Climate metrics: measuring progress and catalysing investment in sustainable food systems

GFFN Metrics Catalyst Group Brief

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Good Food Finance Network

UN environment programme

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Background

This brief on climate metrics is the second document published by the Good Food Finance Network (GFFN) Metrics Catalyst Group. The First Metrics Brief of the GFFN Metrics Catalyst Group is available on the GFFN website.

The **Good Food Finance Network** (GFFN) is a multi-stakeholder collaborative platform, working to develop the critical innovations that will allow sustainable food system finance to become the mainstream standard. The network is coordinated by EAT, FAIRR (Farm Animal Investment Risk and Return) Initiative, Food Systems for The Future, United Nations Environment Programme, and World Business Council for Sustainable Development. As part of its activities, GFFN organizes catalyst groups around various topics to facilitate discussion and support the development of knowledge resources for achieving its goals.

The **Metrics Catalyst Group, coordinated by the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC)** in partnership with UNEP, is intended to be a non-competitive and collaborative space, bringing together experts and practitioners on designing metrics and indicators for measuring progress toward sustainable food systems. Financial institutions and businesses that are part of the GFFN High Ambition Group could also join the Catalyst Group.

The Metrics Catalyst Group intends to contribute to improved measurement of progress towards sustainable food systems by financial institutions by (a) increasing understanding of the **challenges in measuring progress towards sustainable food systems and its importance**, (b) **identifying the need and opportunities for developing new metrics**, (c) increasing opportunities for **cross-sectoral collaboration** on sustainable food systems metrics.

This brief was developed in close collaboration with the Climate Bonds Initiative (Climate Bonds) which has been a member of the GFFN Metrics Catalyst Group since its launch in June 2022. Climate Bonds framework is expanding to define credible transitions for agri-food systems to unlock sustainable investment opportunities that aim to drive the sector to net zero.

The brief was also developed in collaboration with the **Trade, Development, and the Environment Hub (TRADE Hub)** of the UK Research and Innovation Global Challenges Research Fund (UKRI GCRF). TRADE Hub aims to make sustainable trade a positive force in the world by focusing on the impact of trade in specific goods and seeking solutions to these impacts. It conducts research on all stages of various agricultural supply chains, revealing damaging links and potential ways to make lasting change.

The development of the brief was financially supported by the **Global Environment Facility (GEF),** which is a multilateral environment fund that provides grants, policy support, and blended finance for projects addressing inter-related environmental challenges. It is the single largest source of multilateral funding for biodiversity globally.

Members of the GFFN Metrics Catalyst Group[i]

AMERRA Capital Management

CDP

Center for International Forestry Research (CIFOR)

Climate Bonds Initiative (Climate Bonds)

DuAgro

EAT

FAIRR Initiative

Fideicomisos Instituidos en Relación con la Agricultura (FIRA)

Food and Land Use Coalition (FOLU)

Food Systems for the Future (FSF)

Global Alliance for Improved Nutrition (GAIN)

Global Canopy

Global Environment Facility (GEF)

Global Farm Metric

Global Impact Investing Network (GIIN)

Green Climate Fund (GCF)

International Union for Conservation of Nature (IUCN)

Johns Hopkins University

Olam Food Ingredients

OmniAction

Planet Tracker

Rainforest Alliance

Signature Agri Investments

Stockholm Environment Institute

Sustainable Food Trust

United Nations Environment Programme (UNEP)

United Nations Environment Programme Finance Initiative (UNEP FI)

United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC)

World Benchmarking Alliance

World Business Council for Sustainable Development (WBCSD)

World Wildlife Fund (WWF)

Yara International

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[i] The brief does not necessarily reflect the individual or institutional opinion of each member of the Catalyst Group.

Introduction

Food systems are major sources of greenhouse gas emissions (GHG) while also being highly vulnerable to the effects of climate change. They contribute one third of global GHG emissions through direct release of gases from ruminant digestion and manure, land-use change (e.g. deforestation), non-regenerative agricultural practices (e.g. overuse of agrochemicals, draining of wetlands, tillage or monocultures), inefficient transportation along value chains, food loss and food waste.[1,2,3] Meanwhile, recent extreme weather events, such as heat waves and severe droughts, have highlighted the vulnerability of food systems to climate change.[4,5] The changing climate drives an increased risk of disruptions in food production (e.g. reduced crop productivity) as well as an increased risk of disruptions to later stages of the food value chain (e.g. increased frequency of floods and landslides that damage manufacturing sites).[6]

To achieve sustainability, food systems need to mitigate their emissions, reduce the social impacts of food production and adapt to the likely effects of climate change. This transformation will require innovation across many areas, such as new approaches in accounting for land use-related emissions[7,8] and emerging agricultural practices.[9] Financial institutions (FIs) are uniquely positioned to support this transition by shifting capital out of unsustainable food-related assets and into climate resilient and zero-emissions business models that create value for people, the planet and the economy.[10] To reliably measure the progress of financial institutions on this journey, there is a need for climate metrics that are applicable to financial institutions and capture all dimensions of sustainability of businesses connected with food systems.

