Food and Agriculture Organization of the United Nations

Rabobank

NOVEMBER

2022

Global system for carbon farming

a holistic climate change solution

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10 POINTS TO SPEED UP TO ZERO CARBON WITH CARBON FARMING

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[1] VCM: Voluntary Carbon Market.

[2] NDC: Nationally Determined Contributions, the efforts required by each country per the Paris Agreement.

PART 2
RELEVANCE OF CARBON FARMING

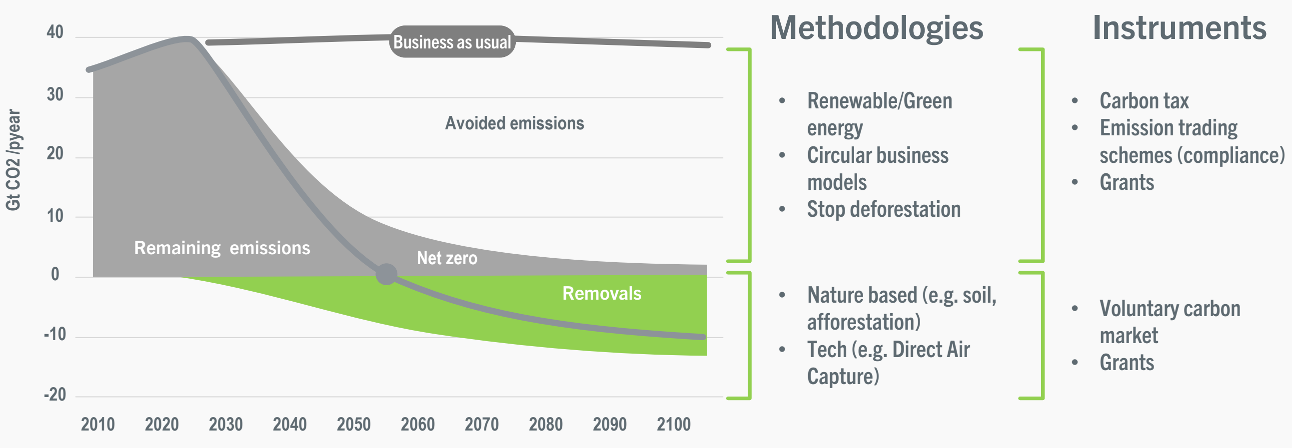
2.1 Global impact of farming

Farming has a significant impact on greenhouse gas emissions. Various greenhouse gases like CO2, N2O and CH4 are a result of farming practices with a total of AFOLU[3] above 20 percent of total anthropogenic greenhouse gas emissions, while CH4 AFOLU accounts for more than 40 percent and N2O AFOLU even for almost 70 percent.
Unlike other larger emitting sectors, agriculture is uniquely positioned to offset a substantial portion of global emissions by 2050, through a combination of farming methods that has been coined as carbon farming.
The agricultural sector therefore is key in reaching the goals of the Paris Agreement.

2.2 Need for carbon farming

To combat climate change, we have to reduce the amount of CO2 in the air. It is therefore of uttermost importance that corporates reduce their emissions; this should include their scope 1, 2 & 3 emissions footprint. Companies should expend (and prove) a significant effort to reduce their carbon footprint in line with internal ambitions to limiting a global temperature increase to 1.5 degrees. So only their unavoidable emissions in their pathway to net zero can be compensated. This way, we do not just slow or halt climate change, but actively reduce its influence. Next to compensation of current emissions, anthropogenic emissions of the past decennia have to be removed as well. Additional removal via carbon

FIGURE 1. GLOBAL CARBON EMISSIONS AND MITIGATION STRATEGIES



[3] AFOLU: Agriculture, Forestry and Other Land Use.

farming is a feasible and affordable method. The projected economic mitigation potential of the options in agriculture via improved and sustainable crop and livestock management, and carbon sequestration into agricultural soils and above-ground biomass, can contribute **1.8–5.5 Gigaton CO_2 (eq) per year in 2030.**[4] Yet, the use of carbon sequestration in agriculture to combat climate change is still very limited. We as governments can help to scale up this important nature-based solution. If we manage soil health intelligently, it can be our greatest ally in our fight against climate change.

Sustainable and regenerative food systems provide vital ecosystem services, while they represent significant emission-saving opportunities. Sequestering carbon in agriculture will have mutual benefits for **climate change** adaption and mitigation and **food security**. Our society is facing the challenge to produce enough nutritious, affordable food for everyone while respecting the planet. Climate change is already threatening food production in parts of the world. By changing their practices to regenerative farming, farmers all over the world can be a major part of the solution. They grow the trees and crops and work the soil that can meet the increased need for food, and at the same time reduce greenhouse gas emissions and remove carbon from the atmosphere and sequester it in in their land. By utilizing farming principles like regenerative agriculture and increased sustainability, with the focus of reducing and sequestering carbon, farmers can implement **carbon farming**. Carbon farming offers a fair income for the ecosystem services provided by farmers through nature-based carbon credits.

[4] Figure SPM.7 in the IPCC report, Summary report for policy makers.

