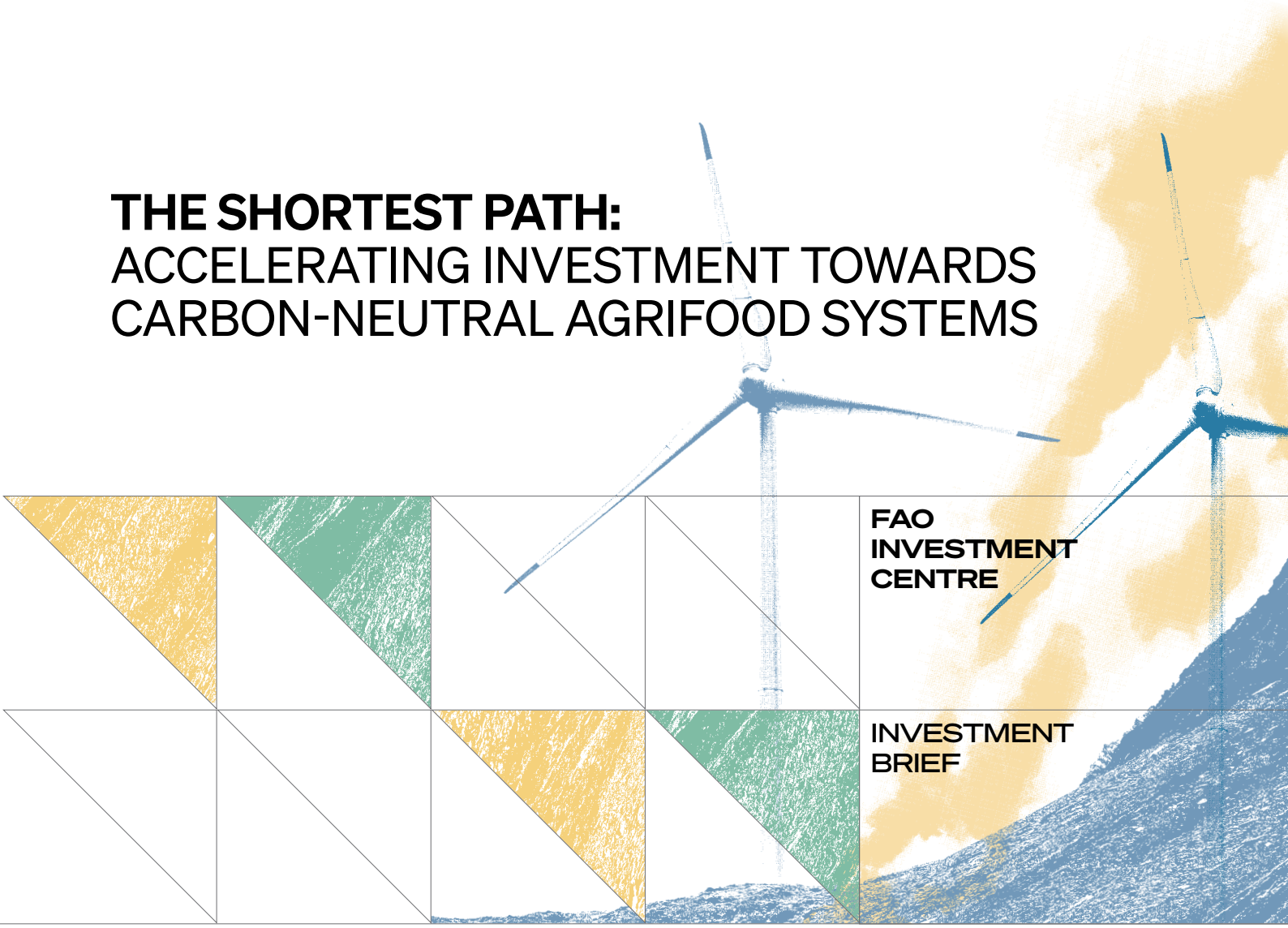
Food and Agriculture Organization of the United Nations

European Bank for Reconstruction and Development

THE SHORTEST PATH: ACCELERATING INVESTMENT TOWARDS CARBON-NEUTRAL AGRIFOOD SYSTEMS



FAO INVESTMENT CENTRE

INVESTMENT BRIEF

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As the world gears up to fight climate change, agrifood systems are expected to play their part. The sector is increasingly being targeted and curbing emissions is becoming a key global investment and policy theme.

Beyond this hype, complex issues remain. The definition of carbon neutrality is controversial. There is limited reliable and up-to-date inventory data on food production processes for accurate carbon footprint assessments and while farm-level innovations and methodologies hold promise, they are far from perfect.

