field?**Description:** Total amount of erosion reduction that is measured in the enrolled field.**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Amount**Allowed values:** 0-1,000,000**Logic:** Respond if yes to 'Reduced erosion'**Required:** Yes**Data collection level:** Field**Data collection frequency:** Annual**Reduced erosion amount unit****Data element name:** Reduced erosion unit**Reporting question:** What is the unit for the amount of erosion reduction measured?**Description:** Unit for the total amount of erosion reduction from enrolled fields that is measured and reported by the project. If "other" is chosen, enter the appropriate value as free text in the additional column.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Tons
- Other (specify)

**Logic:** Respond if yes to 'Reduced erosion'**Required:** Yes**Data collection level:** Field**Data collection frequency:** Annual



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**Reduced erosion purpose****Data element name:** Reduced erosion purpose**Description:** Purpose of tracking reduced erosion the enrolled field. If "other" is chosen, enter the appropriate value as free text in the additional column.**Data type:** List**Measurement unit:** Category**Reporting question:** What is the purpose of tracking reduced erosion in the field?**Select multiple values:** No**Allowed values:**

- Commodity marketing
- Producing insets
- Producing offsets
- I don't know
- Other (specify)

**Logic:** Respond if yes to 'Reduced erosion'**Required:** Yes**Data collection level:** Field**Data collection frequency:** Annual**Reduced energy use****Data element name:** Reduced energy use**Reporting question:** Is reduced energy use being tracked in the field?**Description:** Tracking of reduced energy use in the enrolled field. Tracking means at a minimum using some form of monitoring and reporting that can quantify benefits.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Yes
- No
- I don't know

**Logic:** Respond if yes to 'Environmental benefits'**Required:** Yes**Data collection level:** Field**Data collection frequency:** Annual**Reduced energy use amount****Data element name:** Reduced energy use amount**Reporting question:** How much energy use reduction has been measured in the field?**Description:** Total amount of energy use reduction that is measured in the enrolled field.**Data type:** Decimal**Select multiple values:** No**Measurement unit:** Amount**Allowed values:** 0-1,000,000**Logic:** Respond if yes to 'Reduced energy use'**Required:** Yes**Data collection level:** Field**Data collection frequency:** Annual**Reduced energy use amount unit****Data element name:** Reduced energy use unit**Reporting question:** What is the unit for the energy use reduction measured in the field?**Description:** Unit for the total amount of energy use reduction that is measured in the enrolled field. If "other" is chosen, enter the appropriate value as free text in the additional column.**Data type:** List**Select multiple values:** No**Measurement unit:** Category**Allowed values:**

- Kilowatt hours
- Other (specify)

**Logic:** Respond if yes to 'Reduced energy use'**Required:** Yes**Data collection level:** Field**Data collection frequency:** Annual



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**Reduced energy use purpose****Data element name:** Reduced energy use purpose**Description:** Purpose of tracking reduced energy use in the enrolled field. If "other" is chosen, enter the appropriate value as free text in the additional column.**Data type:** List**Measurement unit:** Category**Logic:** Respond if yes to 'Reduced energy use'**Data collection level:** Field**Reporting question:** What is the purpose of tracking reduced energy use in the field?**Select multiple values:** No**Allowed values:**

- Commodity marketing
- Producing insets
- Producing offsets
- I don't know
- Other (specify)

**Required:** Yes**Data collection frequency:** Annual**Avoided land conversion****Data element name:** Avoided land conversion**Description:** Tracking of avoided land conversion in the enrolled field. Tracking means at a minimum using some form of monitoring and reporting that can quantify benefits. Land conservation means land use changing from agricultural uses to non-agricultural uses.**Data type:** List**Measurement unit:** Category**Logic:** Respond if yes to 'Environmental benefits'**Data collection level:** Field**Reporting question:** Is avoided land conversion being tracked in the field?**Select multiple values:** No**Allowed values:**

- Yes
- No
- I don't know

**Required:** Yes**Data collection frequency:** Annual**Avoided land conversion amount****Data element name:** Avoided land conversion amount**Description:** Total amount of avoided land conversion that is measured in the enrolled field.**Data type:** Decimal**Measurement unit:** Amount**Logic:** Respond if yes to 'Avoided land conversion'**Data collection level:** Field**Reporting question:** How much avoided land conversion has been measured in the field?**Select multiple values:** No**Allowed values:** 0-1,000,000**Required:** Yes**Data collection frequency:** Annual**Avoided land conversion amount unit****Data element name:** Avoided land conversion unit**Description:** Unit for the total amount of avoided land conversion that is measured in the enrolled field. If "other" is chosen, enter the appropriate value as free text in the additional column.**Data type:** List**Measurement unit:** Category**Logic:** Respond if yes to 'Avoided land conversion'**Data collection level:** Field**Reporting question:** What is the unit for the amount of avoided land conversion measured in the field?**Select multiple values:** No**Allowed values:**

- Acres
- Other (specify)

**Required:** Yes**Data collection frequency:** Annual



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**Avoided land conversion purpose****Data element name:** Avoided land conversion purpose**Description:** Purpose of tracking avoided land conversion in the enrolled field. If “other” is chosen, enter the appropriate value as free text in the additional column.**Data type:** List**Measurement unit:** Category**Logic:** Respond if yes to ‘Avoided land conversion’**Data collection level:** Field**Reporting question:** What is the purpose of tracking avoided land conversion in the field?**Select multiple values:** No**Allowed values:**

