

Info Note

Impactful and measurable progress on climate-smart agriculture in corporate value chains

Findings from a workshop on resilience, mitigation and food loss and waste

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Key messages

- Harmonized approaches to measuring CSA progress across companies and sectors is a priority, to enable aggregation of results and comparison of progress.
- Measuring and evaluation of adaptation efforts are increasingly important in the context of the global goal for adaptation under the Paris Agreement.
- To address the challenges associated with measuring climate resilience, a set of indicators were identified and validated for application in corporate value chains.
- Innovative ways to gather farm-level data are emerging, particularly with the use of information and communication technologies. Cooperation between companies can foster their utilization and improve measurement of CSA progress.
- Significant reductions in supply chain/Scope 3 GHG emissions can be achieved through action on food loss and waste, starting with the [FLW Protocol](#).
- Success of measurement and monitoring efforts will depend on the right incentives being provided to value chain actors for data collection and reporting. Building the business case for measurement and monitoring is a priority.

The World Business Council for Sustainable Development (WBCSD) and its partners have an ambition to reduce greenhouse gas (GHG) emissions from agriculture and land use change by 50% and make 50% more nutritious food available by 2030 (including by reducing food loss and waste), while strengthening the climate resilience of agricultural landscapes and farming communities. A 2017 study conducted for WBCSD by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CAAFS) (Vermeulen and Frid Nielsen 2017), highlighted that companies must accelerate progress to meet these ambitions. Measurement of progress was also

limited by the availability of data, particularly on upstream and downstream GHG emissions in supply chains, climate resilience and food loss and waste. To address these gaps, WBCSD and CCAFS convened a workshop at the University of Vermont, in partnership with the International Center for Tropical Agriculture (CIAT), World Resources Institute (WRI) and PricewaterhouseCoopers (PwC) to:

- Support companies in setting science-based climate-smart agriculture (CSA) targets for global corporate value chains.
- Build capacity for measurement and monitoring of climate change resilience and risks in value chains.
- Discuss approaches and tools to improve Scope 3 GHG emissions accounting.
- Improve measurement and monitoring of food loss and waste.

The workshop was attended by 15 companies, industry bodies and experts. This info note captures the key lessons which emerged.

Measurement of climate resilience in corporate value chains

In their day-to-day operations, agricultural communities, suppliers and related companies implement risk management strategies to deal with the broad range of challenges affecting the stability and sustainability of their operations. An increasing and so far undermanaged risk factor in agricultural value chains is the current and projected effect of climate variability, extreme events or longer-term changes on agricultural production systems and farmers' livelihoods. Most food and agribusiness companies lack actionable approaches and metrics to support the planning, design, implementation and monitoring of interventions that could strengthen climate resilience, enhance adaptive capacity, and reduce the vulnerability of these systems. The complexity of the

resilience concept and the debate around its exact definition in the context of climate change, and its applicability in reality, have contributed to slowing effective action.

A practical way to operationalize climate resilience is to understand the dynamic capacity of the target system, not only to return to an original state but also to absorb the impacts of climate-related shocks and stressors (e.g. floods, droughts, storms, erosion, heat, and water stress), subsequently adapting and ideally transforming in a way that enables the achievement of development outcomes. To enhance climate resilience of their value chains, companies should answer four questions:

1. **To what** type of climatic shock/stress does the target intervention aim to build resilience?
2. **Where** (geographical location and scale) and **for whom** (target type of supplier or farmer) does the resilience have to be built?
3. **For what** target outcome (e.g. productivity, resource efficiency, stable incomes) is resilience needed to be built?
4. **How** can resilience best be built for this purpose and through which context-specific crops, practices, capacity building, knowledge and/or technology transfer actions, and supporting services?

Resilience building should be seen not as an end, but rather as a process aiming to “enhance adaptive capacity, and reduce vulnerability” – as stated in the Adaptation Goal of the Paris Agreement.

A broad set of climate-smart agricultural options ([practices, technologies](#) and services) are currently implemented and tested [by CCAFS across a wide range of agro-ecological systems](#) to support the [prioritisation](#) of relevant and context-specific solutions that can improve agricultural productivity, increase resilience and when possible generate mitigation co-benefits. Tools have also been developed to provide guidance on how to translate data on climate risk and smallholder performance into targeted action plans across companies’ sourcing geographies. But, climate resilience is not only challenging to operationalize, it is also challenging to measure, namely due to the difficulty in establishing counterfactuals, quantifying impact attribution of a resilience building intervention, as well as increased data collection costs.