PART 3
METHODS FOR CARBON FARMING

	Agroforestry	Soil organic carbon	Biochar	Manure management	Nitrogen reduction biofertilizer
Category	Removal	Removal	Removal	Reduction	Reduction
Description	Agrisilvicultural, Silvopastoral or Agrosilvopastoral systems. Trees with plants and/or animals sequestering carbon	Reduced/no tillage, reduced inputs, planting of cover crops, crop rotations, optimised grazing patterns, species composition sequestering carbon	Partly burnt biomass is added to soils absorbing additional CO2	Feed additives and supplements that reduce methane and nitrogen emissions and other technical applications	Biofertilizer with special functional microbes reduces ammonia volatilization
Ecosystem services	●	◑	◔	○	◔
Cost	◔	◑	◑	◑	◑
Potential	◑	◑	◑	◑	◑
Technology	●	●	◔	◑	◔

Ecosystem services ◔ Limited co-benefits ◑ 50-100 ● Many co-benefits >200
Estimated cost [USD/ton CO_2] ◔ <50 ◑ 50-100 ◕ 100-200 ● >200
Estimated Potential Globally [Gton CO_2/year] ◔ <0.5 ◑ 0.5-1.5 ◕ 1.5-4.0 ● >4.0
Technology ◔ R&D phase ● Market ready

Source: Negative Emissions Technologies and Reliable Sequestration: A Research Agenda (2019)

FIGURE 2. OVERVIEW CARBON METHODS

3.1 Agroforestry

Agroforestry is a collective name for land-use systems and technologies where woody perennials (trees, shrubs, palms, bamboos, etc.) are deliberately used on the same land-management units as agricultural crops and/or animals. Agroforestry is an ancient practice or indigenous technology. Due to the planting of trees, carbon is sequestered trough photosynthesis in above-ground and below-ground biomass as well as in soils.

Benefits of agroforestry are amongst others:

- improving soil health
- increasing climate change & weather resilience
- diverse nutrients
- high-quality nutrients
- improved yield per ha
- income depends on different harvest streams
- afforestation

3.1.1 Agrosilviculture

Agrosilvicultural systems entail a mix of crops and trees, such as shade systems (like coffee with citrus trees) or border planting.

3.1.2 Silvopasture

Silvopastoral systems combine trees and animals, such as cattle grazing in coconut groves.

3.1.3 Agrosilvopastoral

Agrosilvopastoral systems integrate all three: trees, crops, and animals, such as home gardens involving animals or woody hedges grown for fodder.

3.2 Soil organic carbon

Broadly speaking, up to six main practices can increase soil organic carbon without tree biomass on a farmer land. These practices include:

- reduced/no tillage
- reduced inputs
- planting of cover crops
- crop rotations
- optimized grazing patterns
- species composition

3.3 Biochar

Biochar can be broadly described as a carbon-rich material which is produced when biomass is put through a process called pyrolysis. Pyrolysis is thermotical decomposition of biomass at temperatures in the region 700 °C in the absence of or with limited supply of oxygen (Jamaludin, Rashid and Tan, 2019).

Biochar has come into focus in recent years as it can supply a carbon-rich product for application on agricultural fields that can help sequester carbon in the production process and can have positive effects on crop yields (Woolf *et al*, 2010) and soil health (Das *et al*, 2021) amongst other proposed benefits. Biochar however is not a new product. Its use in agriculture has been traced back over 2000 years to the Amazon Basin, where it is believed biochar was used by an indigenous culture to enhance soils and create some of the region's terra preta, carbon-rich, soils which can also occurred naturally (Kamarudin *et al*, 2021). The carbon that is in biochar comes from the carbon sequestered by the plant biomass before it becomes biochar and through the pyrolysis process this is locked into the biochar for 100 years (Schmidt, Kammann and Hagemann, 2020). This carbon stability and the soil improvements that can be achieved make biochar a very attractive proposition for the agricultural industry. It is also worth stressing that this is not only a solution for industrial western agriculture, but much work is also being done to promote and educate smallholders on the production, use and benefits of biochar (Scholz *et al*, 2014).

3.4 Manure management

Animal agriculture is responsible for a large percentage of global greenhouse gas emissions: estimates are roughly 14 percent (FAO). Changes in feed can reduce the carbon footprint. Additionally, technical applications for manure management can reduce greenhouse gas emissions.

3.5 Biofertilizer

N2O emissions could be mitigated by replacing synthetic fertilizer sources with either biofertilizer or compost (Cardoso *et al*, 2020).

PART 4
BENEFITS OF CARBON FARMING

4.1 Climate impact and potential

There are many types of carbon projects; there are even many different types of nature-based solutions to our global carbon emissions that all focus on sequestering carbon in trees, roots, and soils. But the key thing that differentiates carbon farming from other carbon-focussed projects, is the interplay between human and nature.

Unfortunately, there are countless examples of carbon or forestry projects failing because of many different reasons. The most common reasons all have to do with the fit with indigenous culture, climate and most importantly the community's needs.

The species planted need to be suitable for the local climate, otherwise they will wither, and the project will fail. Simultaneously, the local community needs to have the knowledge of how to care for the carbon farming interventions: this is key in maintaining it successfully. Many non-local species require additional water, specific fertilizers, management practices and so on.

If non-local species are planted, then the community needs to benefit from them. If these more fragile species do not serve a purpose to the humans on whose land they grow, they will not survive because they will not be cared for correctly. The same goes for management practices like no tillage to increase soil organic carbon – if the farmer does not benefit from the practice, the carbon will be released in the atmosphere in no time.