- Commodity marketing
- Producing insets
- Producing offsets
- I don’t know
- Other (specify)

**Required:** Yes**Data collection frequency:** Annual**Improved wildlife habitat****Data element name:** Improved wildlife habitat**Description:** Tracking of improvements to wildlife in and around the enrolled field. Tracking means at a minimum using some form of monitoring and reporting that can quantify benefits.**Data type:** List**Measurement unit:** Category**Logic:** Respond if yes to ‘Environmental benefits’**Data collection level:** Field**Reporting question:** Are improvements to wildlife habitat being tracked in the field?**Select multiple values:** No**Allowed values:**

- Yes
- No
- I don’t know

**Required:** Yes**Data collection frequency:** Annual**Improved wildlife habitat amount****Data element name:** Improved wildlife habitat amount**Description:** Total amount of improved wildlife habitat that is measured in and around the enrolled fields.**Data type:** Decimal**Measurement unit:** Amount**Logic:** Respond if yes to ‘Improved wildlife habitat’**Data collection level:** Field**Reporting question:** How much improved wildlife habitat has been measured in the field?**Select multiple values:** No**Allowed values:** 0-1,000,000**Required:** Yes**Data collection frequency:** Annual**Improved wildlife habitat amount unit****Data element name:** Improved wildlife habitat unit**Description:** Unit for the total amount of improved wildlife habitat that is measured in and around enrolled fields. If “other” is chosen, enter the appropriate value as free text in the additional column.**Data type:** List**Measurement unit:** Category**Logic:** Respond if yes to ‘Improved wildlife habitat’**Data collection level:** Field**Reporting question:** What is the unit for the amount of improved wildlife habitat measured in the field?**Select multiple values:** No**Allowed values:**

- Acres
- Linear feet
- Other (specify)

**Required:** Yes**Data collection frequency:** Annual



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**Improved wildlife habitat purpose**

**Data element name:** Improved wildlife habitat purpose

**Description:** Purpose of tracking improved wildlife habitat in the enrolled field. If “other” is chosen, enter the appropriate value as free text in the additional column.

**Data type:** List

**Measurement unit:** Category

**Logic:** Respond if yes to ‘Improved wildlife habitat’

**Data collection level:** Field

**Reporting question:** What is the purpose of tracking improved wildlife habitat in the field?

**Select multiple values:** No


**Allowed values:**

- Commodity marketing
- Producing insets
- Producing offsets
- I don’t know
- Other (specify)

**Required:** Yes

**Data collection frequency:** Annual


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**CSAF Practice Sub-questions**

For some CSAF practices, there is an additional set of questions that are unique to each practice. Responses to these questions are needed to verify estimated GHG benefits of these practices. If a field is implementing a CSAF practice with an NRCS CPS code in Table 11, answer the follow-up questions listed next to the relevant practice name in the table. Use the *Supplemental Reporting Workbook – CSAF Practice Sub-questions* to report the required information.


Table 11. Follow-on questions for select CSAF practices

Practice name and code	Follow-up question	Options (select one)
Alley Cropping (CPS 311)	Species category (select most common/extensive type if using more than one)	Coniferous trees Deciduous trees Shrubs
	Species density (number of trees planted per acre)	1-10,000
Anaerobic Digester (CPS 366)	Waste storage system prior to installing anaerobic digester	Aerobic lagoon
		Anaerobic digester (complex mix) with energy generation
		Anaerobic digester (plug flow) with energy generation
		Anaerobic lagoon
		Composting
		Covered lagoon (no energy generation or flaring)
		Covered lagoon with energy generation
		Covered lagoon with flaring
		Daily spread
		Deep bedding pack
Digester type	Digester type	Deep pit
		Dry lot
		Dry stacking/solid storage
		Pasture/range/paddock
		Poultry with bedding
		Poultry without bedding (e.g., high rise)
		Slurry tank/basin
		Covered lagoon with energy generation
		Covered lagoon with flaring
		Covered lagoon (no energy generation or flaring)
Additional feedstock source (select most common if using more than one)	Additional feedstock source (select most common if using more than one)	Complex mix with energy generation
		Plug flow with energy generation
		Other (specify)
		Food waste
		Straw or bedding
		Wastewater
		Other (specify)



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Combustion System Improvement (CPS 372)	Fuel type before installation	Coal Diesel Electricity Gasoline Kerosene Liquified petroleum gas (LPG) Natural gas Propane Wood Other (specify)
	Fuel amount before installation	0-1,000,000
	Fuel amount unit before installation	Cubic feet (natural gas) Gallons (diesel, gasoline, propane, LPG, kerosene) Kilowatt-hours (electricity) Pounds (wood, coal) Other (specify)
	Fuel type after installation	Coal Diesel Electricity Gasoline Kerosene Liquified petroleum gas (LPG) Natural gas Propane Wood Other (specify)
	Fuel amount after installation	0-1,000,000
	Fuel amount unit after installation	Cubic feet (natural gas) Gallons (diesel, gasoline, propane, LPG, kerosene) Kilowatt-hours (electricity) Pounds (wood, coal) Other (specify)
Conservation Cover (CPS 327)	Species category (select most common/extensive type if using more than one)	Brassicas Grasses Legumes Non-legume broadleaves Shrubs