Defining metrics and frameworks

We define **'metric' as a system or standard of measurement used by financial institutions to assess risks, and potential investments and measure the progress of specific companies or entire portfolios**. This definition is consistent with the use of the concept by the Task Force on Climate-Related Financial Disclosures (TCFD) and Taskforce on Nature-related Financial Disclosures (TNFD) that are spearheading the advancement of assessment and disclosure metrics for use by companies across the world.[11]

We **focus specifically on metrics intended for use by financial institutions** for assessing environmental, social, nutritional, and economic aspects of **food system sustainability**. The metrics can serve many purposes both pre- and post-investment. We are considering metrics focusing on direct operations at a given site, metrics focusing on any other section of the value chain (production, transport, storage, processing, packaging, and waste) as well as metrics used at the corporate or portfolio level.[11]

Metric frameworks are collections of metrics that are structured to serve specific purposes. They can have different subjects, target audiences or thematic focus.[11]

These definitions are taken directly from the Metrics Catalyst Group of the Good Food Finance Network

There are several initiatives offering or developing guidance to inform metrics that financial institutions should use to assess climate aspects.[ii] Some of these initiatives have provided specific guidance on food systems or agriculture and food sectors.[iii] However, further support is needed for financial institutions

[ii] For example, the Taskforce on Climate-Related Financial Disclosure (TCFD), the International Sustainability Standards Board (ISSB), UNEP FI Net Zero Alliances and the Science Based Targets initiative (SBTi) Finance Framework.

[iii] Such as the TCFD recommendations on Agriculture, Food, and Forest Products Metrics, and the SBTi's Forest, Land and Agriculture Science Based Target Setting Guidance.

to accelerate the transition towards sustainable systems by implementing the best practice recommendations, enabling the best environment for these improvements, removing barriers in adopting climate-related metrics that reflect the specificities of food systems.

This brief summarizes key trends in climate-related metrics used by financial institutions working in the sustainability of food systems. It also provides an overview of the current state of climate metrics. It highlights challenges that FIs face, potential solutions to these challenges, gaps in currently available metrics, and provides a set of recommendations for financial institutions and developers of metrics to improve the availability and uptake of robust approaches to measure climate performance of food-related businesses. [12,13]

Definitions

Climate change mitigation refers to efforts to reduce or prevent emissions of greenhouse gases. Mitigation can mean using new technologies and renewable energies, making older equipment more energy efficient, or changing management practices or consumer behaviour.

Climate change adaptation refers to adjustments in ecological, social or economic systems in response to actual or expected climatic stimuli and their effects. It refers to changes in processes, practices and structures to moderate potential damages or to benefit from opportunities associated with climate change.

Climate change resilience: the capacity of social, economic, and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity, and structure, while also maintaining the capacity for adaptation, learning, and transformation.

Sustainable food system delivers food security and nutrition such that the economic, social and environmental mechanisms for generating food are safeguarded for future generations.

This holistic approach considers all three dimensions of sustainability (economic, social and environmental), rather a narrow focus on any specific issues (e.g., climate).

These definitions are taken directly from the following sources: the United Nations Environment Programme, the United Nations Framework Convention on Climate Change, and the Good Food Finance Network (GFFN)

1. Trends

Financial institutions will need to keep the pace with changes needed to transition towards sustainable food systems. Determining which climate metrics to use will depend upon new emerging methods and approaches to assess the sustainability of businesses. This section outlines key emerging trends that metrics developers and financial institutions should take into account and provide insights on how these aspects might influence climate metrics for financial institutions.

Landscape approaches and large-scale land investments

Landscape and jurisdictional approaches aim to achieve social, economic and environmental objectives. An example of this would be the sustainable production of commodities across a landscape or jurisdiction.[14,15] These approaches can contribute to climate mitigation and adaptation. They can also contribute to biodiversity conservation through actions to maintain forests and other natural ecosystems.[16] Landscape approaches aim to engage different stakeholders operating within a landscape with common objectives, including financial institutions, sourcing companies, producers, governments and Indigenous Peoples and Local Communities (IPLCs).[17] The role of financial institutions includes

providing existing or new financial products that are tailored to the landscape and tailored to the institution's own objectives. The goal is to generate impact through investment.

A just transition to achieve sustainability

Climate change has negative effects on other sustainability issues such as nature, health, human rights and nutrition. A just rural transition is needed to ensure that efforts to promote climate and environmental sustainability also contribute to inclusive and equitable outcomes.[18] In food systems, there is a growing recognition that climate and environmental issues should also be looked at through a social lens that considers aspects such as access to economic benefits, nutrition, decent work, an acceptable income, land rights protection, gender and social inclusion.[4,19]

Financial institutions should aim to align with the vision for sustainable food systems and agriculture championed by the UN Food and Agriculture Organization (FAO), which balances social, economic and environmental dimensions of sustainability.[20] As social issues have an impact on, and are impacted by, every part of a food system, financial institutions should ensure that climate metrics are used and analyzed in combination with social metrics, such as gender equality and social safeguarding to avoid negative impacts of investment (e.g. displacements), and to assess opportunities to support climate resilience (e.g. equitable benefit sharing).