Innovative institutional approaches and deployment of digital technologies are required to cut transaction costs particularly as many agrifood systems rely on fragmented supply chains including large numbers of smallholder farms. In addition, governance challenges remain in verifying the effectiveness and reliability of the different stages of a carbon neutrality path. The lack of a clear governance framework with companies often employing internal approaches to reduce emissions without independent oversight hinders more decisive action on the part of agrifood businesses, and also fails investors and consumers.

Importantly, the costs of becoming carbon-neutral can be significantly higher for smaller companies and offsetting costs – at current prices – can be much lower than reduction costs across emissions-intensive sectors.

This Investment Brief provides a synthesis of the evolving situation in agrifood systems from a carbon neutrality perspective. It explores key challenges and opportunities for achieving low carbon agrifood systems. Clearly, the story is not simple. Despite prominent commitments to carbon neutrality, complex questions remain around how to measure and achieve it in practice. This brief highlights the key problems with existing methods and standards to measure and track carbon neutrality in agrifood systems. It provides strategic insights on the steps needed to move the carbon neutrality agenda forward in terms of key investment opportunities and public policy priorities.

Turning climate change into an opportunity – why it matters

The world's agrifood systems are on the frontlines of climate change, both as a cause and a victim (Tubiello, 2021). Agrifood system emissions account for an estimated 21 – 37 percent of total anthropogenic greenhouse gas (GHG) emissions (10.8 and 19.1 GtCO2eq per year depending on estimates) (IPCC, 2019). At the same time, climate change affects agrifood system actors, from smallholder farmers to large food manufacturers, in different ways (FAO, 2016). Rising temperatures, changing rainfall patterns and supply chain disruptions already impact food production, undermining global efforts to end hunger. As a result, the number of people facing hunger could reach 1 billion by 2050 (FAO, IFAD, UNICEF, WFP and WHO, 2020).

Since the late 1990s, there has been an increasing focus on low carbon and carbon-neutral agriculture, in alignment with national and transnational policy efforts. Various governments and private sector players – including from agrifood systems – have pledged to go carbon-neutral. Countries are including agriculture in their Nationally Determined Contributions (NDCs), and governments are pushing through legislation needed to achieve ambitious carbon reduction targets. This legislation has clear implications for businesses gearing up to comply. It also sets the stage for agricultural support policies that are more directly linked to environmental performance.

There is a wide range of estimated costs and societal benefits for engaging food and land use systems in the fight against climate change. Yet the vast majority suggest very high returns for society. The total economic mitigation potential of crop and livestock activities, including soil carbon sequestration and better grazing land management, is estimated at 3 – 7 percent of total anthropogenic emissions by 2030 – based on 2020 data (Smith P. *et al.*, 2014). The potential economic value of mitigating these emissions can conservatively amount from USD 60 billion to USD 360 billion, according to assumed shadow price and offsetting costs, using USD 50 – 100 per tonne of CO2eq as social cost of carbon (World Bank, 2017) and USD 10 per tonne of CO2eq as offsetting costs. More broadly, reducing emissions, halting and restoring biodiversity loss, improving health and nutrition, and achieving inclusive growth can produce an annual societal return of USD 5.7 trillion by 2030 (FOLU, 2019). This is 15 times greater than the related investment cost of USD 300 – 500 billion per year (less than 0.5 percent of the global gross domestic product [GDP]) and would generate new business opportunities amounting to USD 4.5 trillion annually (FOLU, 2019).

Climate change is causing a shift in the investment universe, and agrifood actors need to adapt to attract investments. A powerful illustration of current trends is that Larry Fink, CEO and Chairman of Blackrock – the world's largest fund manager with USD 7 trillion in assets – in his annual letters to the CEOs of the world's largest companies, has emphasized climate change as a key threat to durable value creation for the past three years (Blackrock, 2021).

The United Nations Secretary-General (UN SG), Antonio Guterres re-affirmed in 2020 the urgent need to price carbon and to make climate-related financial risk disclosures mandatory. He also called upon banks to align their lending with the net zero objective, and for asset owners and managers to decarbonize their portfolios (UN SG, 2020).

Questions have been raised about the credibility of many sustainable investment strategies, yet the volume of investments reportedly focused on environmental and social outcomes or sustainability reached USD 30 trillion in 2018. This constitutes 25 percent of assets professionally managed globally, representing a three-fold increase since 2012 (GSI-Alliance, 2018).

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WHAT IS CARBON NEUTRALITY?

In theory, carbon neutrality is achieved when anthropogenic emissions are balanced by anthropogenic removals over a specified period (IPCC, 2018). However, in practice, the definition of carbon neutrality and related terminology such as net zero GHG emissions (Carbon Trust, 2019) have been widely debated, particularly on aspects related to emissions scope boundaries, trajectories and approaches to address residual emissions. While there are at least a dozen definitions, with more cropping up as private and public players decide to tackle their emissions, there is no widely accepted definition of carbon neutrality.