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Conservation Crop Rotation (CPS 328)	Conservation crop type	Brassica Broadleaf Cool season Grass Legume Warm season
	Change implemented	Added perennial crop Reduced fallow period Both
	Conservation crop rotation tillage type	Conventional (plow, chisel, disk) No-till, direct seed Reduced till Strip till None Other (specify)
	Total conservation crop rotation length in days	1-120
Contour Buffer Strips (CPS 332)	Strip width (feet)	1-100
	Species category	Grasses Forbs Mix
Cover Crop (CPS 340)	Species category (select most common/extensive type if using more than one)	Brassicas Forbs Grasses Legume Non-legume broadleaves
	Cover crop planned management	Grazing Haying Termination
	Cover crop termination method	Burning Herbicide application Incorporation Mowing Rolling/crimping Winter kill/frost
	Species category (select most common/extensive type if using more than one)	Grass Grass legume/forb mix Herbaceous woody mix Perennial or reseeding Shrubs Trees
Feed Management (CPS 592)	Crude protein (percent)	0-100
	Fat (percent)	0-100
	Feed additives/supplements	Chemical Edible oils/fats Seaweed/kelp Other (specify)
Field Border (CPS 386)	Species category (select most common/extensive type if using more than one)	Forbs Grasses Mix Shrubs


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	Strip width (feet)	20-1,000
Filter Strip (CPS 393)	Species category (select most common/extensive type if using more than one)	Forbs Grasses Mix Shrubs
Forest Farming (CPS 379)	Land use in previous year	Forest Multi-story cropping Pasture/grazing land Row crops Other agroforestry
Forest Stand Improvement (CPS 666)	Purpose for implementation	Maintain or improve forest carbon stocks Maintain or improve forest health and productivity Maintain or improve forest structure and composition Maintain or improve wildlife, fish, and pollinator habitat Manage natural precipitation more efficiently Reduce forest pest pressure Reduce forest wildfire hazard
Grassed Waterway (CPS 412)	Species category (select most common/extensive type if using more than one)	Flowering Plants Forbs Grasses
Hedgerow Planting (CPS 422)	Species category (select most common/extensive type if using more than one)	Grasses Shrubs Trees
	Species density (number of trees planted per acre)	1-10,000
Herbaceous Wind Barriers (CPS 603)	Species category (select most common/extensive type if using more than one)	Forbs Grasses Mix Shrubs
	Barrier width (feet)	1-1,000
	Number of rows	1-100
Mulching (CPS 484)	Mulch type	Gravel Natural Synthetic Wood
	Mulch cover (percent of field)	0-100




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	Nutrient type with CPS 590	Biosolids Commercial fertilizers Compost EEF (nitrification inhibitor) EEF (slow or controlled release) EEF (urease inhibitor) Green manure Liquid animal manure Organic by-products Organic residues or materials Solid/semi-solid animal manure Wastewater
	Nutrient application method with CPS 590	Banded Broadcast Injection Irrigation Surface application Surface application with tillage Variable rate
Nutrient management (CPS 590)	Nutrient application method in the previous year	Banded Broadcast Injection Irrigation Surface application Surface application with tillage Variable rate
	Nutrient application timing with CPS 590	Single pre-planting Single post-planting Split pre- and post-planting Split post-planting
	Nutrient application timing in the previous year	Single pre-planting Single post-planting Split pre- and post-planting Split post-planting
	Nutrient application rate with CPS 590	0-20,000
	Nutrient application rate unit with CPS 590	Gallons per acre Pounds per acre
	Nutrient application rate change	Decrease compared to previous year Increase compared to previous year No change
Pasture and Hay Planting (CPS 512)	Species category (select most common/extensive type if using more than one)	Cool-season broadleaf Cool-season grass Warm-season broadleaf Warm-season grass
	Termination process	Grazing Haying (i.e., cutting and baling) Other (specify)
Prescribed Grazing (CPS 528)	Grazing type	Cell grazing Deferred rotational Management intensive Rest-rotation


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Range Planting (CPS 550)	Species category (select most common/extensive type if using more than one)	Forbs Grasses Legumes Shrubs Trees
Residue and Tillage Management – No-till (CPS 329)	Surface disturbance	None Seed row only
Residue and Tillage Management – Reduced Till (CPS 345)	Surface disturbance	None Seed row/ridge tillage for planting Shallow across most of the soil surface Vertical/mulch
Riparian Forest Buffer (CPS 391)	Species category (select most common/extensive type if using more than one)	Coniferous trees Deciduous trees Shrubs
	Species density (number of trees planted per acre)	1-10,000
Riparian Herbaceous Cover (CPS 390)	Species category (select most common/extensive type if using more than one)	Ferns Forbs Grasses Legumes Rushes Sedges
Roofs and Covers (CPS 367)	Roof/cover type	Concrete Flexible geomembrane Metal Timber Other (specify)
Silvopasture (CPS 381)	Species category (select most common/extensive type if using more than one)	Coniferous trees Deciduous trees Forage Shrubs
	Species density (number of trees planted per acre)	1-10,000
Stripcropping (CPS 585)	Strip width (feet)	1-1,000
	Crop category (select most common/extensive type if using more than one)	Erosion resistant crops Fallow Sediment trapping crops
	Number of strips	2-100
Tree/Shrub Establishment (CPS 612)	Species category (select most common/extensive type if using more than one)	Coniferous trees Deciduous trees Shrubs
	Species density (number of trees planted per acre)	1-10,000
Vegetative Barrier (CPS 601)	Species category (select most common/extensive type if using more than one)	Grasses Grass forb mix Grass legume mix
	Barrier width (feet)	3-1,000