Sustainable and regenerative agricultural practices

Another trend that metrics developers and financial institutions need to consider is the advancement towards the adoption of sustainable and regenerative agricultural practices. These include promotion of sustainable intensification, scaling up of agro-ecological approaches, agroforestry, precision agriculture, climate resilient crops, ecological buffering and low-emissions agriculture. These practices aim to restore soil health and ecosystem functions, reduce the amount of chemical and synthetic fertilizers used and ultimately transform agricultural land from a source of emissions to a carbon sink. An example of these efforts is Regen10[21] (as seen below).

Regen10: A multistakeholder initiative with the ambition is to advance a system-wide shift towards food production that supports healthy people, nature, and the climate. One of Regen10's strategic priorities is to develop a regenerative outcomes-based framework and standardized set of metrics. The framework will guide agricultural practices and innovation in different contexts and help re-design incentive structures and reporting to be based on delivering positive social and environmental outcomes at the farm and landscape level. The framework will be grounded in farmer and indigenous communities' experiences to ensure its success and to build trust across stakeholder groups. The framework will be finalized in July 2024.

Metrics that capture whether businesses in food systems are implementing or developing these approaches will help financial institutions to track the transition to sustainable agricultural practices that also deliver climate change mitigation.

Food waste and circular economy

Another relevant trend is an increase in interest in food loss and waste, as well as its reduction through circular economy and circular agriculture approaches. Circular agriculture is a method focusing on using minimal amounts of external inputs, closing nutrients loops, regenerating soils, and minimizing the impact on the environment. When practiced on a wider scale and in conjunction with other policies about waste management, this method ensures a significant reduction in emissions and food waste.[22] By reducing food loss and waste, the food value chain becomes more efficient and GHG emissions per unit of output produced can be significantly decreased. [23,24] Metrics that capture whether businesses in food systems are adopting circular economy approaches provide financial institutions with valuable insights into future GHG emissions of the given business.

Changes in consumer behaviour and dietary habits

Consumer behaviour and preferences are an important determinant of how global food systems are shaped and function. In some countries, growing consumer awareness of climate and environmental issues could influence the demand for sustainably and locally produced food. This trend is many times combined with changes in dietary habits such as the adoption of non-meat proteins and reduced meat intake. New initiatives are emerging that promote comprehensive labelling of sustainability aspects on food products to empower consumers to select products with lower sustainability impact, including on climate.[25] Assessing the climate impacts of businesses will help financial institutions understand how resilient businesses related to food systems are to the sustainability transition risks.

2. Key challenges in climate metrics for food systems and potential solutions

This section summarizes the key challenges faced by financial institutions in adopting and using climate metrics for assessing businesses in the context of food systems and suggests potential solutions to these challenges identified by the GFFN Metrics Catalyst Group. It is important to highlight that, when assessing the sustainability of businesses in food systems, different financial institutions will potentially use different types of climate metrics. The relevant types of climate metrics depend on the type of financial institution, its level of engagement with the assessed business, the local context and other factors. It is also relevant to point out that metrics for financial institutions usually focus on climate-related risks and could include more adaptation metrics. Whereas, when talking about food businesses, the focus is strongly on GHG emissions and mitigation or reduction targets. As a consequence of this mismatch, companies cannot fully provide the information that financial institutions need. It would benefit both parties if financial institutions could assess their portfolios based on data provided by the businesses themselves.

Challenge #1: Moving beyond "financed emissions"

Most financial institutions that assess climate impact of their portfolios or potential investments focus only on one type of metric: financed emissions. Particularly in the case of food systems, climate change leads to several risks and opportunities that cannot be expressed in tonnes of tCO_2 equivalent. The importance of complementing GHG emissions metrics with other types of metrics is highlighted in the TCFD, the International Sustainability Standards Board (ISSB) and other initiatives providing guidance on climate-related disclosure and risk assessment.

This emphasizes the importance of moving beyond the measurement financed GHG emissions while tracking transition to sustainable food systems. This could involve metrics related to *climate change resilience*, e.g., tracking clients' capacity to respond to droughts exacerbated by climate change.

Metrics of exposure to transition risks are also relevant, such as a company's ability to respond to changes in subsidies that arise from international climate goals. A clear example of this is the case of the Dutch government that on the road to net-zero, they developed a national program to reduce nitrogen emissions, affecting the agricultural sector. Rabobank, as the third largest financier of the agricultural sector in the country, reclassified its exposure for the dairy sector as vulnerable. As a result, this increases the risk and creates uncertainty for the bank's agricultural portfolio. In turn Rabobank will need to adjust its lending practices for the food sector, suggesting for example to distribute risk through blended finance. The bank has also set up an investment fund for circular agriculture.[26] For financial institutions, it would be increasingly important to include transition risk metrics into their decisions.

Other types of metrics could be related to resilience strengthening, such as investment in R&D of climate resilient technologies.[iv] Additionally, incorporating climate metrics beyond emissions also refers to the inclusion of nature and nature-based metrics. As understanding of the interaction between nature and climate grows, it is increasingly becoming apparent that the two cannot be understood separately from one another and must be considered together.

