

2050



THE  
FASHION  
PACT

White paper  
Comparative analysis of GHG accounting  
approaches and implications for the cotton  
value chain

*Volume 1 in the series - Unlock White Papers*



## Context - what is the Unlock Programme?

The global fashion industry is estimated to produce around 4% of global Greenhouse Gas emissions each year<sup>1</sup> - equivalent to the combined emissions of France, Germany and the UK. 38% of these emissions come from raw material production, of which cotton makes up 27% by volume.<sup>2</sup>

The Unlock Programme has been developed to 'unlock' barriers to decarbonising cotton and raw materials production, and aims to provide a game-changing catalyst for increased adoption of lower climate impact and regenerative farming practices. Unlock was created by The Fashion Pact and 2050, and will be piloted until Q2 2024 in collaboration with some of the world's leading technical partners as well as 25 industry-leading fashion brands.

It does this by supporting farmers to identify and implement practice changes, quantifying the actual GHG impact (and other impacts) of these changing practices, and using these GHG impacts to issue additional, outcomes-based financial incentives to farmers called 'Unlock Units'.

**Unlock is designed to address key industry challenges**, including:

- Quantifying on-farm GHG benefits from better practices - as well as quantifying benefits for biodiversity, water, soil and farmer livelihoods.
- Providing early additional incentives to farmers to apply improved practices and technologies - ultimately increasing farmer resilience and making more sustainable cotton available in the market.
- Supporting brands in connecting to farmers and making credible scope 3 claims for cotton.

The Unlock Programme is working with farmers in a variety of contexts, including large and smallholder farmers in both India and the USA. This provides the opportunity to test different approaches to GHG quantification and accounting across a range of different farmer archetypes, helping identify challenges and benefits from each approach. The pilot phase also includes testing of both intervention and inventory accounting methods and the relevant systems required to support them, as well as partnering and testing with a range of implementation partners and data partners. This broad testing and

<sup>1</sup> McKinsey and GFA, Fashion on Climate

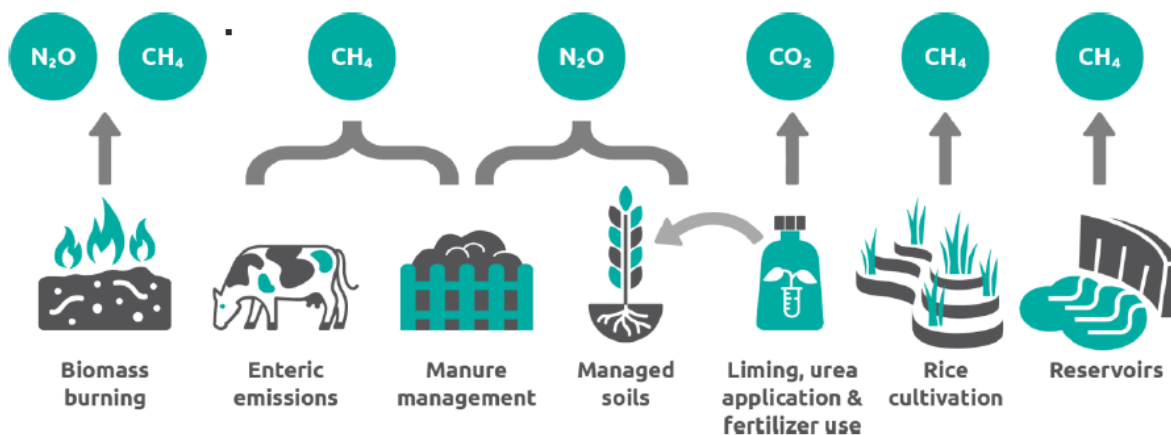
<sup>2</sup> WRI and Aii, Roadmap to Net Zero

collaboration is designed to provide as much insight as possible into the process of applying these solutions within the cotton value chain, and as a case study to other organisations looking to design solutions that work in commodity supply chains, Global South locations or with smallholder farmers.

The Unlock Programme not only aims to quantify the GHG outcomes at field level, but also aims to measure co-benefits at farm level, including soil health, water impacts, biodiversity, and livelihood benefits for farmers.