Another key characteristic of carbon farming is its needs for compromise when balancing agricultural productivity, regeneration, biodiversity, and income for the farmers. Carbon farming can never be 100 percent carbon-focussed because carbon sequestration and emission reduction always happen in the context of other farming activities. This means that when designing a carbon farming strategy, the carbon component will never be leading in decisions made. Later we will dive deeper into the pricing of carbon farming ecosystem services.

From the examples above it becomes clear that carbon farming is not just about planting trees and walking away; it requires a much more delicate balance between humans and nature. But if this balance is struck, carbon farming has the potential to sequester large amounts of CO2 yearly.

4.2 Biodiversity and land restoration

Carbon farming may have a slightly misleading name, because of the large focus on carbon. In recent years, the carbon market has developed as a mechanism to finance the de-carbonization of our planet, so the word "carbon" has been receiving plenty of attention. But in the case of carbon farming, carbon actually takes much more of a supporting role than the lead of the story. Because the impact of carbon farming goes far beyond storing carbon on our farmlands and lowering farm-based emissions.

The real impact of carbon farming can be seen in its capacity to restore soils, to regenerate degraded land, and even to reverse the process of desertification. The practices detailed earlier all contribute to these goals of regeneration and soil health in a different way, so there is no one-size-fits-all approach. Some practices like SOC or biochar contribute mostly to soil health and regeneration, while agroforestry also significantly improves biodiversity.

4.3 Food security

Millions of smallholder farmers worldwide that feed billions of people (Alpízar *et al*, 2020) are suffering from food insecurity, as they are often heavily impacted by climate change. By diversifying their crops, farmers build resilience against pests and failed harvests due to the different harvest cycles, different crop types and climate adapted species. This diversification is crucial for risk mitigation, giving farmers more than one mono-crop yearly yield.

If done correctly, the risks of pests destroying a harvest can be further mitigated. There are many examples of secondary crops repelling pests. Another pest repellent strategy is planting decoy crops, which divert the pests' attention away from the cash crops.

A second benefit of diversification is the nutrient diversity, not just for the farmer's own subsistence, but for their surrounding community. Agroforestry at scale can achieve this nutrient diversity when carbon farming expands its focus from just carbon benefits to nutrient diversity and farmer risk mitigation.

4.4 Farmer livelihoods

When assessing the impact of carbon farming practices, it is important to be transparent about the timeframe that is considered. Not all carbon farming interventions generate higher yields immediately, but they all have one thing in common: they strengthen the health resilience of the agricultural land long-term. Globally our demand for food is rising rapidly, while our topsoils are degrading, and our lands are desertifying or washing away in floods. Having healthy soils to farm on is crucial for any farmer's survival.

In practice this can mean that farmers will see their land value increase over time, see the quality of their produce increase, or even diversify their income streams by adding additional strata of vegetation. Keeping cover crops, adding perennials, or rotating crop cycles all increase the yield from the land.

Especially for smallholder farmers, the transition to carbon farming can have a tremendous impact on their livelihoods. Smallholders are indispensable for global food production, while they farm on small plots of land, without heavy machinery. This gives them the freedom to significantly diversify their crops and incorporate perennials, since no machines will destroy them during harvest.

The long-term benefits of carbon farming do come with a price: they need investments. So, while it seems only logical to invest in carbon farming, we cannot forget that most farmers worldwide experience heavy financial pressure. Often farmers (large and small) live harvest to harvest, having no means of investing in their farm's future. And if farmers gain access to finance (which is highly unlikely for smallholders), the repayment period is one year, further enforcing the paradigm of annual crops and high chemical fertilizer usage to achieve the yields needed to repay the loan.

Carbon farming has the potential to drastically improve the livelihoods for farmers, but it comes with one condition: long-term thinking.