Potential solutions:

- More guidance and knowledge products **to build capacity of financial institutions on how to implement other types of metrics and analyse them alongside financed emissions data.**
    - Key stakeholders: framework and standard developers, metric developers and financial institutions.
- **Increase the availability of environmental and socio-economic data for commercial use,**[v] to assess businesses against relevant additional climate metrics. Having this necessary data available would greatly facilitate the adoption of these metrics by financial institutions.
    - Key stakeholders: framework and standard developers, metric developers, public data repositories, businesses, and financial institutions.
- **Consider nature and climate metrics in tandem**, exploring and taking into consideration the complex interactions between both nature and climate to assess and address the risks arising from the twin crises.[vi]
    - Key stakeholders: framework and standard developers, metric developers, businesses, and financial institutions.
- Food businesses should **provide environmental and socio-economic data to financial institutions** for them to have a better understanding of how the businesses are managing climate risks.
    - Key stakeholders: businesses and financial institutions.
- Businesses along food value chains should **incorporate a social dimension into climate metrics, accounting for diversity, equity and inclusion.** They should also make use of appropriate safeguarding measures and identify opportunities for fostering climate resilience and equitable benefit sharing.
    - Key stakeholders: framework and standard developers, metric developers, businesses, value chain actors, and financial institutions.
- Financial institutions could **adopt climate metrics that focus on resilience, adaptation, and nature-based solutions, in addition to GHG metrics.**
    - Key stakeholders: financial institutions, framework and standard developers, and metric developers.

Challenge #2: Limited or conflicting guidance frameworks for sustainable food systems

The understanding of what represents a sustainable business with respect to climate performance differs depending on the sector. It is particularly difficult to define for food systems, which encompass closely interconnected businesses from different sectors, geographic regions and stages of the supply chain.

[iv] For other examples of metrics that are not related to GHG emissions, refer to the Green Climate Fund Mitigation and Adaptation Performance Measurement Framework, which provides examples such as increased resilience and enhanced livelihoods of the most vulnerable people, communities and regions. The Data Systems Catalyst Group is currently working on the development of integrated metrics, including food security and human health impacts to provide overall assessments.

[v] Such as adaptation measures, technology, soil health, management risks for climate hazards, assessment of vulnerabilities, carbon rights and resilience preparation.

[vi] The Metrics Catalyst Group's following brief will discuss Nature Metrics, which can provide direction for those who want to address this problem.

Most global food systems span different climate zones and regions with varying vulnerability to climate change effects. Financial institutions therefore face a significant challenge in determining which climate metrics they need to adopt to fully capture the climate-related risks and opportunities of businesses in food systems.

Some initiatives are on their way to providing more guidance for the food systems sector. For example, the Greenhouse Gas Protocol has an upcoming Land Sector and Removals guidance that could help companies account for emissions from different activities related to land use management and change.[27] The ISSB is currently developing industry-specific recommendations for the food and beverage industry as part of IFRS S2 Climate-related Disclosures Annex B. It will be critical that these recommendations adopt a food system perspective and clarify climate metrics requirements for different food system stakeholders.

Possible solutions:

- While climate disclosure and risk assessment frameworks provide general recommendations, **additional guidance on climate metrics for assessing food systems, particularly depending on the value chain position and industry, is needed**. This includes measuring the vulnerabilities and resilience of value chain actors and affected communities, with consideration of gender, race/ethnicity, disability and landlessness.
    - Key stakeholders: framework and standard developers, metric developers, businesses, other value chain actors, communities and financial institutions.
- Metric developers could provide financial institutions with an **easy-to-access guidance of climate metrics**, particularly on what metrics can be used in geographical or sectoral contexts.
    - Key stakeholders: framework and standard developers, metric developers and financial institutions.
- There is a **need for financial institutions to identify the metrics relevant to their needs and adopt them for the right assessment or reporting purposes**. Tools and repositories with different metrics related to climate (e.g., Global Farm Metric framework, Land Use Finance Impact Hub and GCRF TRADE Hub Tools Navigator) will help financial institutions know what is available.
    - Key stakeholders: framework and standard developers, metric developers and financial institutions.

Challenge #3: Difficulty in measuring Scope 3 GHG emissions and land-use related emissions

GHG emissions are measured based on three scopes: Scope 1 refers to all direct GHG emissions of a company, Scope 2 refers to indirect GHG emissions from consumption of purchased electricity, heat or steam, and Scope 3 refers to other indirect emissions not covered in Scope 2 that occur upstream and downstream in a company's value chain.[28] While measurement of Scope 3 GHG emissions is challenging in all economic sectors, the complexity of global food systems makes it particularly critical. There is high variability in how businesses assess and report their Scope 3 GHG emissions, which makes it difficult for financial institutions to compare or benchmark businesses. At the portfolio level, the inconsistencies in data available to financial institutions increase the risk of double counting emissions. Additionally, traceability is a big issue when accounting for emissions. It becomes increasingly difficult to trace back impacts in the value chain when there is not enough clarity and transparency on the different layers of processes during the distribution of a food product.