## Context - what type of emissions are in scope for agriculture?

Carbon (and soil organic carbon) is a primary driver of GHG emissions reductions and removals in agriculture. However, multiple other GHGs are relevant to agricultural systems.



*Land management non- $CO_2$  emissions* are illustrated in figure 8.4 and include:

- $CH_4$  and  $N_2O$  emissions from livestock, including emissions from enteric methane fermentation and manure management
- Non-biogenic  $CO_2$  and  $N_2O$  emissions from agricultural soils and inputs
- $CH_4$  and  $N_2O$  emissions from biomass burning and fires
- $CH_4$  emissions from rice production, reservoirs and other flooded lands
- Other  $CH_4$ ,  $N_2O$ , non-biogenic  $CO_2$ , hydrofluorocarbons (HFCs), and perfluorocarbons (PCFs) emissions, including emissions from on-site fuel and energy consumption, fuel combustion, air-conditioning and refrigerant use, on-site waste or wastewater management and indirect emissions from purchased energy

3

There are multiple ways to quantify GHG emissions within agriculture. Some examples are included below.

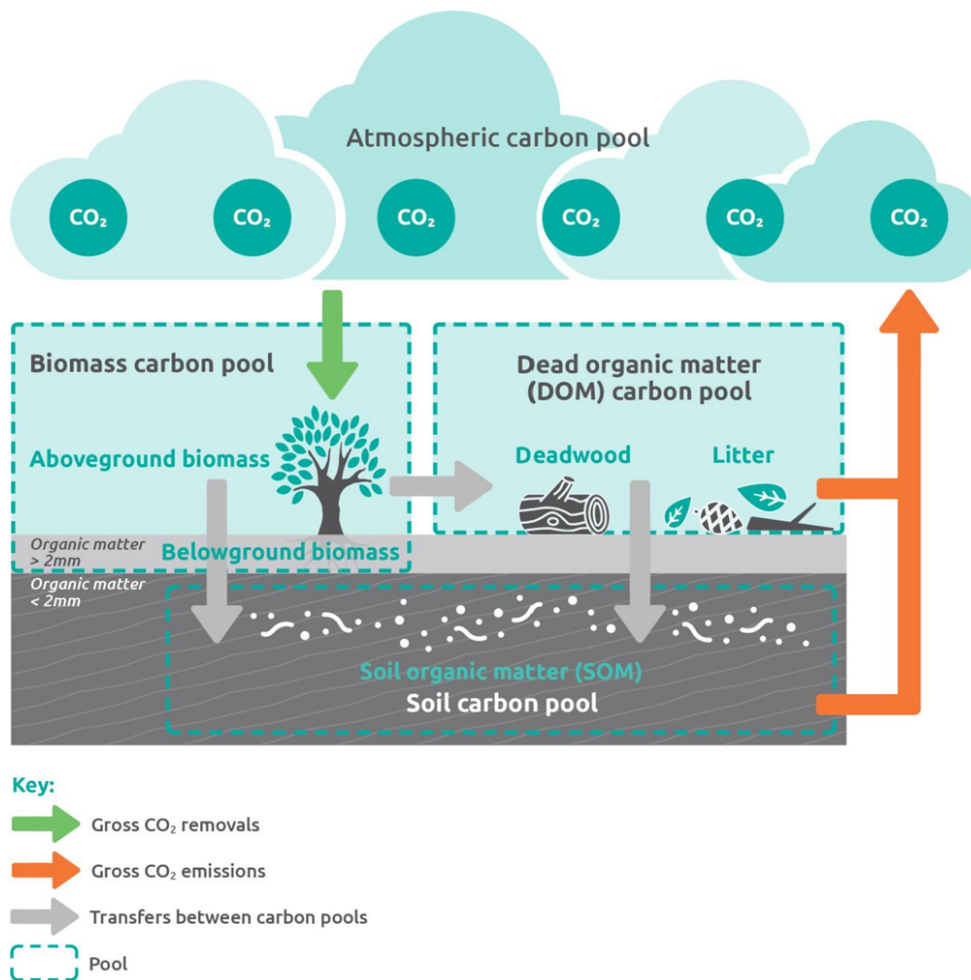
<sup>3</sup> Land Sector and Removals Guidance, Draft for Pilot Testing and Review (September 2022), Greenhouse Gas Protocol