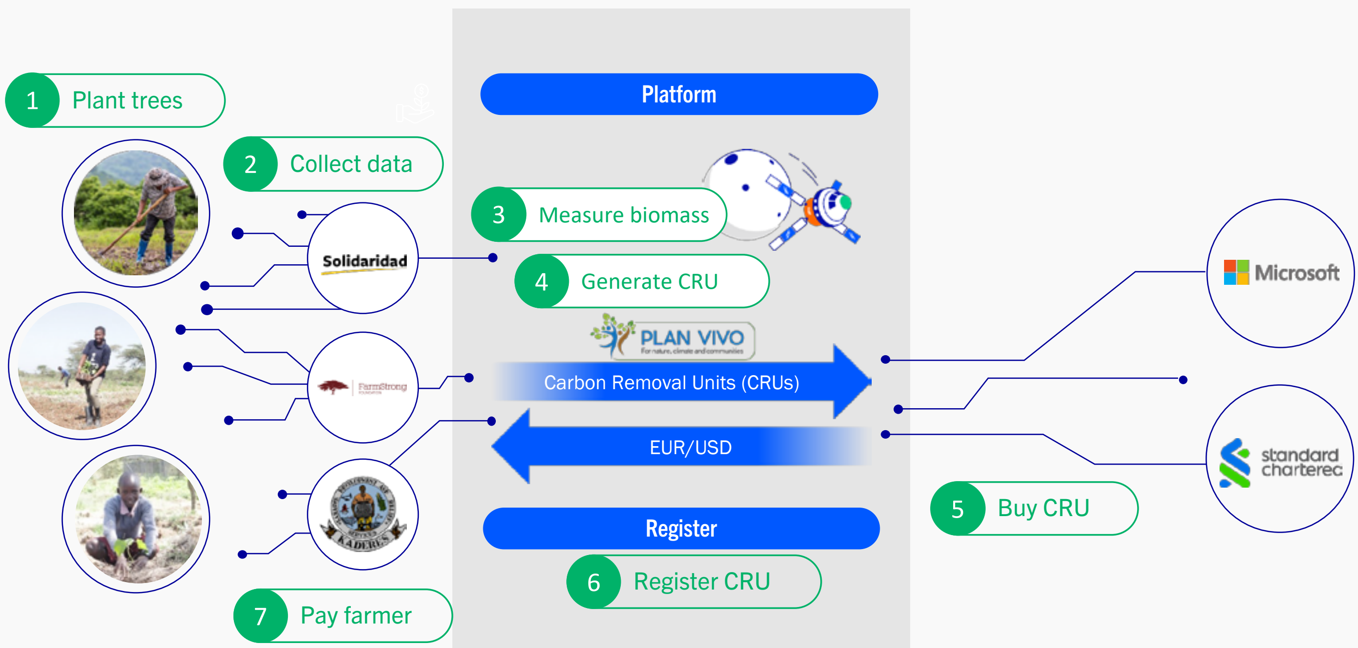
PART 5
CASE STUDY: ACORN

Acorn – Agroforestry CRUs[5] for the Organic Restoration of Nature – is an agroforestry program that unlocks the international voluntary carbon market for smallholder farmers. Acorn's mission is to combat climate change, land degradation and food insecurity with an inclusive agroforestry solution. This solution balances competing land use demands in a way that benefits both human well-being and the environment. This means land use that has a positive impact on food supply and livelihoods, the economy, environmental restoration, climate targets and development goals.

To do this, Acorn has built a global, transparent, and technology-enabled marketplace for carbon sequestration. This marketplace provides entry to the international carbon market for smallholder farmers who are realizing agroforestry activities for carbon sequestration through biomass growth, predominantly through trees, which is measured with the help of satellite monitoring. Acorn supports the initiation and development of these agroforestry activities and facilitates the subsequent trade of the so-called carbon removal units (CRUs) that are generated from the sequestered carbon. At least 80% or more of the proceeds from CRU sales should accrue to participants as either cash payments or individual in-kind contributions. As such, the program:

- is accessible for smallholder farmers on a large scale;
- ensures suitable agroforestry systems which capture sufficient carbon and provide decent income to smallholder farmers;
- embraces innovative technologies; and
- encourages the sale of ex-post carbon removal units.

FIGURE 3. OVERVIEW ACORN



[5] CRU: Carbon Removal Unit.

PART 6
HURDLES TO ADOPTION

6.1 Education

Successful adoption of carbon farming requires in many cases a shift in mindset with the farmers. Traditionally, farmers have been farming *from* the land, whereas carbon farming requires a level of cooperation *with* the land. The harvest is not taken from the soils, it is stored in the soils. For farmers the shift in value creation is new, and often takes time to get used to. No tillage might look strange to neighbouring farmers who are ploughing their land; cover crops in an orchard could look messy to the untrained eye. And these are just examples of simple changes farmers can make to sequester more carbon on their land.

Mono-culture farmers have to be risk-averse and conservative, because each year they have one harvest that has to support them for a full year. Being comfortable with the idea of changing farming practices, which have often been taught from one generation to the next, requires significant training and education.

Farmers often receive their training from family members, their local community, governmental extension officers or input providers visiting their clients. Exposure to innovative farming practices is limited for those farmers who are not actively looking for it. Especially in developing countries, access to knowledge is a privilege often not reserved for smallholder farmers.

In many cases indigenous knowledge is lost, while indigenous farming practices are often much more climate adapted and extreme weather resilient.

This also shows that local involvement is crucial for carbon farming practices to succeed: they need to include local species and practices that are suited for the climatic circumstances, but most importantly they need to be species and practices that are known by the community, to ensure the best treatment and care of the carbon farming intervention.

6.2 Access to finance

Without proper care and fit with local circumstances, investment made into carbon farming interventions will fail. These investments can range from education, training and mindset shifting, to significant investments into tree seedlings, irrigation systems or even biofertilizer or biochar installations. These interventions often do not come cheap, which is a significant hurdle to adoption of carbon farming practices.

Access to finance is often limited for farmers. Larger farmers who do have access to loans are pressured with short repayment cycles. These short repayment cycles push farmers into the corner of annual crops, combined with heavy fertilizer usage to improve their yields short term. This short-term benefits cycle is not conducive to decarbonization, because of the high emissions associated with fertilizer use, but it is the only option available for many farmers. Financial institutes therefore hold a shared responsibility for carbon farming adoption since the investments do not repay themselves within one harvest cycle.