Possible solutions:

- **Businesses can strive to align their climate-related practices and reporting with TCFD disclosure recommendations**.
    - Key stakeholders: framework and standard developers, metric developers, businesses and financial institutions.
- **Framework and standard developers should engage with policy decision-makers** at national and international levels – they **could provide a guidance role in measuring scope 3 accounting.**

    - Key stakeholders: framework and standard developers, metric developers, businesses and financial institutions.
- Organizations developing climate metrics or providing guidance on how to assess climate impacts or resilience should **promote knowledge exchange between different stakeholders in food systems and, where possible, develop tailored guidance for the sector.**[vii]
    - Key stakeholders: framework and standard developers, metric developers, businesses and other value chain actors and financial institutions.
- Businesses in the land-use change sector can refer to the following guidance: SBTi, the upcoming GHG protocol Land Sector and Removals Initiative,[29] and SustainCERT, the first verification body for scope 3 emissions focused specifically on companies.
    - Key stakeholders: framework and standard developers, metric developers, businesses, and financial institutions.
- Financial institutions should **ensure they record separately Scope 1, 2 and 3 emissions of different companies in their portfolio**[30] and, where possible, also note the measurement methodologies used by the companies to calculate the emissions data.
    - Key stakeholders: framework and standard developers, metric developers, businesses, and financial institutions.

Challenge #4: Limited availability of climate scenarios for food systems

An important tool for understanding climate-related risks and opportunities of businesses, put forward also in the TCFD recommendations, is scenario analysis. In scenario analysis, businesses explore and develop an understanding of how the physical and transition risks of climate change may impact their businesses, strategies and financial performance over time.[28] A review of corporate climate disclosures in the agriculture, forestry and other land use (AFOLU) sectors by WBCSD and Vivid Economics has found that companies are increasingly adopting qualitative and even quantitative scenario analysis but reporting remains inconsistent due to varying scenario applications.[31]

Additionally, most widely used climate scenarios do not do a good job of representing the complexities of food systems, agriculture commodities or the agriculture sector.[Error! Bookmark not defined.] Tools such as the Transition Pathway Initiative, CA100+, the Paris Agreement Capital Transition Assessment (PACTA) and similar initiatives, which enable the measurement of alignment of financial portfolios with climate scenarios, should also be extended to include agriculture or food as a sector. Food systems are characterized by a large difference between sustainable and unsustainable approaches, which means representative climate scenarios need to consider how sustainable approaches will be implemented in the given food system. For example, identifying the geographical areas more vulnerable to climate where there is participation of women in food systems. On top of that, where tailored climate scenarios exist, they tend to not be focused on the role of financial institutions.

Potential solutions:

- Metrics developers and other organizations working on climate scenarios are encouraged to align with and build on the five scenarios provided in the **climate scenarios analysis and application guide for the AFOLU sectors** released by WBCSD in November 2022.[31]
    - Key stakeholders: framework and standard developers, metric developers, businesses and financial institutions.
- **Further work is needed on increasing the granularity of major climate scenarios, particularly those focusing on food systems**.
    - Key stakeholders: international organizations, climate scenario initiatives, businesses and financial institutions.

[vii] For example, the sector-specific guidance of Scope 3 Measurement & Reporting Protocols for UK Food & Drink businesses[vii], allows the assessment of how to measure and track value chains.

- Modelling of climate scenarios **need to include multiple variables and developments, to reflect the interconnected nature of food systems** including demographic trends, volatility of prices, and the raise in temperature, as well as impacts on different regions, climate risks, gender inequalities, labour and nutritional security.[32]
    - Key stakeholders: climate scenario initiatives, businesses, value chain actors and financial institutions.

Challenge #5: Aligning metrics with global goals on climate, food security and nature

Sustainable food systems play an important role in achieving global goals not only on climate but also on food security and sustainable development at large. While TCFD, TNFD and SBTi[viii] have provided clarity on climate-related risks and how the global climate goals should be translated into corporate targets, as well as providing guidance to understand and assess their nature-related risks, ambiguity remains around how the climate targets should be balanced with the role that companies play in contributing to food security and other socio-economic benefits. There are also opportunities for these targets to go beyond "doing no harm" to doing better.[33]

In the case of the TNFD, its approach considers societal dimensions of nature-related risks since it understands the inextricably linkage with local communities and society. The Banking for Impact on Climate in Agriculture (B4ICA) also recently published a guide on net zero target setting for farm-based agricultural emissions.[34] Examples include access and benefit sharing and just transition. In Annex 1 there is a table with several global initiatives on climate reporting and its offer to assess food systems, these provide a good starting point for financial institutions to approach to.

Possible solutions:

- **Benchmarks and roadmaps for target setting** for transition towards sustainable food systems, **combining all dimensions of sustainability** are needed to guide financial institutions in achieving the global policy goals.
    - Key stakeholders: international initiatives, framework and standard developers, metric developers, businesses and financial institutions.

3. Key gaps in climate metrics for food systems

Assessing climate performance of businesses within food systems requires several types of climate metrics. While there are a number of climate metrics available, some aspects of climate are covered less than others. This section provides an overview of the key gaps in climate metrics currently available to financial institutions for assessing businesses related to food systems. The gaps were mapped by the GFFN Metrics Catalyst Group.

Gap #1: Limited climate change adaptation and resilience metrics

There are insufficient climate change adaptation and resilience metrics compared to climate change mitigation metrics available to financial institutions. Climate change adaptation and resilience are multi-dimensional and more context-specific than climate change mitigation, meaning their assessment requires a more nuanced understanding of sustainability issues and the diversity of experiences and capacities. It is particularly challenging to assess in the context of food systems, where many climate change adaptation and resilience factors (e.g., climate resilience of certain crops) are not yet fully understood. Financial institutions are interested in understanding how resilient the businesses within food systems of their portfolios are. Therefore, they would benefit from the creation of a robust set of

[viii] SBTi recommendations include specific guidance for companies in forest, land and agricultural (FLAG) sectors.

adaptation and resilience metrics that they could feasibly apply. In addition, they would also benefit from a selection criteria to determine which climate change and resilience metrics are relevant to a given food systems business.