Type of emissions	Calculation method	Relevant activities	Type of impact
Land use change	Calculations of changes in biomass and carbon sinks due to conversion (typically conversion from primary landscape to agricultural production and a subsequent loss of biomass and carbon stocks)	<ul style="list-style-type: none"> <li>● Clearing of natural landscapes for agricultural production (forest, grasslands, wetlands, other natural ecosystems)</li> <li>● Landscape restoration or set-aside to allow for some species and biomass to be regained</li> </ul>	Removal/emission/reversal
Embodied emissions within field level inputs	Volumes of field level inputs multiplied by relevant GHG coefficients	<ul style="list-style-type: none"> <li>● Fuel or energy use for irrigation, land management and tillage, harvest.</li> <li>● Use of chemicals and field inputs including fertilisers, pesticides, fungicides and insecticides.</li> <li>● Residue burning</li> <li>● Embodied emissions from use of animals in production systems (e.g., for ploughing)</li> </ul>	Reduction/emission
Soil emissions	Dynamic soil modelling of direct and indirect emissions (such as methane and nitrates) and/or primary soil testing	<ul style="list-style-type: none"> <li>● Crop rotation and crop planning including cover cropping and residue management</li> <li>● Tillage and other land management activities</li> <li>● Use of inputs that affect soil emissions such as fertilisers</li> </ul>	Reduction/emission
Agricultural soil carbon sequestration	Dynamic soil modelling of soil organic carbon stocks and emissions and/or primary soil testing	<ul style="list-style-type: none"> <li>● Crop rotation and crop planning including cover cropping and residue management</li> <li>● Tillage and other land management activities</li> <li>● Use of inputs that affect soil emissions such as fertilisers</li> <li>● Other practices such as application of biochar</li> </ul>	Removal/emission/reversal

## What are reductions and removals?

GHG reductions are where GHG emissions are demonstrated to be lower for the relevant quantification period. For example, a farmer uses less fuel this year than they did last year. The overall volume of emissions being emitted has been reduced.

Removals are where GHGs (mostly CO<sub>2</sub>) are actively taken out of the atmosphere and 'sequestered' or locked into soil, biomass, other ecosystems such as oceans, or even artificial stores. A specific volume of GHGs that were previously in the atmosphere has now been removed.



4

<sup>4</sup> Land Sector and Removals Guidance, Draft for Pilot Testing and Review (September 2022), Greenhouse Gas Protocol

*“Carbon enters land-based carbon pools through gross CO<sub>2</sub> removals associated with photosynthesis by plants or trees, that stores carbon in the biomass carbon pool. Carbon can be transferred between pools such as the transfer of live biomass to dead organic matter carbon, dead organic matter to soil carbon or below ground biomass to soil carbon. All land-based carbon pools can contribute to gross CO<sub>2</sub> emissions through respiration, decomposition or combustion of stored carbon”<sup>5</sup>*

Where removals occur, they can also be reversed, as shown in the orange line in the diagram above. Where this happens, the resulting emission of carbon to the atmosphere can be referred to either as an emission (if the carbon pool is still being reported within the supply chain of the reporting company) or as a reversal (if the carbon pool is no longer being reported within the supply chain of the reporting company).

#### Accounting requirement

Companies **shall** account for and report net carbon stock losses of previously reported removals in the year the losses occur, as either:

- Net CO<sub>2</sub> emissions, if the carbon pools are part of the GHG inventory boundary in the reporting year, or
- Reversals, if the carbon pools are no longer in the GHG inventory boundary in the reporting year.

If companies lose the ability to monitor carbon stocks associated with previously reported removals, companies **shall** assume previously reported removals are emitted and report reversals.

6

<sup>5</sup> Land Sector and Removals Guidance, Draft for Pilot Testing and Review (September 2022), Greenhouse Gas Protocol

<sup>6</sup> Land Sector and Removals Guidance, Draft for Pilot Testing and Review (September 2022), Greenhouse Gas Protocol

## Intervention accounting - how does it work?

Intervention accounting is used to estimate GHG impacts of actions relative to counterfactual baseline scenarios or other performance standards.