To address the challenges associated with quantification and measurement of climate resilience in a consistent way, in the course of the workshop, participants reviewed a short list of 28 resilience indicators proposed by CCAFS. Participants focused on indicators’ relevance, current tracking status and feasibility of future incorporation in their M&E systems. The principle “less is more” was applied in order to keep the indicators that

might be more relevant and easily measurable by companies while eventually aligning with the metrics used by the public sector and Parties to the Paris Agreement. Key highlights from companies’ feedback included:

- All indicators currently in use relate to “agricultural production systems” (major focus on resource use efficiency), but “socio-economic” and “institution and policy making” indicators are rarely addressed.
- Not all the indicators are relevant or applicable to all types of companies (some are restricted to direct supply chains), indicating the need to identify who along the value chain can track/report on what.
- Data collection has to be designed considering different typologies (of farmers, crops, value chains) and it is necessary to define the reporting scale, in order to contribute to national monitoring efforts.
- There is a major opportunity to better track promotion, adoption and outcomes of CSA options and services but a major constraint is the need for clear criteria to assess what is climate-smart in a given context/crop/system.

Since the Paris Agreement reinforced the international framework for adaptation action, measurement and evaluation of adaptation efforts are increasingly important. Currently, countries, development agencies and the private sector lack common indicator frameworks to track their progress. **It is essential to create a simplified and harmonized set of flexible indicators that enable aggregation and comparison across scales and sectors which can build on or be integrated easily into existing processes and M&E strategies.**

Improving Scope 3 emissions measurement in corporate value chains

Agriculture, forestry and other land uses contribute nearly a quarter of anthropogenic GHG emissions (Vermeulen et al. 2012). In order to meet the target of limiting global warming to 2°C in 2100 (Wollenberg et al. 2016), direct emissions from agriculture will need to be reduced by about 1 GtCO₂e annually by 2030, compared to the business-as-usual baseline, along with a reversal of deforestation and reduced emissions elsewhere in supply chains. Many companies are beginning to set [science-based targets](#): climate change mitigation targets that are in line with the Paris Agreement goal to keep global temperature increase below 2°C.

The challenge now is to measure progress towards these targets. Most companies assess and act on emissions that are direct emissions from owned or controlled sources, so-called Scope 1 emissions (e.g., company facilities and vehicles) and indirect emissions from the generation of purchased energy, so-called Scope 2 emissions (e.g., for electricity and heating). **Many**

companies, however, do not report on the emissions that occur upstream and downstream of their value chain, so-called Scope 3 emissions. For most food and fiber companies, emissions from agricultural production fall into this category. Scope 3 emissions contribute 80 to 86% of food systems emissions (Vermeulen et al. 2012) so it is important to include them in mitigation efforts.

The metric to use for measuring the mitigation pillar of CSA is well-defined compared to those for resilience: GHG emissions (CO₂e) and sequestration or avoided losses of carbon, compared to a baseline. Companies may also want to measure emissions intensity (emissions and carbon sequestration per unit of production) in order to capture change in efficiency of operations. However, there are a variety of approaches to collecting data and estimating emissions. Some companies track indicators such as the amount of raw material (e.g., beef or cotton) sourced and apply emission factors calculated from life-cycle analysis based on international statistics. Companies can also collect primary data on agricultural management from suppliers within their own supply chains. A number of tools and calculators such as [Cool Farm Tool](#) and [FieldPrint](#) are then available to translate that information to emissions and carbon sequestration. Use of such primary data better reflects mitigation efforts within a company's own upstream or downstream activities, but is more difficult to obtain.

The difficulty arises both from the complex nature of food and fiber supply chains, which complicates the traceability of raw materials from farm to factory, and the detailed data needed to measure mitigation of agricultural emissions. Companies identified several principles to enable collection and use of such data. First, there must be a clear business case for engaging in mitigation efforts at each point of the supply chain: farmers, suppliers, and traders. All actors must be incentivized in order to enable the flow of information. Second, companies should use a “light touch” approach that minimizes the data needed for measuring emissions, and maximizes the utility of data for the farmer by, for example, feeding back information on soil health or nutrient requirements. Lastly, companies should aim to gather “good enough” data and improve over time. As improvements are made, however, it is important to establish guidelines for aggregating data at different levels of granularity, to ensure consistency across supply chains and over time. Estimates of emissions calculated using different methodologies may lead to a false perception of mitigation—or increased emissions—where none exists.