Additionally, adaptation and resilience are multifaceted topics and inseparable from other sustainability issues, like nature, which underpins all economic activities. In the case of adaptation, nature plays a huge role. To deliver ambitious climate action, the focus must expand to transformations towards nature-positive impacts and the promotion of sustainable agriculture, end of deforestation and the expansion of nature-based solutions[35].

Gap #2: Limited transition metrics

Financial institutions need metrics that assess business preparedness for policy, legal, technology and market changes. They also need them for alignment of business strategies with the latest best practice in the market and to understand the exposure of different businesses to these transition risks and opportunities. The TCFD recommendations on climate-related financial disclosure have strengthened awareness of the importance of measuring not only physical risks and opportunities related to climate change but also the transition risks and opportunities that result from policy, legal, technology and market changes related to the transition towards a low-carbon and climate resilient economy[36]. The transition metrics are particularly important for food systems, where climate is closely intertwined with other sustainability dimensions and where a lot of policy interventions, technological progress and consumer habit changes tend to focus. Key climate transition risks and opportunities for the food systems include: increased pricing of GHG emissions in emissions trading schemes, increased operational costs due to policy changes, increased reporting requirements, efficiency gains in production and distribution processes thanks to technological advances, reputational concerns and changes in consumer preferences.**Error! Bookmark not defined.**

Gap #3: Lack of data for some commodities

A recent WBCSD report[37] found that there are considerably less data available on some commodities (e.g., palm oil and coffee) in climate scenarios than on other commodities (e.g., wheat and corn). There is even less information for commodities such as algae and hemp. Where there is limited data and understanding of climate change effects available, financial institutions will struggle to assess the climate impacts and resilience of food systems. Moreover, in most cases commodity data could be quite general, e.g. "sourcing soy from Brazil carries a high risk of deforestation", making it difficult for a company to stand out and show its sustainable practices if risk analyses only consider generic commodity-country risks.

4. Recommendations

This brief reaffirmed the need for strengthening climate metrics used or available for use by financial institutions to assess businesses in food systems. While many financial institutions are using some types of climate metrics, further efforts are needed to ensure that financial institutions adopt metrics that allow them to capture all aspects of climate performance of businesses in food systems.

Recommendations for financial institutions:

- Prioritize climate metrics that are simple to use, transparent, science-based, aggregable and incentivising transition.[ix]
- Resilience is a multidimensional and context specific issue. Therefore, when considering climate metrics, other sustainable development aspects such as nature, health and nutrition will need to be considered as they are interlinked. It is increasingly important for financial institutions to see

[ix] The Portfolio Alignment Team considered alignment metrics “decision-useful” if they are simple to use, transparent, science-based, aggregable and incentivizing transition.

that climate and nature are intrinsically interconnected and should be addressed together through joint efforts. The solutions that are focused on mitigation and/or adaptation, should also have a component to conserve and use nature in a sustainable way.

- Financial institutions with existing climate strategies should review which gaps and challenges arise from the implementation of these strategies in the context of food systems, given their complexity, interconnectedness and geographical reach. Financial institutions that do not yet have climate and sustainability (social, environmental and economic) strategies should start working towards creating one and bring in the broader sustainability and food systems perspective when defining their approach. For that purpose, FIs could review existing sustainability strategies and consult with technical and community experts to assess gaps in climate-related risks for food related investments and review which metrics are being used across them to assess if they cover climate related risks.
- A following step would be to create a baseline to measure progress, prepare a budget, define feasible targets in the medium and shorter terms (e.g., 2050 commitments might be very far away down the line), and adopt continuous improvement process. This last part could include the adoption of further metrics as they become available. By tracking progress, commitments could be tackled, focusing not only on those that are measuring GHG emissions, but exploring options to include adaptation and resilience metrics.
- Seek to align the climate-related practices and reporting with TCFD disclosure recommendations to understand the exposure of different businesses to these transition risks and opportunities.
- Ensure to record separately Scope 1, 2 and 3 emissions from different companies and also note the measurement methodologies used by the companies to calculate their emissions data. Require reporting of land use change related emissions and CO2 removals separately from fossil fuels. For that purpose, GHG Protocol is currently developing the Land Sector and Removals Guidance for how companies can account and report. Engage in dialogues and initiatives to work towards standardization of metrics with other stakeholders.
- Suggest that portfolio companies ask their suppliers to report on the same data to allow comparability.
- Consider landscape approaches while measuring impacts and refer to guidance available from different sources.

Recommendation for framework and organisations developing metrics:

- Build capacity of financial institutions on existing climate metrics and data sources and provide more guidance on how to implement other climate metrics. Particular attention must be paid towards including information depending on the value chain position and industry as well as the requirements for different food system stakeholders.
- Build intersectoral partnerships that could help develop and implement some of the climate metrics that are useful for the institution's goals and contributions to international targets. Model climate scenarios to include multiple different variables and solutions, to account for the interconnected nature of food systems.
- Enhance the communication of the correct application of the standards and metrics and the types of decisions that they can inform.