Intervention accounting has its origins in the offset market, where any GHG reduction activity claimed as an offset needed to demonstrate the reduction in emissions had been 'caused' against a credible baseline. This approach of demonstrating a reduction against a baseline has carried into the 'intervention' based approach to quantifying and claiming activities within a company's own supply chain.

### **Key features of Intervention Accounting**

There are many types and approaches to GHG intervention accounting. For the purposes of the Unlock pilot, and the nature of the scope 3 supply chain claims being supported, the intervention accounting approach being used is the Value Chain Interventions Guidance. The key features of this guidance include a supply shed approach to traceability, and strong requirements for causality and historical data to create a baseline.

### **The supply shed approach to traceability**

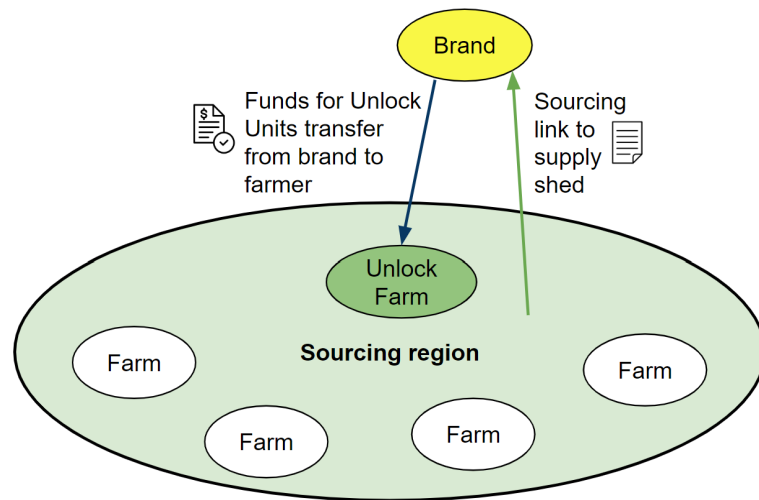
There are multiple potential approaches to traceability for the purpose of claiming GHG benefits within a company's scope 3 supply chain. The diagram below from the Draft Land Sector and Removals Guidance illustrates the different levels of precision in each of these levels of traceability.

The VCI guidance permits scope 3 claims to be made based on a high level of data specificity (primary data is available from field level in both the intervention and inventory approaches being tested) and a 'supply shed' approach to traceability. According to the VCI, "A supply Shed is a group of suppliers in a specifically defined geography and/or market (e.g., at a national or sub-national level) providing similar goods and services that can be demonstrated to be associated with the company's supply chain. The boundaries of a Supply Shed may be defined economically, for example a group of suppliers providing equivalent goods and services that can be demonstrated to be within the company's supply chain and physically, for example a group of suppliers/interventions in a specific catchment area. The appropriateness of each may depend on the nature of the intervention."

For the purposes of the Unlock Pilot, the proposed supply sheds have been determined by 2 key factors - country of origin, and the function of the product (for cotton this is fibre length). Fibre lengths have been grouped into Upland cotton and Extra Long Staple



cotton - these specifications having a distinct pricing level in the market and therefore determining a different position in the market. This approach is tailored by Unlock to the specifics of the information about the cotton commodity market, but different versions of the supply shed approach are taken by other initiatives under the VCI programme.



The supply shed approach makes it simpler to connect reporting companies (in this case fashion and textile brands) to the relevant farmers within the programme. There is a high level of complexity in the supply chain for cotton, with multiple traders, processors and then a series of clothing suppliers in between the farmer and the brand using the cotton. A supply shed approach would significantly increase the speed by which both reporting companies and participating farmers can be included into the programme, compared to other versions of traceability (see the section below).