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Waste Separation Facility (CPS 632)	Separation type	Chemical (e.g., salts, polymers) Mechanical (e.g., screens, presses) Settling basin
	Most common use of solids	Bedding Field applied Other (specify)
Waste Storage Facility (CPS 313)	Waste storage system prior to installing your waste storage facility	Aerobic lagoon Anaerobic digester (complex mix) with energy generation Anaerobic digester (plug flow) with energy generation Anaerobic lagoon Composting Covered lagoon (no energy generation or flaring) Covered lagoon with energy generation Covered lagoon with flaring Daily spread Deep bedding pack Deep pit Dry lot Dry stacking/solid storage Pasture/range/paddock Poultry with bedding Poultry without bedding (e.g., high rise) Slurry tank/basin
Waste Treatment (CPS 629)	Treatment type	Biological Chemical Mechanical
Waste Treatment Lagoon (CPS 359)	Waste storage system prior to installing waste treatment lagoon	Aerobic lagoon Anaerobic digester (complex mix) with energy generation Anaerobic digester (plug flow) with energy generation Anaerobic lagoon Composting Covered lagoon (no energy generation or flaring) Covered lagoon with energy generation Covered lagoon with flaring Daily spread Deep bedding pack Deep pit Dry lot Dry stacking/solid storage Pasture/Range/Paddock Poultry with bedding Poultry without bedding (e.g., high rise) Slurry tank/basin
	Is there a lagoon cover/crust?	Yes No
	Is there lagoon aeration?	Yes No

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Windbreak/Shelterbelt Establishment and Renovation (CPS 380)	Species category (select most common/extensive type if using more than one)	Coniferous trees Deciduous trees Shrubs
	Species density (number of trees planted per acre)	1-10,000



## Appendix A: Climate-smart Agriculture and Forestry Practices

### All NRCS Practice Standards (not limited to climate-smart practices)

309, Agrichemical Handling Facility	390, Riparian Herbaceous Cover
311, Alley Cropping	391, Riparian Forest Buffer
313, Waste Storage Facility	393, Filter Strip
314, Brush Management	394, Firebreak
315, Herbaceous Weed Treatment	395, Stream Habitat Improvement and Management
316, Animal Mortality Facility	396, Aquatic Organism Passage
317, Composting Facility	397, Aquaculture Pond
318, Short Term Storage of Animal Waste and By-Products	398, Fish Raceway or Tank
319, On-Farm Secondary Containment Facility	399, Fishpond Management
320, Irrigation Canal or Lateral	400, Bivalve Aquaculture Gear and Biofouling Control
324, Deep Tillage	402, Dam
325, High Tunnel System	410, Grade Stabilization Structure
326, Clearing and Snagging	412, Grassed Waterway
327, Conservation Cover	420, Wildlife Habitat Planting
328, Conservation Crop Rotation	422, Hedgerow Planting
329, Residue and Tillage Management, No Till	423, Hillside Ditch
330, Contour Farming	428, Irrigation Ditch Lining
331, Contour Orchard and Other Perennial Crops	428A, Irrigation Water Conveyance, Ditch and Canal Lining, Plain Concrete
332, Contour Buffer Strips	428B, Irrigation Water Conveyance, Ditch and Canal Lining, Flexible Membrane
333, Amending Soil Properties with Gypsum Products	428C, Irrigation Water Conveyance, Ditch and Canal Lining, Galvanized Steel
334, Controlled Traffic Farming	430, Irrigation Pipeline
336, Soil Carbon Amendment	432, Dry Hydrant
338, Prescribed Burning	436, Irrigation Reservoir
340, Cover Crop	441, Irrigation System, Microirrigation
342, Critical Area Planting	442, Sprinkler System
345, Residue and Tillage Management, Reduced Till	443, Irrigation System, Surface and Subsurface
348, Dam, Diversion	447, Irrigation and Drainage Tailwater Recovery
350, Sediment Basin	449, Irrigation Water Management
351, Well Decommissioning	450, Anionic Polyacrylamide (PAM) Application
353, Monitoring Well	453, Land Reclamation, Landslide Treatment
355, Groundwater Testing	455, Land Reclamation, Toxic Discharge Control
356, Dike and Levee	457, Mine Shaft and Adit Closing
359, Waste Treatment Lagoon	460, Land Clearing
360, Waste Facility Closure	462, Precision Land Forming and Smoothing
362, Diversion	464, Irrigation Land Leveling
366, Anaerobic Digester	466, Land Smoothing
367, Roofs and Covers	468, Lined Waterway or Outlet
368, Emergency Animal Mortality Management	472, Access Control
371, Air Filtration and Scrubbing	484, Mulching
372, Combustion System Improvement	490, Tree/Shrub Site Preparation
373, Dust Control on Unpaved Roads and Surfaces	500, Obstruction Removal
374, Energy Efficient Agricultural Operation	511, Forage Harvest Management
375, Dust Management for Pen Surfaces	512, Pasture and Hay Planting
376, Field Operations Emissions Reduction	516, Livestock Pipeline
378, Pond	520, Pond Sealing or Lining, Compacted Soil Treatment
379, Forest Farming	521, Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner
380, Windbreak/Shelterbelt Establishment and Renovation	521A, Pond Sealing or Lining, Flexible Membrane
381, Silvopasture	521B, Pond Sealing or Lining, Soil Dispersant
382, Fence	521C, Pond Sealing or Lining, Bentonite Sealant
383, Fuel Break	
384, Woody Residue Treatment	
386, Field Border	
388, Irrigation Field Ditch	