Carbon neutrality usually involves four main steps: quantification; reduction; offsetting and/or insetting of GHG emissions; and validation and declaration of carbon neutrality. The carbon footprint calculation as per ISO 14067:2018 can be applied to a product, an organization, or an entire value chain to quantify emissions, expressed as carbon equivalent units (CO2eq) by considering the effects of different GHGs through their global warming potential (FAO, 2013).

Once emissions have been quantified, efforts and investments focus on Step 2 – emissions reduction – and Step 3 – offsetting or insetting. Finally, carbon neutrality is validated and publicly declared.

CARBON NEUTRALITY FOUR MAIN STEPS

1. Quantification
2. Reduction
3. Offsetting and/or insetting of GHG emissions
4. Validation and declaration of carbon neutrality

CATEGORIES OF EMISSIONS ACCORDING TO THE GHG PROTOCOL

SCOPE 1
Direct emissions from activities within the organization's control

SCOPE 2
Indirect emissions from any electricity, heat or stream purchased and used

SCOPE 3
Other indirect emissions from sources outside the organization's direct control

The extent to which Scope 3 emissions are mandatory depends on the exact standard used

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What agrifood systems are doing about it

Agrifood sector experiences show that the impact of GHG emissions from the production, processing and transport of different goods – and even the same goods – is highly heterogeneous. In broad terms, animal products require more carbon offsetting or insetting, resulting in greater costs related to compensation. For instance, beef has a carbon intensity in terms of tonnes of CO2eq per kg of product (KgCO2eq) of up to 60 times greater than citrus fruit (Our World in Data, 2020) – such analysis doesn't take into consideration nutritional factors.

However, the problem is complex: high emissions associated with forest conversion linked to some vegetable production systems, such as palm oil, often significantly increase the carbon footprint of such products (Meijide A. *et al.*, 2020). Furthermore, the economic value of an agrifood product per tCO2eq emitted varies considerably across agrifood value chains. Overall, agrifood supply chains have significant differences in terms of cost and effort to pursue carbon neutrality for the same or similar products across various companies, business models and geographies.

So far, carbon neutrality processes are voluntary. When it comes to applying carbon neutrality standards and methodologies, only some agrifood actors rely on third-party independent certification. Other actors do it in-house, which means they typically set their own standards and devise their own labels. This approach lacks independent validation, undermining the credibility of any carbon neutrality claims. Figure 1 shows various strategies that can be followed. A few large food retailers have initially followed the approach of branding single product lines as carbon-neutral, applying carbon footprint labels on a selection of their own products. Other agrifood companies have gone much further, accounting and compensating for their full carbon footprints, including Scope 1, 2 and 3 emissions, thus claiming to have gone 'carbon-neutral'.