### **Causality requirements and double counting prevention**

Due to the nature of an intervention accounting method, it is important to establish that the change between the baseline and the new emissions was also caused by the organisation issuing the potential claim. This means that there should be evidence that the actor making the change was directly caused to do so by the relevant entity, such as contracts, evidence of training taking place, or enrollment into a specific programme. Impacts can only be claimed once this causality evidence has been established, and cannot be applied retrospectively to historical changes made without this evidence. This means that farmers who have already made significant changes will have fewer activities for which they can show causality than farmers who have not yet made significant changes.

It is also very important to ensure that impact data is not double counted within the system - for example that impact claims are not made by Unlock and then separately claimed through another channel such as alternative impact programmes. To mitigate against this risk, Unlock has engaged all partners and farmers involved to ask them to agree that no other entity will make claims to impact reduction using the same data, crop and cropping period used by Unlock. It also means that where any potential double

counting could occur (for example, where farmers certified to a standard with a global LCA coefficient are participating in Unlock and therefore the LCA claim could be being made about the farmer at the same time as the Unlock claim), a protocol has been put in place to ensure that double counting is prevented. This includes enrolling only non-certified farms for the pilot, and asking that any brand making Unlock claims does not use any global LCA claims for the relevant volumes of cotton.

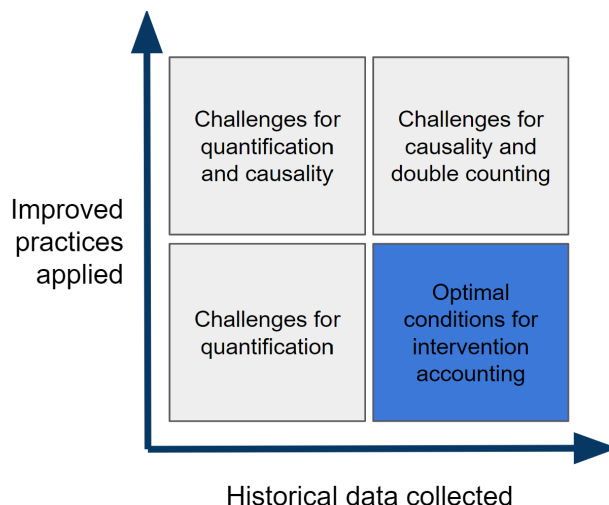
### **Historical data requirements**

Depending on the type of GHG quantification being carried out, there may be some significant requirements around historical data involved in the intervention approach, in order to establish a baseline against which to demonstrate change. Most actors will need at least 3 years of historical practice or other relevant quantification data - particularly if soil models are being used. When farmers do not have this degree of historical primary data to set a baseline, a system can be proposed that leverages the use of robust and peer reviewed proxy data, but this approach must be specifically approved by VCI.

### **Challenges experienced when applying the VCI intervention accounting approach to US and Indian cotton farmers**

#### **Causality, double counting and historical data requirements for Global South farmers**

The causality requirements, double counting prevention requirements and the strict requirements for historical primary data from farmers in the Global South have combined to create some unexpected outcomes in terms of which farmers could be enrolled in the Unlock Pilot. Many farmers in the Global South are not routinely monitoring the farming practices and inputs that would be required to create historical baselines for quantification under an intervention based approach. Therefore, for a farmer that is most attractive in terms of potential causality and benefit from intervention (those who have been farming conventionally up until engagement with Unlock), their lack of historical data collection makes it almost impossible to enrol them into the programme. They would have to wait many years without financial reward (and without taking any improved actions) in order to establish the baseline to then build upon with their improved practices.



Where farmers have been collecting historical data in the Global South, this is largely because they have already been involved in programmes and initiatives that could potentially create challenges with causality and with double counting. A farmer that is already certified to a scheme that has a global LCA coefficient is harder to manage in terms of causality (much stronger evidence is required to show that they are taking additional steps to the ones they would have taken already, and the potential measured benefit of their caused actions is reduced because they have already taken action, see below for details). They are also harder to manage in terms of double counting risk (they are either excluded from the pilot, or special protocols are required to ensure that a brand does not make a claim against them based on their certification in their accounting approach).