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521D, Pond Sealing or Lining, Compacted Clay Treatment	632, Waste Separation Facility
522, Pond Sealing or Lining - Concrete	633, Waste Recycling
527, Sinkhole Treatment	634, Waste Transfer
528, Prescribed Grazing	635, Vegetated Treatment Area
533, Pumping Plant	636, Water Harvesting Catchment
543, Land Reclamation, Abandoned Mined Land	638, Water and Sediment Control Basin
544, Land Reclamation, Currently Mined Land	640, Waterspreading
548, Grazing Land Mechanical Treatment	642, Water Well
550, Range Planting	643, Restoration of Rare or Declining Natural Communities
554, Drainage Water Management	644, Wetland Wildlife Habitat Management
555, Rock Wall Terrace	645, Upland Wildlife Habitat Management
557, Row Arrangement	646, Shallow Water Development and Management
558, Roof Runoff Structure	647, Early Successional Habitat Development-Mgt
560, Access Road	649, Structures for Wildlife
561, Heavy Use Area Protection	650, Windbreak/Shelterbelt Renovation
562, Recreation Area Improvement	654, Road/Trail/Landing Closure and Treatment
566, Recreation Land Improvement and Protection	655, Forest Trails and Landings
570, Stormwater Runoff Control	656, Constructed Wetland
572, Spoil Disposal	657, Wetland Restoration
574, Spring Development	658, Wetland Creation
575, Trails and Walkways	659, Wetland Enhancement
576, Livestock Shelter Structure	660, Tree-Shrub Pruning
578, Stream Crossing	666, Forest Stand Improvement
580, Streambank and Shoreline Protection	670, Energy Efficient Lighting System
582, Open Channel	672, Energy Efficient Building Envelope
584, Channel Bed Stabilization	736, Crop By-Product Transfer, interim
585, Stripcropping	724, Water Treatment Facility, interim
587, Structure for Water Control	735, Waste Gasification Facility, interim
588, Crosswind Ridges	737, Reduced Water and Energy Coffee Conveyance System, interim
589, Cross Wind Trap Strips	740, Pond Sealing and Lining, Soil Cement, interim
590, Nutrient Management	751, Individual Terrace, interim
591, Amendments for Treatment of Agricultural Waste	753, Infiltration Ditch, interim
592, Feed Management	755, Well Plugging, interim
595, Pest Management Conservation System	770, Livestock Confinement Facility, interim
600, Terrace	775, Drainage Ditch Covering, interim
601, Vegetative Barrier	782, Phosphorus Removal System, interim
602, Equitable Relief	800, Controlling Existing Flowing Wells, interim
603, Herbaceous Wind Barriers	803, Water Well Disinfection, interim
604, Saturated Buffer	805, Amending Soil Properties with Lime, interim
605, Denitrifying Bioreactor	808, Soil Carbon Amendment, interim
606, Subsurface Drain	809, Conservation Harvest Management, interim
607, Surface Drain, Field Ditch	810, Annual Forages for Grazing Systems, interim
608, Surface Drain, Main or Lateral	812, Raised Beds, interim
609, Surface Roughening	815, Groundwater Recharge Basin or Trench, interim
610, Salinity and Sodic Soil Management	817, On-Farm Recharge, interim
612, Tree/Shrub Establishment	818, Water Conservation System, interim
614, Watering Facility	821, Low Tunnel Systems, interim
620, Underground Outlet	823, Organic Management, interim
629, Waste Treatment	
630, Vertical Drain	



 Partnerships for Climate-Smart Commodities Data Dictionary for Recipients  
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Other CSAF Practices