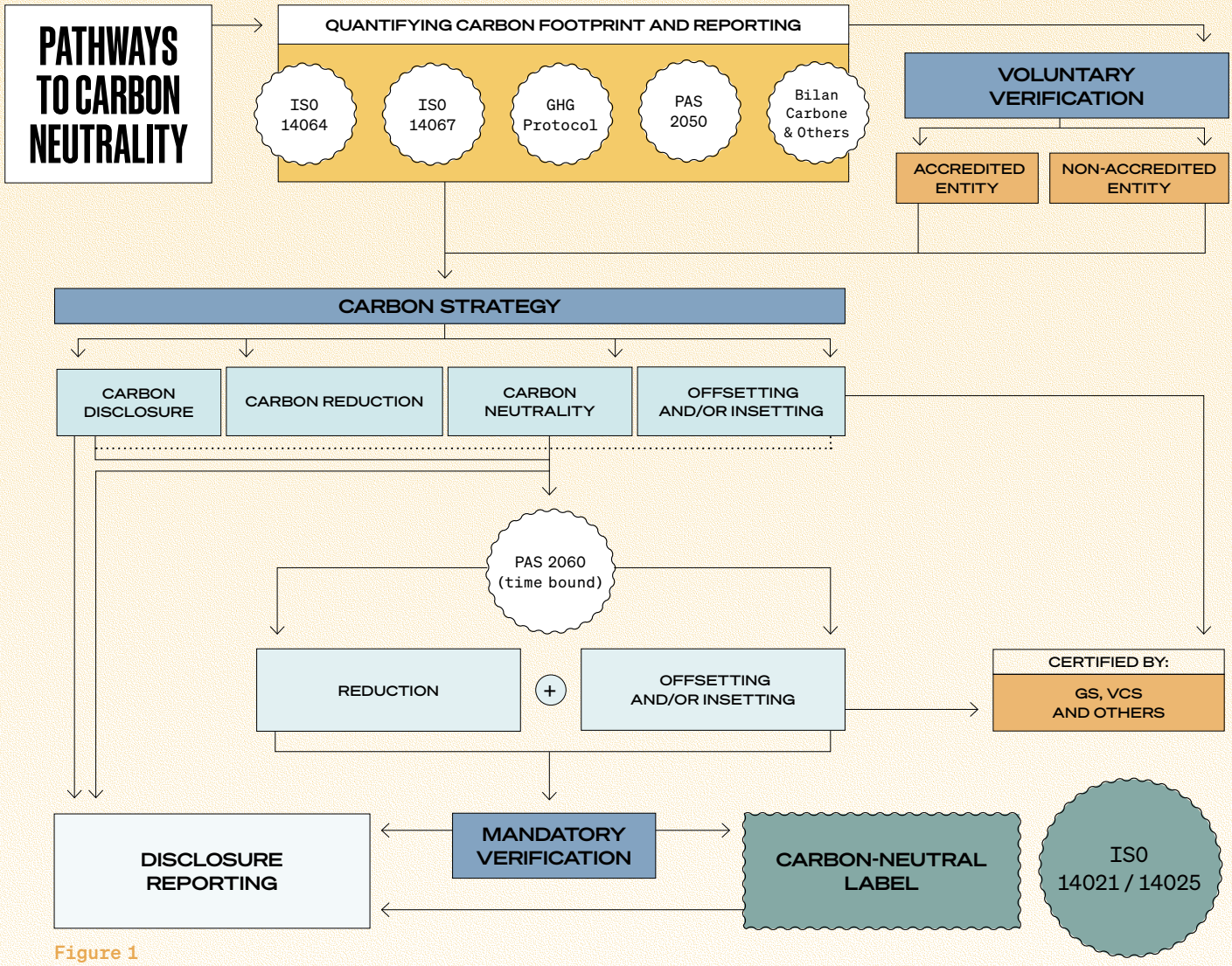

Figure 1

Strategies to pursue carbon neutrality

Source: Authors' own elaboration.

CARBON CALCULATORS MEASUREMENT METHODOLOGIES AND TOOLS

Companies can leverage innovative farm-level carbon footprint calculators and methodologies developed by a broad range of stakeholders to improve the accuracy of measuring emissions up to the smallholder level. Innovations in digital technology, including remote sensing and distributed ledger technology (DLT), are accelerating the development of more reliable agrifood value chain carbon footprint calculators. Many carbon footprint calculators require inputs at farm level and have a specific farm-scale, decision-support focus. Large companies and retailers are increasingly relying on carbon footprint calculators to refine existing methodologies and GHG emissions calculations.

Methodologies, tools and protocols developed by international financing institutions (IFIs) and specialized UN agencies can be leveraged to estimate mitigation potentials at the smallholder level. Some of these methodologies and tools from the Food and Agriculture Organization of the United Nations (FAO) include: Ex-Ante Carbon-balance Tool (EX-ACT), Ex-Ante Carbon-balance Tool for value chains (EX-ACT VC), the Global Livestock Environmental Assessment Model (GLEAM) and the interactive GLEAM-i. Protocols related to sustainable soil management (SSM) and soil organic carbon (SOC) stocks include the Protocol for the assessment of sustainable soil management and the Protocol for measurement, monitoring, reporting and verification of soil organic carbon in agricultural landscapes (GSOC-MRV). Both protocols underpin the MRV efforts of the Recarbonization of global agricultural soils (RECSOIL) initiative, which focuses on enhancing soil health and the provision of multiple ecosystem services through SOC sequestration.

Carbon neutrality can present practical advantages for agrifood actors, yet agrifood enterprises currently follow different strategies and speeds. Carbon management and emissions measurement force businesses to closely examine their processes and map their products' journeys. In doing so, they compel businesses to look at their resource efficiency, as GHG emissions are strictly correlated with resource consumption (especially energy consumption), deforestation and forest degradation, and other inputs such as fertilizers and pesticides. As they attempt to tackle carbon emissions, some companies target only Scope 1 and 2 emissions, while others attempt to reduce and/or offset Scope 3 emissions across their entire value chains. This choice is driven partly by costs, particularly in large agrifood supply chains with multiple suppliers from different locations. In practice, this means that for many agrifood actors it is much easier and cheaper to focus on Scope 1 and 2 emissions.

An increasing number of companies are showing an interest in aligning carbon neutrality with their corporate strategies by working directly with supply chain actors to reduce emissions. However, smallholder farmers generally lack the human capital or financial capacity to implement practices to improve soil health and decarbonize their own operations. They will likely require full-scale support to adopt such initiatives. Not all companies and stakeholders are interested in, or can afford the investments required, to access, organize and train smallholder farmers who are operating in highly fragmented supply chains. New voluntary carbon marketplaces which focus exclusively on compensating farmers for implementing regenerative agricultural practices to enhance soil carbon sequestration are gaining traction. Examples include Nori, Indigo AG, Soil Carbon Industry Group (SCIG) and AgriProve. These carbon marketplaces are providing opportunities for companies to directly invest in farm-level sustainability and soil carbon sequestration. While they only function in specific geographical areas, these carbon markets illustrate what could be done to develop similar marketplaces around the world.