The risks associated with investing in smallholder farmers are so high that interest rates are high, if the loans are given at all. The risks are high for smallholders because their source of income is often limited, untraceable and very susceptible to the effects of climate change. But what is worse, smallholders often need to decide between repaying their loans or paying their children's education and paying for their sustenance. It needs no further explanation that smallholders live under very high financial pressure, only emphasizing their need for access to finance. For smallholder farmers often the only source of investments is from grants and donor funding. This donor money is in short supply, and often does not reach those farmers with the biggest needs for it.

Again, carbon farming forces us to take a longer-term perspective, not just in the investments made by farmers, but also by financers. Blended finance can often offer a solution here when different risk appetites and repayment periods are grouped together. This means that the donor funding can unlock access to larger sums of money, if the donor funding can carry the first losses because it requires no repayment.

6.3 Payments for ecosystem services

No matter the finance construction, if large-scale adoption of carbon farming is the goal, then the farmers who do the work need to be paid for their ecosystem services to make the transition viable in the short term. Especially for the carbon farming interventions that require more labour or land-management practices, payments for ecosystem services (PES) can play a key role in enabling the transition to carbon farming. PES can provide the bridging income when the agroforestry system is still growing, they can offer repayment for the loans taken out for the biofertilizer installation, and they can add to smallholder income to alleviate the pressure on agricultural yields for their source of income.

PES are a tool to relocate finance from those who are putting pressure on our planet to those most affected by the resulting climate change, and their efforts to mitigate this impact. Carbon farmers are doing exactly that, saving both our future harvests, and contributing to lowering our global temperature rise to 1.5 °C.

Carbon farming is called carbon farming not because farmers are solely focussed on cultivating carbon, but because the carbon market is the most developed market for ecosystem services. Inherent in the name of the intervention is its need for financial solutions beyond our traditional structures.

6.4 Organization and expertise

For successful deployment of a carbon reduction ecosystem, local competence centres should be developed with support of international coordination. These local competence centres should be organized from a national or subnational level to serve as a hub for local stakeholders such as landowners, farmer cooperations, ICT organizations, universities, value chain partners, certification investors or financing institutions and local governments, and so on.

Linked to a global organization, such a global competence network will be able to share knowledge and assist each individual local competence centre where needed to improve the performance in general and in particular in the deployment and efficient operation of climate-smart agriculture.

Each local competence centre is to serve as the gateway for and to the carbon farmers in a local, geographic region, developing and deploying applications with local stakeholders to optimize yield and biomass for sustainable carbon emission intake.

In the nearby future, the global competence centre network organization could deploy its own credit infrastructure. Farmers need to see and experience short and long-time benefits; local competence centres have access to farmers and understand the local needs of farmers. By fulfilling local (short-term) needs, farmers will be more willing to change their way of working towards an optimal sustainable carbon farming system and experience all long-term benefits.

6.4.1 A case for local competence centres: AIC

The Agri Intelligence Centre B.V. (AIC) is an example of the establishing of a network of local competence centres. AIC centres will be established bottom-up locally under international coordination. Current plans aim to access farmers in South Africa, Kenia, Egypt, Nigeria, Cameroon, Bangladesh, Indonesia, and India. Carbon emission credit collection will be a complementary product line for AIC, and due to the standardized approach, the deployment in other countries will be more predictable. To establish its international platform with local competence centres, each local AIC works according to the following roadmap:

1. Design investment proposal to guard local participation.
2. Land development programme to optimize the region for Carbon Reduction Farming, including research for biodiversity and enquiry into local market needs.
3. Integrated investment proposal plus business case for local competence centre.
4. Go/no go decision.
5. Once investments are approved, set up organization and partnerships with local stakeholders (government/agri-cooperations/ICT organizations/investors).
6. Local development (in partnership with global stakeholders) of solutions to address local needs.
7. Implement solutions for climate-smart agriculture (such as carbon farming) for smallholder farmers; install a base and start education program to roll out and leverage implementation programme.
8. Expand scope of local competence centre, such as applications, trading platform, insurance, earth observation, and so on.

PART 7
CARBON MARKETS

7.1 History of the carbon market

In 2003 the Kyoto protocol was designed, forming the foundations for the Clean Development Mechanism (CDM). This was the first version of a functioning PES market, but it is not the last iteration. After some initial kinks that needed to be smoothened out, the Paris Agreement of 2016 redesigned the original carbon trading.

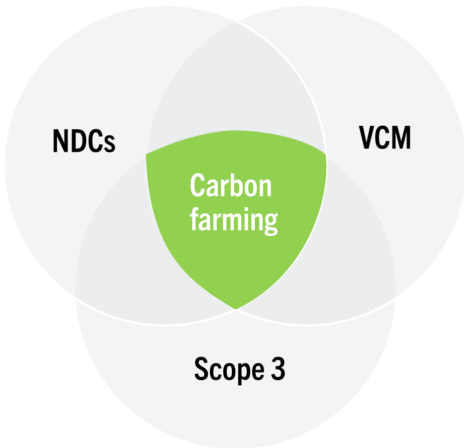
This history results in our current day Nationally Determined Contributions (NDCs), which state a country's ambitions to lower its emissions, and the resulting plans to do so for each relevant sector of industry. Each country sets its own goals, but there are a few general trends, most notably the move towards including agriculture in the NDCs. This has the potential to increase the focus on carbon farming.