Traditional or cultural practices

Microbial products

Solar power generation

Grain bin construction

Pre-season drainage



## Appendix B: Commodity List

CROPS

ALFALFA	CINNAMON	HYBRID POPLAR TREES
ALMONDS	CLOVER	IDLE
AMARANTH GRAIN	COCONUTS	INDIGO
APPLES	COFFEE	ISRAEL MELONS
APRICOTS	CORN	JACK FRUIT
ARONIA (CHOKEBERRY)	COTTON ELS	JERUSALEM ARTICHOKE
ARTICHOKE	COTTON UPLAND	JICAMA
ASPARAGUS	CRANBERRIES	JOJOBA
ATEMOYA	CRENSHAW MELON	JUJUBE
AVOCADOS	CRUSTACEAN	JUNE BERRIES
BAMBOO SHOOTS	CUCUMBERS	KENAF
BANANAS	CURRENTS	KHORASAN
BARLEY	DASHEEN	KIWIBERRY
BEANS	DATES	KIWIFRUIT
BEETS	DURIAN	KOCHIA (PROSTRATA)
BIRDSFOOT/TREFOIL	EGGPLANT	KOHLRABI
BLUEBERRIES	EINKORN	KOREAN GOLDEN MELON
BREADFRUIT	ELDERBERRIES	KUMQUATS
BROCCOFLOWER	EMMER	LAMBS EAR
BROCCOLI	FIGS	LEEK
BROCCOLINI	FINFISH	LEMONS
BRUSSEL SPROUTS	FLAX	LENTILS
BUCKWHEAT	FLOWERS	LESPEDEZA
CABBAGE	FORAGE SOYBEAN/SORGHUM	LETTUCE
CACAO	GAILON	LIMES
CACTUS	GARLIC	LONGAN
CAIMITO	GENIP	LOQUATS
CALABAZA MELON	GINGER	LYCHEE
CALALOO	GINSENG	MANGOSTEEN
CAMELINA	GOOSEBERRIES	MAPLE SAP
CANARY MELON	GOURDS	MAYHAW BERRIES
CANARY SEED	GRAPEFRUIT	MEADOWFOAM
CANE BERRIES	GRAPES	MILKWEED
CANISTEL	GRASS	MILLET
CANOLA	GREENS	MIXED FORAGE
CANTALOUPE	GROUND CHERRY	MOHAIR
CARAMBOLA (STAR FRUIT)	GUAMABANA/SOURSOP	MOLLUSK
CARROTS	GUAR	MORINGA
CASHEW	GUAVA	MULBERRIES
CASSAVA	GUAVABERRY	MUSHROOMS
CAULIFLOWER	GUAYULE	MUSTARD
CELERIAC	HAZEL NUTS	NECTARINES
CELERY	HEMP	NIGER SEED
CHERIMOYA	HERBS	NONI
CHERRIES	HESPERALOE	OATS
CHESTNUTS	HONEY	OKRA
CHICORY/RADICCHIO	HONEY BERRIES	OLIVES
CHINESE BITTER MELON	HONEYDEW	ONIONS
CHRISTMAS TREES	HOPS	ORANGES
CHUFAS	HORSERADISH	PAPAYA
	HUCKLEBERRIES	



## Partnerships for Climate-Smart Commodities Data Dictionary for Recipients

February 2023

PARSNIP	STRAWBERRIES	
PASSION FRUITS	SUGAR BEETS	
PAWPAW	SUGARCANE	<u>LIVESTOCK</u>
PEACHES	SUNFLOWERS	ALPACAS
PEANUTS	SUNN HEMP	BEEF COWS
PEARS	TANGELOS	BEEFALO
PEAS	TANGERINES	BUFFALO OR BISON
PECANS	TANGORS	CHICKENS (BROILERS)
PENNYCRESS	TANGOS	CHICKENS (LAYERS)
PEPPERS	TANNIER	DAIRY COWS
PERENNIAL PEANUTS	TARO	DEER
PERIQUE TOBACCO	TEA	DUCKS
PERSIMMONS	TEFF	ELK
PINE NUTS	TI	EMUS
PINEAPPLE	TOBACCO CIGAR WRAPPER	EQUINE
PISTACHIOS	TOBACCO BURLEY	GEESE
PITAYA/DAGONFRUIT	TOBACCO BURLEY 31V	GOATS
PLANTAIN	TOBACCO CIGAR BINDER	HONEYBEES
PLUMCOTS	TOBACCO CIGAR FILLER	LLAMAS
PLUMS	TOBACCO CIGAR FILLER BINDER	REINDEER
POMEGRANATES	TOBACCO DARK AIR CURED	SHEEP
POTATOES	TOBACCO FIRE CURED	SWINE
POTATOES SWEET	TOBACCO FLUE CURED	TURKEYS
PRUNES	TOBACCO MARYLAND	
PSYLLIUM	TOBACCO VIRGINIA FIRE CURED	
PUMMELO	TOMATILLOS	
PUMPKINS	TOMATOES	
QUINCES	TREES TIMBER	
QUINOA	TRITICALE	
RADISHES	TRUFFLES	
RAISINS	TURNIPS	
RAMBUTAN	VETCH	
RAPESEED	WALNUTS	
RHUBARB	WAMPEE	
RICE	WASABI	
RICE SWEET	WATERMELON	
RICE WILD	WAX JAMBOO FRUIT	
RUTABAGA	WHEAT	
RYE	WILLOW SHRUB	
SAFFLOWER	WINTER MELON	
SAPODILLA	WOLFBERRY/GOJI	
SAPOTE	YAM	
SCALLIONS		
SESAME		
SHALLOTS		
SORGHUM		
SORGHUM DUAL PURPOSE		
SORGHUM FORAGE		
SOYBEANS		
SPELT		
SQUASH		
STAR GOOSEBERRY		

# Partnerships for Climate-Smart Commodities

## Additional Specific Terms and Conditions

### February 2023

#### I. Overarching Statement

The following award terms and conditions are applicable to Partnerships for Climate-Smart Commodities agreements and are in addition to the USDA FPAC General Terms and Conditions. The award recipient must abide by all terms of this grant including, but not limited to, the General Terms and Conditions, the terms in the Funding Opportunity and associated Frequently Asked Questions, and this addendum. The recipient must also deliver on the planned objectives in the project narrative and budget narrative associated with this grant.

#### II. Eligibility and Highly Erodible Lands and Wetlands Compliance

In order to be eligible for an incentive payment as a part of the Partnerships for Climate-Smart Commodities, a producer must:

- Establish Farm Records with the Farm Service Agency (FSA) (have farm, tract, and field numbers in place);
- Complete an AD-2047 (Customer Data Worksheet to facilitate the collection of customer data for Business Partner Record);
- Certify highly erodible land conservation (HEL) and wetland conservation (WC) compliance via Form AD-1026, Highly Erodible Land Conservation (HEL) and Wetland Conservation (WC) Certification; and
- Certify that they are not a foreign person or entity.