Transformational initiatives seeking to address major challenges, such as deforestation, have employed jurisdictional approaches and sought to address different types of land use to trigger changes in agricultural practices. Ecosystem payment services and IFI support are providing farmers with financing to decarbonize and enhance soil health. More specifically, Reducing Emissions from Deforestation and Forest Degradation (REDD+) provides mechanisms where developed nations pay governments throughout developing countries to avoid deforestation and forest degradation. Payments for Ecosystem Service (PES) are serving, via national institutions, as an income source for smallholders to prevent additional deforestation, conserve forests and enhance carbon stocks. Voluntary carbon offset markets function outside of compliance markets such as the European Union's Emissions Trading Scheme (EU ETS) and can serve as important instruments for the private sector, governments and individuals to act on carbon neutrality ambitions.

Beyond the hype complex issues remain

Carbon neutrality may seem straightforward, but its narrow focus can be problematic. Due to its quantifiable and measurable nature, carbon neutrality has gained appeal amongst investors, policymakers and companies. However, carbon neutrality does not include wider environmental implications such as biodiversity, water consumption or various types of pollution. Environmental Social and Corporate Governance (ESG) rating agencies already go beyond solely considering carbon emissions to integrating wider environmental and social impacts into their metrics and reporting practices. Additionally, some companies are expanding carbon labelling efforts to include wider environmental impacts.

The costs of becoming carbon-neutral can be significantly higher for smaller companies. Offsetting costs – at current prices – can be much lower than reduction costs across emissions-intensive sectors. Figure 2 depicts the results of a simple cost model for becoming carbon-neutral, based on interviews with agribusinesses and certification service providers. The scenarios indicate that the annual costs of becoming carbon-neutral could be significant for smaller companies and will be very different across agrifood sub-sectors. In addition, reduction costs can be higher than offsetting costs and will vary, depending on the emissions reduction practice and offsetting strategy pursued through the type of carbon credits purchased.

COSTS AS PERCENT OF REVENUE INCLUDING OFFSETTING ANNUAL EMISSIONS VIA HIGH QUALITY CVCS

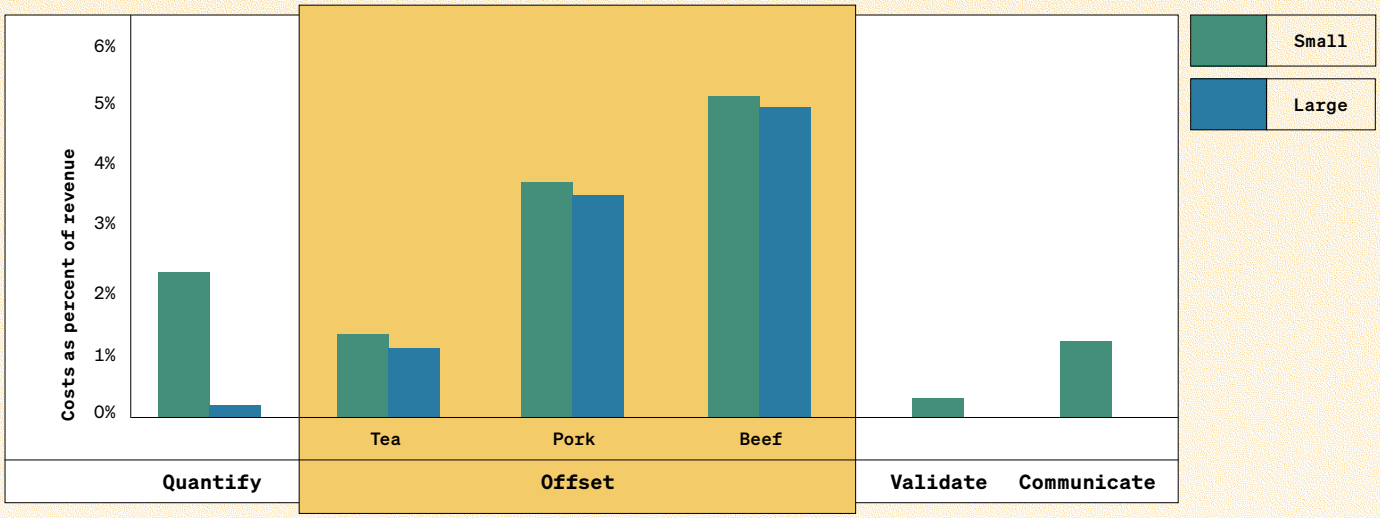

Figure 2

Simulation of costs from quantification to communication total annual emissions (for different sub-sectors and company sizes)

Source: Calculations developed by the authors.