Annex 1: Mapping climate reporting initiatives

There are a number of initiatives offering or developing guidance on which metrics financial institutions should use to assess climate performance and some of these initiatives have provided specific guidance on food systems or agriculture and food sectors. The table below provides an overview of the key international initiatives setting the best practice on climate reporting and disclosure and, where applicable, their specific guidance on food systems climate metrics.

Initiative	Description	Specific guidance on food systems climate metrics (where applicable)
CDP	CDP provides a data-platform for companies to self-report environmental impacts and produces aggregated and anonymised reports.	CDP's Sustainable Food Systems Initiative was launched in 2019 with the aim of taking a systems value chain approach to demonstrate the direct link and impact of food systems and emissions, water security and deforestation. Their report on food system transformation is a valuable read for all stakeholders in food systems.
FAIRR	FAIRR aims to build a collaborative investor network that raises the awareness of ESG risks and opportunities brought about by intensive animal agriculture.	FAIRR in its entirety focuses on agriculture with a specific focus on intensive animal agriculture. Therefore, their reports and other outputs provide an expert perspective on this specific sub-industry.
Global Reporting Initiative (GRI)	GRI provides reporting sector-specific sustainability disclosure standards that businesses and financial institutions can report against.	Within its sector standards, there is one on Agriculture, Aquaculture and Fishing, with material topics such as Emissions, Food security, Soil health, and Climate adaptation and resilience, Diversity and Equal Opportunity, amongst others relevant for sustainable food systems. In Soil health, a disclosure that is identified is the description of the soil management plan, including the use of fertilizers and main threats to soil.
Global Impact Investing Network (GIIN) IRIS +	Develops several knowledge products on assessing sustainability of investments in agriculture.	GIIN develops tools including the IRIS Catalog of Metrics, which is a database that can be filtered through different impact categories. GIIN has specific metrics for agriculture, climate, and financial services.
Inter-American Development Bank (IDB)	Developed operational guidelines for promoting specific impacts through lending practices.	IDB has several action and policy frameworks related to environmental and social impacts, including safeguard policies specific to environment and safeguard compliance, natural disaster risk management, gender equality, and indigenous peoples.
UNEP FI Net Zero Financial Alliances	Provides metrics and target setting frameworks for Banks, Insurers, and Investors.	All three (3) UNEP FI alliances cover sector specific metrics. Agriculture is a priority sector for the banking alliance, while the asset owner alliance has called for disclosure of specific agricultural metrics.[38] Specific agricultural metrics need to be developed across the alliances in most cases.

One Planet Business for Biodiversity (OP2B)	OP2B is an international cross-sectorial, action-oriented business coalition on biodiversity with a specific focus on agriculture.	OP2B developed a Framework for Regenerative Agriculture that aims to provide alignment on action, monitoring, and reporting with a specific focus on regenerative agriculture practices. They have already published a set of generally applicable indicators for companies to assess their progress with a specific focus on regenerative agriculture practices.
Task Force on Climate-related Financial Disclosures (TCFD)	Provides guidance for climate-specific disclosure with a business risk framing.	TCFD highlights that FIs face two types of climate-related risks: physical and transition risks. This table on examples of Agriculture, Food, and Forest Products Metrics includes especially relevant recommendations from TCFD.
Science Based Targets initiative (SBTi)	SBTi provides specific guidance for companies to set targets on their GHG emissions.	Their recommendations include specific guidance for companies in forest, land and agricultural (FLAG) sectors and for companies whose FLAG-related emissions account for 20% of their emissions across scopes.[9] This specific guidance sets robust scientific-based targets. SBTi also have guidance specific to the financial sector.[39]
Sustainable Development Goals (SDGs).	SDGs are a collection of 17 interlinked global goals designed to be a "shared blueprint for peace and prosperity for people and the planet, now and into the future".	The most relevant SDGs for food systems are: #2 – Zero Hunger #3 – Good health and well-being #5 – Gender Equality and Women's Empowerment#8 – Decent work and economic growth #10 – Reduced inequalities #11 – Sustainable cities and communities #12 – Responsible consumption and production #13 – Climate Action #14 – Life below water #15 – Life on land
Principles for Responsible Banking (PRB)	UN PRB engages with signatory banks, guiding alignment with the 6 Principles for Responsible Banking.	PRB provides guidance on topics including climate mitigation target setting, signposting towards relevant initiatives and methodologies to measure and disclose emissions.
Principles for Responsible Investment (PRI)	PRI is network of investors in partnership with UNEP FI and UN Global Compact. PRI supports responsible investors to understand the ESG implications of investments, guided by six Principles for Responsible Investment.	PRI provides an overview of climate metrics currently used by investors, including portfolio alignment, physical climate risks and greenhouse gas emissions.
Task Force on Climate-Related Financial Disclosures (TCFD)	The TCFD releases climate-related financial disclosure recommendations designed to help companies provide better information to support informed capital allocation.	TCFD has provided a number of food systems related examples in its guidance documents and the TCFD Preparer Forum for Food, Agriculture and Forest Products[43] coordinated by WBCSD has released a report reflecting on key TCFD recommendations in relation to food systems.[37]

Annex 2: Example climate metrics for assessing businesses within food systems

When assessing climate impacts or resilience of businesses in food systems, financial institutions need to use both climate change mitigation and adaptation metrics. The table below offers a list of example metrics to assess businesses' climate change mitigation efforts as well as their climate change resilience and adaptation capacity. These metrics are examples of what financial institutions could apply at portfolio level, but also what businesses could potentially implement at farm and company levels. The list is illustrative but not exhaustive. Not all of the metrics presented in the table will be applicable to all financial institutions. The units for each metric are displayed in brackets. We have included binary metrics in the list since some financial institutions welcomed their ease of implementation in analytical models. The drawback of these approaches is their reduced fidelity in representing reality.