Farm, tract, and field numbers are required for the producer, and ultimately the Partnerships for Climate-Smart Commodities recipient, to report climate-smart practice implementation to USDA, as well as to certify and maintain HELC/WC compliance. This will require that some producers who do not already have these numbers, like perennial crop growers or feedlots, establish these records with USDA's FSA. Farm, tract, field numbers, producer name, and Core Customer I.D. (CCID) will be provided by the recipient to the National Program Officer as a part of routine grant reporting. Recipients must ensure that producers receiving financial assistance or incentives through this project use the same name as is included in the relevant FSA Business File for that Farm ID in any contracts or similar documentation kept by the recipient.

Producers are not bound by the payment limitations and the adjusted gross income (AGI) limitations that are in place for other USDA programs.

In order to demonstrate HELC/WC compliance for Partnerships for Climate-Smart Commodities incentive payments, producers will need to request a copy of their subsidiary print from their

USDA FSA field office. The Subsidiary Print includes print year specific eligibility related information about a selected producer. The producer will then provide this documentation to the Partnerships for Climate-Smart Commodities recipients as proof of compliance. A current year subsidiary print will be required for each crop year that the producer receives a payment, and HELC/WC eligibility information is provided under the AD-1026 and Conservation Compliance sections of subsidiary (determined by year, which can change at any time during the year or in a subsequent year). As is the case already, field offices will not be expected to provide documentation to anyone besides the producer themselves (and must always comply with Section 1619 limitations if they ever do provide documentation to third parties). Producers must have control of the land for the term of their beneficiary contract.

Recipients are responsible for determining producer eligibility within the funding opportunity requirements. Recipients must inform producers of eligibility requirements and direct them to local USDA offices for requested information as necessary, including but not limited to, farm and tract establishment and Highly Erodible Land and Wetland Compliance determinations. Privacy of producers is a priority throughout this process, and recipients are responsible for maintaining producer privacy in the process.

At minimum, the recipient will collect and review subsidiary reports from participating producers. They will ensure that the producer is listed as “compliant” in all sections of the conservation compliance portion of subsidiary and “certified” for AD-1026 before an incentive payment is made. If payments to a producer span more than one Federal fiscal year, the recipient will review an updated subsidiary print each fiscal year to ensure that the status is still compliant.

### **III. Other Environmental and Cultural Resources Reviews**

A Finding of No Significant Impact (FONSI) was signed by USDA NRCS on August 26, 2022. A copy of the Programmatic Environmental Assessment for Partnerships for Climate-Smart Commodities is available at [www.usda.gov/climate-smart-commodities](http://www.usda.gov/climate-smart-commodities). USDA may determine that additional environmental and cultural resources review is needed for any particular action under Partnerships for Climate-Smart Commodities. The recipient must not execute any beneficiary contracts under this grant agreement prior to receipt of a letter from USDA that specifically details:

- 1) further procedures deemed appropriate by the Agency to ensure a completed National Environmental Policy Act (NEPA) review and all appropriate consultation requirements are met, and
- 2) additional instructions for any unanticipated discoveries or conditions.

A resolution of support is required for projects on Tribal lands from the governing body of the Tribe with jurisdiction over that land, if the applicant is not the Tribe nor an entity owned or

operated by that Tribe. USDA may approve alternative documentation for resolutions when USDA deems necessary and legally sufficient.

#### **IV. Producer Benefits**

USDA encourages the recipient to disclose to participating producers the manner and amount for which any market premiums derived from the development of the relevant climate-smart commodity will be shared between participating parties, including producers. USDA will be monitoring producer benefits, in particular those to small and underserved producers, throughout the grant period. Recipients agree that their project(s) will implement a plan for engaging small and underserved producers as laid out in this agreement.

#### **V. Producer Data Protection and Disclosure**

Recipients must ensure each producer has convenient access to any data collected from that producer or the producer's land and any associated modeling as part of the project. The recipient must provide each producer applying for benefits under this grant a description in writing of how their information, including but not limited to data about their farm and commodities, will be utilized, protected and shared as applicable.

#### **VI. Other Data and Reporting Requirements**

In addition to the reporting information provided in the statement of work and General Terms and Conditions, USDA will provide a template for the Detailed Progress Report, also known as the Partnerships for Climate-Smart Commodities (PSCS) Project Reporting Workbook. Within 30 calendar days of execution of this grant, a copy of this workbook will be posted at [www.usda.gov/climate-smart-commodities](http://www.usda.gov/climate-smart-commodities) or an alternative location provided to the recipient by the National Program Officer. USDA may provide updates to the PCSC Project Reporting Workbook or submission methods to streamline the data collection process and/or reduce the burden on the recipient throughout the grant period. Generally, these updates will be provided at least 3 months in advance of any required changes. The recipient must not transfer any data to foreign governments or foreign entities without prior approval from USDA.

USDA will provide a Technical Contact for this grant. The Technical Contact will have the responsibility of technical oversight for USDA for the project. The recipient is responsible for providing the technical assistance required to successfully implement and complete the project. The recipient must comply with any requests for information from the Technical Contact. The Technical Contact for this award is the National Program Officer assigned to this grant.

Prior to execution of this grant, the recipient must provide a shapefile depicting the project boundary for enrollment under this grant. Producer enrollment may not occur outside this boundary without modification of this grant.