Notes on Figure 2:

1. The analysis simulates the costs of becoming neutral when total emissions are offset via high quality carbon voluntary credits (CVCs) across the commodities of tea, pork and beef, as a percentage of revenue. This is based on fully vertically integrated companies and costs are annualized.
2. High quality CVCs, or third party verified credits, are estimated to have an average price of USD 7.50 (average of range USD 5 – 10 per tCO2-eq).
3. The annual emissions for a small and large tea company have been estimated to be 1487 and 148 672 tCO2-eq yr–1, respectively and are multiplied by the high quality CVC price (USD 7.50) and divided by the annual revenue for a small and large company (USD 1M and USD 100M, respectively).
4. Pork annual emissions for a small and large company are 4755 and 475 488 tCO2-eq yr–1, respectively, while for beef these values are 6571 and 657 121 tCO2-eq yr–1. The annual emissions for a small and large company producing pork and beef have been multiplied by the high value CVC price and divided by the revenue to generate the percentage of revenue values.
5. For simplification purposes, quantification, validation and communication/labelling costs are assumed to differ across company sizes, but to be the same across the commodities. These costs have been estimated through the insights gathered from the interviews with certification service providers and agribusinesses and are expressed as a percentage of the revenue by company size.

Limited reliable and up-to-date inventory data on food production processes hinder accurate carbon footprint assessments. While approaches for measuring emissions exist, they have not always been designed specifically for the agrifood sector. These approaches, which include measuring carbon sinks related to agricultural practices such as soils, continue to be refined. However, they can be technically difficult and costly to apply (Gold Standard, 2018). This means there are serious limitations to the carbon inventories for agrifood systems produced with traditional life cycle assessment (LCA) methods. When data is available, it is often not at the spatial and temporal resolution needed to provide an accurate representation of complex agricultural practices. This spatial variability is seldom considered in LCA databases and models, which tend to adopt blanket figures from global inventories that often exclude land cover changes and other aspects in the calculations. Furthermore, reliable aggregated data for GHG emissions and soil carbon stock changes are largely lacking.

Although farm-level innovations and methodologies to measure and verify CO2eq emissions hold promise, they are far from perfect. Various methodological challenges hamper the development and functionality of carbon footprint calculators. Even if new digital technologies are effectively deployed, many agrifood systems rely largely on smallholder farming. This implies the need to develop and apply innovative solutions that create incentives for market actors across fragmented supply chains to measure the carbon footprint of commodities and reduce emissions throughout different supply chain stages. Furthermore, governance challenges in verifying the effectiveness and reliability of innovative tools and approaches remain.

Besides technical and methodological problems, the lack of a clear governance framework hinders more decisive action on the part of agrifood businesses, and also fails investors and consumers. There are several reasons for this. Firstly, the multiple terms and definitions confuse consumers and businesses alike. Secondly, the lack of transparency on how carbon reductions are achieved can undermine the public understanding and perception of carbon neutrality. This is especially true when companies and organizations employ internal approaches to reduce emissions, as these approaches may not be subject to independent oversight or transparent disclosure practices. Thirdly, confusion arises from the absence of comparable standards and databases for measuring carbon offsets. Finally, the proliferation of carbon and environmental labels and lack of governance on climate-related disclosure practices undermine credibility for consumers and investors.

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CARBON MARKET DYNAMICS

Carbon markets are experiencing strong momentum, but they are also challenged by governance problems and supply constraints. Unlike compliance offset markets – such as the EU ETS, which accounted for around 90 percent of the total global value of carbon markets and by volume in 2020 (Refinitiv, 2020) – voluntary carbon marketplaces (for offsets and removals) have been developed by the private sector with carbon credits verified through standards created by a range of actors. Furthermore, voluntary carbon marketplaces do not have a centralized repository for price and volume data, and credits are transacted bilaterally and over the counter (Forest Trends' Ecosystem Marketplace, 2020 and European Commission, 2015). These dynamics may contribute to a lack of trust in carbon credits, due to challenges related to additionality, carbon leakage, permanence and accounting.

Several studies suggest carbon markets are expected to grow substantially and reach a value of USD 50 billion by 2030 as companies beyond agriculture look for carbon offsetting and removal options (McKinsey, 2021). However, there are concerns about the ability to develop a sufficient amount of new high quality offsetting and removal projects for many reasons and, in particular, because of capacity constraints at consultancy firms, agrifood system actors and other agents involved in developing offsetting and removal credits.

While sustainable investments are gaining ground, smallholder farmers and smaller companies may not stand to immediately benefit from developments in sustainable finance. In the agrifood sector, institutional investors tend to invest in listed equities or agrifood company bonds rather than directly in primary agriculture. Working with smaller actors in agrifood systems can involve significantly higher transaction costs and risks. Therefore, many agrifood system actors may not be directly eligible for sustainable financing. Nevertheless, smaller actors often form part of global food chains that include large companies, and these companies are increasingly being pressured to involve smallholder farmers to address their Scope 3 emissions.