Next to the national carbon trading markets, there is also the Voluntary Carbon Market (VCM), where companies and consumers can voluntarily buy carbon credits to offset their emissions.

A third route to value carbon farming is through the lens of carbon neutral products, where farmers are the scope 3 suppliers of companies. Whenever products are considered CO2 neutral, their entire supply chain needs to be carbon neutral, according to GHG protocol[6] accounting standards.

Carbon farming is incorporated in all three carbon markets, so the risks of double counting and double claiming of carbon emissions and reductions is real. Avoiding double claiming and losing integrity of the carbon markets requires education, transparency, and consistency between all three markets.

FIGURE 4. OVERLAP CARBON MARKETS



7.2 Carbon quantification

In order to receive payments for ecosystem services in the carbon market, farmers need to quantify their carbon emission reduction and carbon sequestration. The unit of one carbon credit is always 1000 kg CO2 equivalent, which means that all GHG-related efforts on the farm can be quantified. There is a system to translate N-based fertilizers to their CO2 equivalent and calculate the impact of methane on the climate using the metric of CO2.

Depending on the type of intervention, there are various standards that quantify carbon farming impacts. For removals the above-ground removals require a very different approach from the soil organic carbon quantification, while reduction of farm-based emissions follow another protocol of

[6] Source: https://ghgprotocol.org.

quantification. The table below shows the proven methods and standards for carbon quantification for farmers:

AGROFORESTRY Acorn	**SOIL CARBON** FAO GSOC MRV Protocol
BIOCHAR VCS	**REDUCTION** FAO TAPE

FIGURE 5. **OVERVIEW CARBON STANDARDS**

Carbon accounting can become very complex when the aforementioned different standards come into play. The different standards in *figure 5* all follow a high standard of transparency and traceability, but this is not always the case in the different carbon markets. Quantifying a country's NDCs is often much coarser than the quantification of a carbon credit (see table below). To add to the chaos, scope 3 measurements follow a completely different approach to allocating carbon: they see the carbon in the context of the supply chain of a product and therefore connect the carbon emissions and removals to the produce from the land.

An example: the carbon sequestered on one plot of coffee agroforestry could be accounted for four times, if not corrected for double claiming. The scenario that follows is a simplified version of real situations we have faced multiple times while working with smallholder farmers on climate resilient and regenerative agroforestry practices:

- **VCM**: If software company A wants to offset their emissions, they can use carbon credits to compensate. Company A can buy credits from smallholders who are sequestering carbon through agroforestry and who are connected to the carbon market by an NGO. Currently these farmers are paid roughly EUR 20 per tCO2e in the VCM.
- **Scope 3 reduction**: Simultaneously coffee trader B, who buys their coffee from these same smallholders, could count their carbon sequestration through agroforestry as a removal in the coffee's supply chain.
- **Scope 3 reduction**: These smallholders also produce oranges from the shade trees, which are sold to Fruit Trader C, who counts the same sequestered carbon from agroforestry in their scope 3 accounting.
- **NDCs**: The national government could attribute the adoption of agroforestry to their awareness campaigns and add the roughly estimated impact of the agroforestry to their NDC efforts, trading the excess CO2 removals with other countries through the Article 6 framework.

These different carbon accounting principles require stronger alignment and transparency, to make sure farmers are able to participate in these markets and are paid for their ecosystem services.

	NDCS	VCM	SCOPE 3
Project scale	National	Local	Supply chain
Carbon quantification	Rough estimates	Very detailed	Assumption based
Carbon accounting	Landscape level	Plot level	Produce level

7.3 Carbon monetization

To simplify the minefield of carbon accounting standards for carbon farming, the decision tree below illustrates the different routes a farmer can take to monetize their carbon farming efforts. Keep in mind that payments for ecosystem services are not equal between all options because the different markets follow different market mechanisms.