Companies and service providers are developing a number of innovative approaches to address the need for data collection and management to monitor mitigation and other sustainability metrics. Tools such as the [Agricultural Life Cycle Inventory Generator](#) can be used to generate

company-specific emission factors that are comparable to those in life cycle analysis databases, addressing some of the issues with data aggregation. [Product traceability systems](#) developed to address deforestation by the palm oil industry are now being applied in the textile industry, and could help improve product traceability for other food commodities as well. Blockchain technology could also provide chain of custody for food commodities, linked to mitigation-relevant indicators from the producing farm. To make use of these opportunities, **companies' engagement to share best practices and innovative solutions is essential.**

Realising opportunities for measuring food loss and waste reduction

One area which merits special attention in relation to the mitigation of GHGs from food systems is food loss and waste. According to the Food and Agriculture Organization of the United Nations (FAO), one third of all food is lost or wasted each year (FAO 2011). Loss and waste of food happens along the entire value chain, starting at the production (e.g., unmarketable products left unharvested) to consumption (e.g., products left unconsumed and going over-date). As part of Sustainable Development Goal 12 (Responsible Consumption and Production), the United Nations have set target 12.3 to “*halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses*” by 2030. Reducing loss and waste provides a pathway to social, economic, and environmental benefits. The FAO found that the 2012 market value of food products lost or wasted was USD 936 billion (FAO 2015). In addition, decomposing food generates more potent GHGs than consuming food. Annually, global food loss and waste is estimated to generate 4.4 GtCO₂e or about 8% of total anthropogenic GHG emissions (FAO 2015). Hence, reducing food loss and waste can be an effective strategy to mitigate GHGs. Moreover, **interventions to reduce food loss and waste help limit the need to increase global food production to feed a growing population by optimizing resource efficiency.** Food loss and waste reduction efforts therefore form an integral part of sustainable intensification and contribute to mitigation and adaptation benefits as well as the opportunity to mobilize climate finance to fund investment costs. In order to help prioritise food loss and waste interventions, CCAFS has conducted analysis on the ex-ante benefits of interventions across 20 value chains in 12 countries (Nash et al. 2016). Understanding the scope and amount of food losses is important for understanding where to take action. In the spirit of “what gets measured, gets managed”, the [Food Loss and Waste Accounting and Reporting Standard](#) (FLW Standard 2016) provides comprehensive guidance for companies on what should be measured and how. The Standard is currently applied by a number of companies within their operations.

Conclusions

There is increasing interest and need for effective approaches to measure and monitor CSA progress, particularly on climate resilience, Scope 3 emissions and food loss and waste. Measurement and monitoring efforts in each of these areas is limited by different factors. While measurement of climate resilience is limited by the lack of simple and harmonized indicators, monitoring of Scope 3 emissions is limited by challenges in obtaining farm-level data. In the case of measurement of food loss and waste, many companies are in early stages. However, this workshop marked a first step of collective learning and capacity building for companies, which can enable the development and application of approaches to strengthen measurement and monitoring approaches, and effectively contribute towards global goals.

Further Reading

- [Vermeulen SJ, Frid-Nielsen S. 2017. Measuring Progress Towards the WBCSD Statement of Ambition on Climate-Smart Agriculture: Improving Businesses' Ability to Trace, Measure and Monitor CSA. CCAFS Working Paper no. 199. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security \(CCAFS\).](#)
- [FAO. 2011. Global food losses and food waste: extent, causes and prevention. Food and Agriculture Organization of the United Nations. Rome, Italy.](#)
- [FAO. 2015. Food wastage footprint & Climate Change. Food and Agriculture Organization of the United Nations. Rome, Italy.](#)
- [Nash J, Peña O, Galford G, Gurwick N, Pirolli G, White J, Wollenberg E. 2017. Reducing food loss in agricultural development projects through value chain efficiency. CCAFS Working Paper no. 204. Wageningen, The Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security \(CCAFS\).](#)
- [FLW Standard. 2016. Food Loss and Waste Accounting and Reporting Standard.](#)
- [Vermeulen SJ, Campbell BM, Ingram J SI. 2012. Climate change and food systems. Annual Review of](#)

[Environmental Resources 37:195–222.](#)

- [Wollenberg E, Richards M, Smith P, Havlík P, Obersteiner M, Tubiello FN... Campbell, BM 2016. Reducing emissions from agriculture to meet the 2 °C target. Global Change Biology 22:3859-64.](#)

This info note summarizes findings of the workshop entitled "Impactful and Measurable Progress on Climate Smart Agriculture in Corporate Value Chains" held at the University of Vermont on 27 and 28 March 2018.

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