The lack of standardized ESG reporting practices, limited transparency in ESG rating methodologies, and inconsistent disclosure requirements hinder comparability and the integration of sustainability factors in investment decision-making. These factors present challenges to both investors and companies alike in converting sustainability-based commitments into practice. Diverse outputs across major ESG rating providers, compared with traditional credit ratings, can generate confusion amongst investors and fund managers as to what a high ESG-rated company entails. If not addressed, this could undermine their confidence in ESG scores, indices and ESG-based portfolios. Inconsistent disclosure requirements make it difficult for investors and corporate stakeholders to communicate ESG-based decisions, outcomes and performance criteria to beneficiaries and shareholders. Relevant protocols, the EU Taxonomy for Sustainable Activities and the Task Force on Climate-related Financial Disclosures (TCFD), could prove to be crucial in streamlining climate-related disclosures and the use of consistent ratings methodologies.

Questions about consumer preferences and willingness to pay a premium are largely unanswered. In several parts of the world, citizens are demanding action on climate change. While these demands reflect increasing awareness of the urgency of climate action, their impact on purchasing decisions has not been investigated comprehensively, and no consensus exists on how to promote individual climate action (Nisa *et al.*, 2019). Evidence from high-income countries suggests that most consumer choices today are unlikely influenced by carbon-related labels (Feucht *et al.*, 2018). The situation may evolve quickly as the impact of climate change becomes more visible. Still, there is a need for simpler, more transparent and reliable consumer communication on environmental impacts of products, as well as other complementary measures to provide incentives for the adoption of lower carbon strategies in the agrifood sector.

While carbon has been touted as the 'new calorie', there is still a lot that can be done to promote effective environmental labelling in the agrifood sector. Carbon labelling has gained more traction through wider awareness of climate change. This renewed interest can be seen in large conglomerates and multinational companies pledging to carbon label their full product portfolios. While these announcements, combined with some retailer initiatives, create new momentum, widespread adoption of carbon labels is still a challenge. The vast array of environmentally friendly labels makes it difficult for consumers to recognize and compare product emissions through labels (Lacey, 2020). Lessons and best practices from the development of nutritional labels could provide insight on the effectiveness of carbon labels. Furthermore, public action, particularly on standardization, increased transparency and reliability could help accelerate the adoption of environmental labelling.

In short, the agrifood sector's experiences with carbon neutrality show that it is a lengthy process; it takes time before results appear, and it requires sustained corporate commitment. A carbon neutrality strategy requires significant financial and human resources, often with unclear financial benefits, especially in the short term.

Working towards carbon neutrality in agrifood systems is not just a box-ticking exercise that can be outsourced to external consultants and third-party verifiers. It does not just involve the costs of getting certified. It is a much broader endeavor. It requires executives to empower technical staff to mainstream carbon neutrality concepts and approaches across a company's operations and support broader changes in organizational culture and practices. Unless there is strategic corporate commitment, it will be difficult to pursue carbon neutrality in practice.

Reducing the distance towards carbon-neutral agrifood systems
Five action areas

While the prospect for carbon-neutral agrifood systems seems distant today, there is a need to push this agenda forward because of the critical links between agriculture and climate change. The private sector can genuinely embrace shared values to reduce costs, mitigate risks, protect brand value, ensure long-term supply chain viability, and gain competitive advantages. Yet, the level of effort is uneven, and agribusinesses rarely go all the way towards achieving carbon neutrality (i.e., Scope 3) with the current set of market incentives. This is largely due to the voluntary nature of carbon neutrality, as well as market failures.

In light of the challenges to reduce the distance towards achieving carbon neutrality in agrifood systems, the following set of five action areas can be considered by policy-makers and development partners.

ACTION AREAS

1. Strategically target carbon neutrality
2. Improve tools and methods
3. Develop and promote sound governance mechanisms for low-carbon pathways
4. Direct support for decarbonization efforts
5. Develop capacities and share knowledge

1 ACTION AREA

Strategically target carbon neutrality

Policies, strategies and roadmaps with clear targets at central government and decentralized/sector level are important signals to agrifood systems players.

These policies, strategies and roadmaps can set the tone for how policy evolves and can support agrifood systems players in preparing for regulatory changes and developing their targets and strategies. They can also provide incentives for simplifying and harmonizing standards. Where possible, strategies, decarbonization roadmaps and targets should be aligned with and support the achievement of pledged NDCs. Governments play a central role in adjusting incentives for the private sector to move towards carbon neutrality. Since consumer demand does not at present seem to be a major driver of companies' efforts on carbon neutrality, there is a need for additional market incentives and regulations to drive the accurate valuation and pricing of carbon. Governments can also actively develop new opportunities to achieve carbon neutrality, including the creation of national carbon marketplaces specific to agriculture and the use of green public procurement (GPP).