FIGURE 6. DECISION TREE

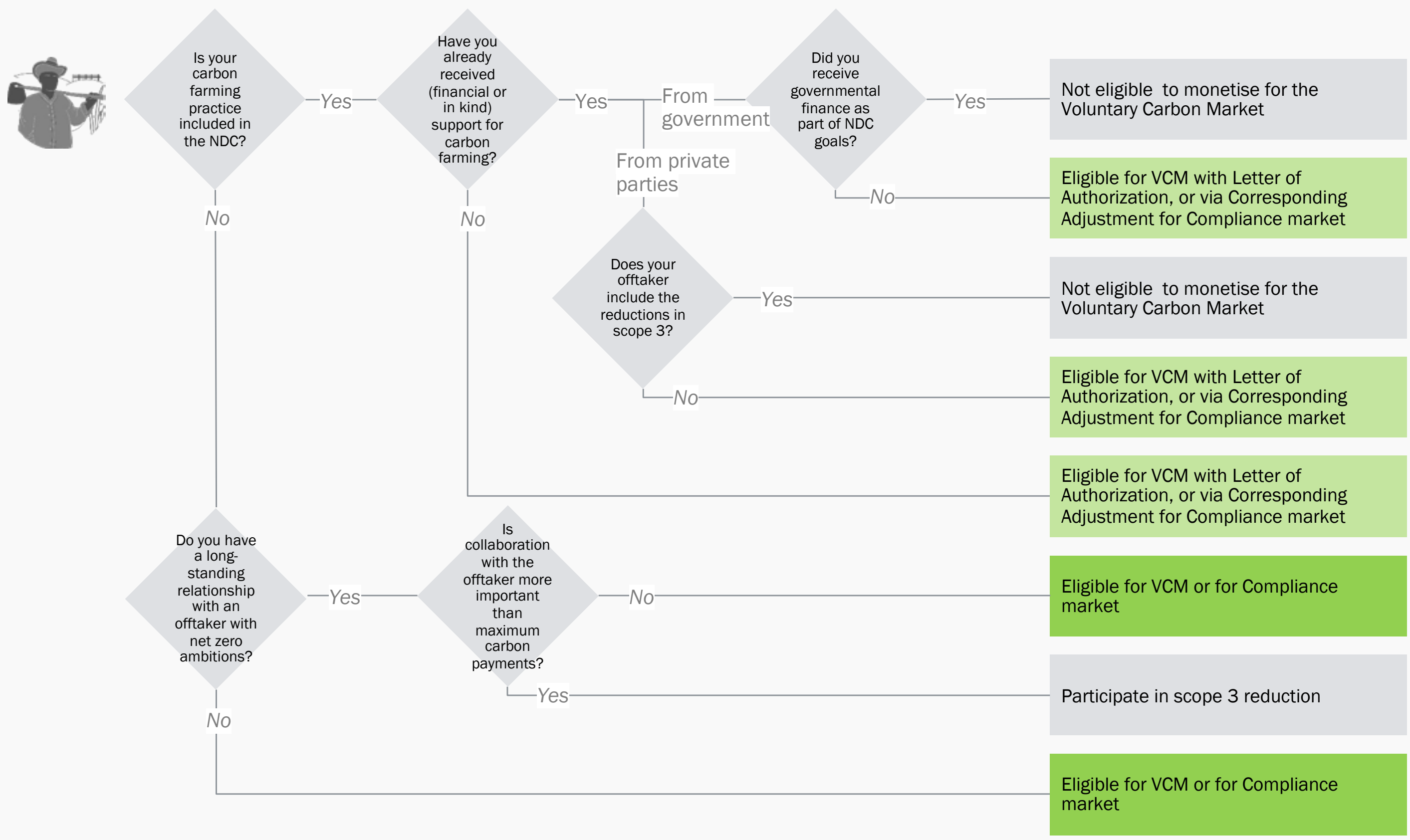
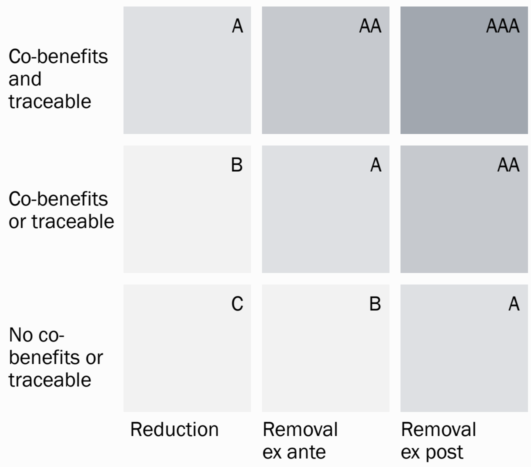


FIGURE 7. CARBON CREDIT QUALITY



Within the carbon credit category, there are different levels of quality. The higher the quality level, the higher the price in the market. And as explained, carbon farming holds the potential to score very high in the Y-axis.

7.4 Climate equity

What becomes clear from the earlier shown decision tree is the different carbon monetization routes generate different income streams for farmers. It is crucial that farmers know their options before committing to one system, due to the risk of lock-in. The VCM requires additionality as a basic principle, meaning that the carbon intervention should not have existed without the carbon finance. This means that after a farmer has adopted carbon farming practices using scope 3 investments, they cannot transition to selling credits in the VCM.

Scope 3 has traditionally not paid their farmers for their carbon farming efforts, while the VCM does pay them for the exact same labour. Farmers who are uneducated on this topic, and especially smallholder farmers, run the risk of being locked into a scope 3 emission reduction agreement, barring them from monetizing their carbon farming activities.

If we want to achieve climate equity, all carbon farmers should be paid fairly for their ecosystem services, and the first step to achieving this goal is education. Not just of farmers, but also of their offtakers, protocol writers, governments, carbon credit buyers and most importantly the general public. Carbon farming has the potential to significantly alter the course of climate change, food insecurity and land degradation, but only if farmers are supported in their indispensable work.

PART 8
FIVE ACTIONS PER ACTOR TO START

Government

1. Facilitate full function of carbon markets to the benefit of the farmer.
2. Develop large scale programs.
3. Leverage synergies with other programs e.g. landscape level, rural strategies, or land mapping.
4. Develop national food security strategies that work carbon farming.
5. Support farmers and farmer organizations.

Large scale farmers

1. Decide which carbon farming interventions work best on your farm.
2. Develop a business case with both food produce and other income (e.g. carbon).
3. Encourage species and genetic diversity.
4. Apply farmer-to-farmer dissemination.
5. Cherish the land.

Project developers

1. Develop farmer-centric, large-scale interventions.
2. Ensure long term technical assistance.
3. Determine a just mechanism to reward farmers.
4. Establish a well-functioning project council.
5. Promote new business and employment opportunities.