		Climate Change Mitigation	Climate Change Adaptation
Farm-level	Net emissions on the farm that relate to each source (e.g., fuel, livestock, inputs) for each land use (croplands, forest, and grassland) – (tCO2e/year) [a]	X	
	CO_2- warming equivalent emissions of cattle and sheep farming (calculated from CO_2 equivalent emissions using GWP*, to account for the warming impact of methane emissions) – (tCO2e/year) [b]	X	
	Amount of greenhouse gas (GHG) emissions avoided by the organization during the reporting period – (tCO2e/year) [c,d,o]	X	
	Amount of on-farm carbon removals and sequestration[a], through protection or restoration of native vegetation[o] - (tCO2e/year)	X	
	Investment in climate adaptation measures (e.g., soil health, irrigation, technology) – (USD) [e]		X
	Changes of carbon stocks as a result of land use and land use changes – (tCO2e/year) [f,d] and emissions from land use and land use change in addition to agricultural uses – (tCO2e/year)	X	
	Emissions embedded in fertiliser inputs and transportation of farm inputs – (tCO2e/year) [g, o]	X	
	An assessment has been undertaken of physical climate hazards and vulnerabilities that the farm will be exposed to and measures have been taken to address these risks – (binary, y/n) [d]		X
	Having a verified farm management plan and evidence on following low-emission agricultural best practices – (binary, y/n) [d]	X	
	GHG emissions over the investment period compared to emissions at the start of that period – (tCO2e) [g]	X	
	Surface of regenerated or restored land (km^2 or %) [p]		X
Company-level	Investment (CapEX, R&D) in low carbon/water alternatives (e.g., capital equipment or assets) – (USD) [e]	X	
	Area of land with high carbon stocks converted - (km^2)	X	
	No conversion of high carbon stock lands across operations – (binary, y/n) [d]	X	
	Weighted average distance between the locations of production and consumption across products - (km)	X	
	Agricultural products are used only for domestic consumption and not exported - (binary, y/n) [d]	X	X
	Low carbon R&D success rate - (percentage) [e]	X	

	Farmers lifted to living income, acknowledging the carbon rights of farmers including fair compensation for mitigation efforts - (number or percentage) [e,h]	X	X
	Farmers engaged in training and capacity building to support farmer resilience/adaptation - (number or percentage) [e,d]		X
	Farmers with insurance against climate events - (number or percentage) [e]		X
	Having an early warning management system in place – (binary, y/n) [e]		X
	Farmers supported to implement forecasting or early warning systems – (number or percentage) [e]		X
	Farmers supported to develop verifiable climate smart agriculture activities – (number or percentage) [e]		X
	Reduction from food loss and waste at the retail and customer levels, and along supply chains, incl. post-harvest losses – (tCO2e/year) [i]	X	
	Nutritional content of food relative to GHG - (tCO2e/nutrient density unit) [j]	X	
	Agrobiodiversity index (ABDi) to measure sustainable agriculture [p]	X	
Financial institutions' portfolio-level	Absolute GHG emissions associated with a portfolio – (tCO2e/year) [k]	X	
	For a given investor, the amount of emissions allocated to them, based on their proportional share of equities - (kgCO2e/year) [l]	X	
	Amount invested in resilience capabilities – (USD) [f]		X
	Emissions of debt investments with and without known use of proceeds - (tCO2e/year) [m]	X	
	Males and females benefiting from the adoption of diversified, climate resilient livelihood options (including fisheries, agriculture, tourism, etc.) – (number) [n]		X

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c. **Global Impact Investing Network (GIIN) (2022)** IRIS Catalog of Metrics. Available here
d. **Climate Bonds Initiative (2021).** *Agriculture Criteria (Climate Bonds Standard & Certification Scheme.* Available here
e. **WBCSD (2020)** *Food, Agriculture and Forest Products TCFD Preparer Forum: Disclosure in a time of system transformation: Climate-related financial disclosure for food, agriculture and forest products*. Available here
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h. **Science Based Targets (2022)** *FOREST, LAND AND AGRICULTURE SCIENCE BASED TARGET SETTING GUIDANCE.* Available here
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j. **Doran-Browne et al (2015***) Nutrient density as a metric for comparing greenhouse gas emissions from food production*. Available here
k. **CDP (2022)** *Technical Note: Portfolio Impact Metrics for Financial Services Sector Companies*. Available here
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m. **Science based targets (2022)** *FINANCIAL SECTOR SCIENCE-BASED TARGETS GUIDANCE*. Available here
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