2 ACTION AREA

Improve tools and methods

The development and promotion of policies, strategies and roadmaps should be underpinned by methodologies and carbon footprint calculators that support data collection and estimation efforts.

Alliances between governments, international agencies and the private sector should be formed to support data availability and establish and harmonize information systems. Standardized approaches for MRV, database development and accounting methodologies must be leveraged to measure emissions and removals from the agrifood sector. Standardized carbon accounting disclosures in line with financial reporting approaches need to be employed to enable greater transparency amongst consumers and investors. Given the global nature of climate change, government, industry-wide organizations, IFIs and international organizations need to provide oversight and harmonize carbon neutrality standards.

3 ACTION AREA

Develop and promote sound governance mechanisms for low-carbon pathways

Increasing the accessibility of MRV systems and methods should be supported by sound governance mechanisms to ensure that these are appropriately endorsed and used by the private sector.

Improving the governance for offsetting schemes can serve as a reference to orient decarbonization investment and communication efforts. In particular, governments should promote high quality national offsetting programs, clearly distinguishing between removals and avoided emissions, and establish clear guidelines on carbon neutrality based on international standards. Public action, particularly on standardization, increased transparency and reliability, can help accelerate the adoption of environmental labelling and climate-related disclosure practices. Streamlining climate-related disclosure practices can provide agribusinesses with opportunities to adequately price risks and attract capital.

4 ACTION AREA

Direct support for decarbonization efforts

Costs for achieving carbon neutrality differ widely, both in terms of low-carbon pathways and whether these pathways are employed by large and small companies or smallholder farmers.

Public intervention and IFI support are often required to subsidize MRV efforts when carbon related externalities are not correctly priced. Clear pathways should be developed to allow companies to inclusively compete in the space for carbon neutrality. Direct support through concessional financing, subsidies, and other forms (such as GPP instruments) can all help companies' decarbonization and MRV efforts on a wider scale. Companies need to systematically support agrifood actors in their wider supply chains to qualify for carbon marketplaces and PES schemes to ensure they are compensated for sustainably applying agricultural regenerative practices. Direct support also applies to the development of green financial products and financing options for agrifood systems players who adequately carry out carbon reductions. The promotion and implementation of de-risking solutions especially tailored to reducing transaction costs and risks associated with Scope 3 emissions are important. Finally, decarbonization will also require maintaining and protecting carbon sinks. Halting deforestation and leveraging the role of farmers as suppliers of environmental services are vital to address climate change.

5 ACTION AREA

Develop capacities and share knowledge

Improved awareness raising can support carbon labelling and sustainable investing.

Government- and industry-led efforts to disseminate and streamline information can enhance consumer understanding and possibly influence purchasing behavior. Integrating terminology related to decarbonization, MRV practices, carbon accounting methodologies and green financing tools into education agendas can support the greening of agrifood systems. It can also generate opportunities for collaboration between international organizations and the private and public sectors. IFIs and technical agencies can play an important awareness-raising role and collaborate with agri-consultancy companies, local advisory services and research institutions to mainstream the business case for adopting climate change mitigation and adaptation practices. Governments and technical international agencies can support the dissemination of best practices, and governments can fund the research required for labelling and life cycle assessment efforts.

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Abbreviations and acronyms

CO2eq	Carbon dioxide equivalent
CVC	Carbon voluntary credit
DLT	Distributed ledger technology
EBRD	European Bank for Reconstruction and Development
ESG	Environmental Social and Corporate Governance
EU ETS	European Union's Emissions Trading Scheme
EX-ACT	Ex-Ante Carbon-balance Tool
EX-ACT VC	Ex-Ante Carbon-balance Tool for value chains
FAO	Food and Agriculture Organization of the United Nations
GHG	Greenhouse gas
GLEAM	Global Livestock Environmental Assessment Model
GLEAM-i	Global Livestock Environmental Assessment Model - interactive
GPP	Green public procurement
GSOC-MRV	Protocol for measurement, monitoring, reporting and verification of soil organic carbon in agricultural landscapes
Gt	Gigatonne or 1,000,000,000 tonnes
IFI	International Financial Institution
ISO	International Organization for Standardization
LCA	Life cycle assessment
MRV	Monitoring, Reporting and Verification
NDC	Nationally Determined Contribution
PAS	Public Available Specification which is developed through the British Standards Institution
PES	Payments for Ecosystem Service
RECSOIL	Recarbonization of global agricultural soils
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SOC	Soil organic carbon
SSM	Sustainable soil management
TCFD	Task Force on Climate-related Financial Disclosures
UN SG	United Nations Secretary-General

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