Financers

1. Develop effective multiyear financing mechanisms incl. grace periods.
2. Take holistic business case into consideration.
3. Include other KPIs in financing (e.g. biodiversity).
4. Value land based on (soil) quality.
5. Facilitate land acquisitions to prevent decreasing land size.

PART 9
NEXT STEPS

The initial focus will be on smallholder farmers in Africa that implement agroforestry schemes. Four lighthouse projects in Africa will be selected and gradually be expanded to ensure full coverage.

FIGURE 8. INITIAL SCOPE

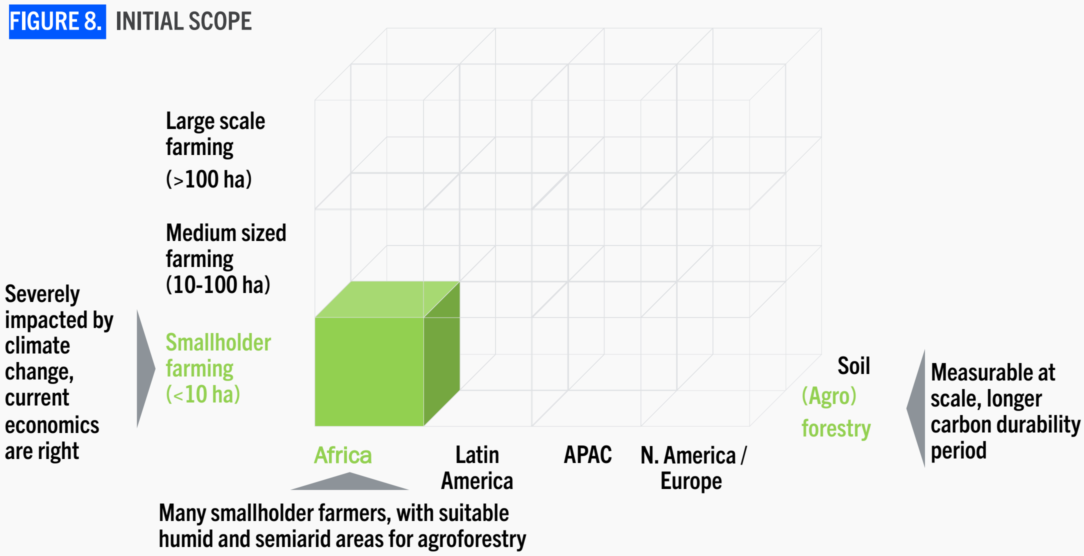
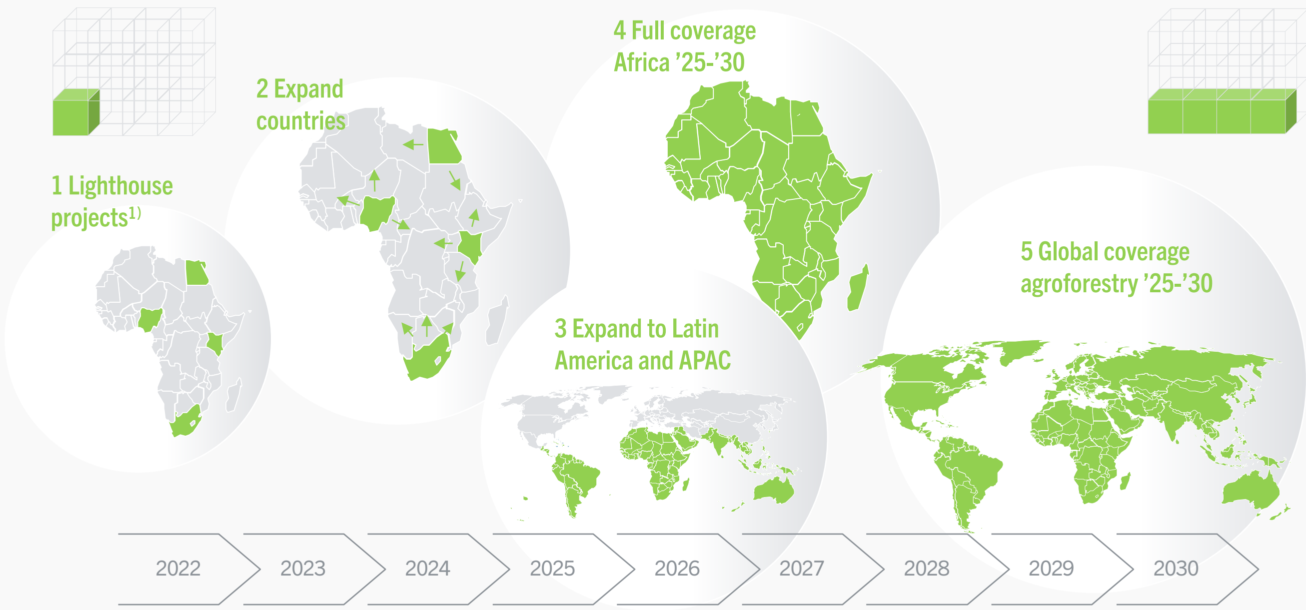


FIGURE 9. GLOBAL ROLL-OUT



1) Exact countries to be defined

PART 10
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