Within 30 calendar days of execution of this grant, the recipient must provide to the National Program Officer a website address where enrollment information will be posted for producers for the project associated with this grant. Recipients will be responsible for the following reports:

- Submit quarterly performance reports that include a written progress report, as well as additional reporting on specific data elements contained in the most up-to-date version of the Partnerships for Climate-Smart Commodities Project Reporting Workbook. Additional information about each reported element is described in the Data Dictionary.
- Submit supplemental reports required to validate greenhouse gas (GHG) benefit data, including: (1) an initial project MMRV plan, (2) field-modeled GHG benefit reports, and (3) field-direct GHG measurement results, as applicable. Additional information about these reports is included in the Data Dictionary.
- Submit copies of project outputs and deliverables (e.g., fact sheets, reports) as attachments in ezFedGrants along with quarterly performance reports.
- Report the version of COMET-Planner used to estimate GHG benefits of the project within each quarterly performance report. As COMET-Planner is updated, recipients must adopt the latest version of the tool as directed by USDA for use in performance reports.

Recipients must designate an individual as a member of the USDA Partnerships for Climate-Smart Commodities Learning Network (Partnerships Network); this representative should be identified in the Project Narrative for this grant. Each project includes a plan for up to two Partnerships Network virtual meetings and two in-person meetings a year during the project duration. Dates and other details on events will be posted at [www.usda.gov/climate-smart-commodities](http://www.usda.gov/climate-smart-commodities) or an alternative location provided to the recipient by the National Program Officer.

The Partnerships Network will be co-chaired by representative from the USDA Office of the Chief Economist and the Farm Production and Conservation Mission Area. The Partnerships Network will inform synthesis reports to be assembled by USDA on a range of topics related to the implementation of Partnerships for Climate-Smart Commodities projects, including:

- Lessons-learned as projects are implemented;
- Options for providing technical assistance;
- Procedures for measurement/quantification, monitoring, reporting, and verifying GHG benefits;
- Options for tracing climate-smart commodities through the supply chain;
- Mechanisms for reducing costs of implementation;
- A forum for discussion and learning regarding approaches to climate-smart agriculture and forestry implementation (including but not limited to deployment and

measurement/quantification, monitoring, reporting, tracking, and verification of associated greenhouse gas benefits and marketing of climate-smart commodities).

- Synthesis of outcomes; and
- Opportunities for USDA and others to inform future approaches to generating new and expanded markets for climate-smart commodities.

The Partnerships Network topics to be discussed will cover at minimum the areas described in previous FAQs and will evolve with USDA's ongoing project data analysis efforts and with input from the project recipients on the kinds of sessions that will be most helpful to them in building the diverse climate-smart markets associated with their projects. Participation may include at least one interview a year and include questions related to the following areas:

- Technical assistance approaches, methods, and successes and/or challenges
- Producer outreach approaches, methods, and successes and/or challenges
- Monitoring, measurement, reporting, and verification (MMRV) approaches, methods, and successes and/or challenges
- Marketing approaches, methods, and successes and/or challenges
- Partnership approaches, methods, and successes and/or challenges
- Data collection and storage approaches, methods, and successes and/or challenges
- Supply chain approaches, methods and successes and/or challenges, including approaches to traceability
- Supply chain benefits and demand for climate-smart commodities
- Perspectives on program design, climate-smart commodity definitions, and future approaches or opportunities
- Project successes and stories

USDA may also request producer exit reports at a later date. Additional marketing and branding-related requirements may be provided by USDA, including signage related to Partnerships for Climate-Smart Commodities.

## **VII. Competition and Anti-Competitive Practices**

In connection with this grant, recipients may not prohibit or otherwise limit a producer from changing the provider of other services or materials not included as part of this grant. Recipients may not condition, limit, steer, or discriminate in their provision or sale of non-project business functions or products to producers based on their participation or non-participation in or use of any services provided as part of this grant. Additionally, funds in this agreement shall not be used for purposes or activities related to mergers or acquisitions.



### **VIII. Suspension and Disbarment**

The provisions governing Suspension and Disbarment in subsection 1.a.8 shall also apply to fraud, embezzlement, theft, forgery, bribery, falsification, or destruction of records, making false statements, or violations of the Federal civil antitrust or unfair trade practice laws.

### **IX. Special provisions for awards to for-profit entities as recipients**

This section contains provisions that apply to awards to for-profit entities. These provisions are in addition to other applicable provisions of these terms and conditions, or they make exceptions from other provisions of the terms and conditions for awards to for-profit entities. For-profit entities that receive awards have two options regarding audits:

- 1) A financial related audit of a particular award in accordance with Generally Accepted Government Auditing Standards issued by the Comptroller General of the United States, in those cases where the for-profit entity receives awards under only one USDA program; or, if awards are received under multiple USDA programs, a financial related audit of all awards in accordance with Generally Accepted Government Auditing Standards issued by the Comptroller General of the United States; or
- 2) An audit that meets the requirements contained in 2 CFR 200 subpart F.

For-profit entities that receive annual awards totaling less than the audit requirement threshold in 2 CFR 200 subpart F are exempt from USDA audit requirements for that year, but records must be available for review by appropriate officials of Federal agencies or the Government Accountability Office.

### **X. Non-Disparagement**

Recipients may not engage in any advertising deemed by USDA as disparaging to another agricultural commodity or competing product, or in violation of the prohibition against false and misleading advertising. Disparagement is defined as anything that depicts other commodities in a negative or unpleasant light via overt or subjective video, photography, or statements. Comparative advertising is allowable, provided the presentation of facts is truthful, objective, not misleading, and supported by a reasonable basis.