### **Causality and existing programmes/leading farmers**

A challenge that is not only relevant for Global South companies but also for those in countries like the US, is the difficulty of establishing causality or any significant claims for those who have already taken steps to reduce their impacts in the past. If a farmer has been working on reducing emissions through efficiency in their field level inputs, has been practising good crop management, and has reduced their tillage, the number of meaningful additional actions they can take in addition to these and see benefits for under an intervention based approach is low. Whether they have taken these actions through participation in a programme or certification scheme, or through their own initiative, any farmer who is already farming in a low impact and regenerative way will struggle to gain any recognition for their activities under this approach.

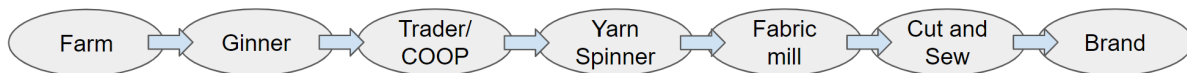
Given the challenges we see in the section above, there are major groups of farmers excluded from quantification and claims - either because they have not been collecting baseline data due to lack of systems and incentives to do so, or because they have

been too proactive and taken action already. Only those cotton farmers that have been taking meticulous recordings of their inputs, practices, crop management plans and all relevant on-farm events BUT have not been taking much action to drive efficiency or improved practices will see strong benefit from this system. This ‘sweet spot’ for causality is one that would only pertain for a minority of cotton farmers around the world.

One final element in understanding causality dynamics, is that for some potential farmers and Implementing Partners in Unlock, contracts with farming groups for cotton sourcing are only put into place later in the growing season, when most relevant activities have already been completed. This would provide a significant barrier to demonstrating causality for farmers in those programmes.

### Barriers to refining the supply shed approach

The dynamics of the cotton commodity market place some limitations on what can be achieved in terms of defining a ‘supply shed’ approach. The first barrier to using this approach is that a large number of companies buying cotton do not have a clear sense even of its country of origin. Some cotton comes with a certificate of origin to certain points in the supply chain, but it is by no means certain that specific cotton sourced through a series of suppliers and traders/processors will have identifiable country level information. A much simplified version of the supply chain is shown below, but in many cases there could be an additional trader between each transaction, sub contracting, or more complex processes that require further stages.



Similarly it can be challenging for some brands to identify the functional profile of cotton. The fibre length is a good way to segment the market, with some brands specifying specific fibre length range to their suppliers as a production standard, whilst others are specifically paying for extra long staple fibres. Yarn spinners blend multiple qualities and origins in order to achieve the desired yarn quality characteristics. In absence of these elements, it is clear that cotton will be upland cotton, as extra long staple fibres will never be shipped in place of shorter, cheaper ones.

Many brands can identify at least some country level information about specific volumes of their sourcing, and therefore the current approach during the pilot provides a functional solution. However, either when Unlock aims to scale to many more farmers and cotton volumes, or when supply shed requirements are strengthened to require more granular information, there will be barriers to having sufficient information to support high volumes of cotton being linked to supply sheds, or to having more specific

information beyond country level.

The supply shed model is still much more scalable than the alternative (see below) in terms of costs and inclusivity to a range of farmers. But it is important to understand that reaching the stage where brands have consistent information on country of origin and fibre length for significant cotton volumes is already ambitious - and systems that look for greater traceability (links to specific states/counties, 'supply chain engineering' solutions as we see below, or even full segregated chain of custody) are likely to struggle to scale in this sector.

### **Alignment with LSRG and removals claims**

One final challenge that Unlock has experienced in applying an intervention accounting approach is that it is not yet aligned with the inventory approach to removals set out in the draft Land Sector and Removals Guidance (LSRG) that has been published under the Greenhouse Gas Protocol. Initiatives such as SBTi require alignment to the LSRG as part of their requirements on removals claims, so any company wishing to make removals claims under SBTi must do so in line with the LSRG requirements. This makes it very challenging to claim removals under available intervention approaches, and companies must wait for the LSRG guidance updates and the subsequent adjustments made by those managing the programmes such as VCI which are intervention based before these approaches are compatible with removals claims.

VCI notes in their Accounting and Reporting Guidance that "Companies should be aware that the Greenhouse Gas Protocol is, at the time of writing, developing standards and guidance for accounting for land-based emissions and removals. These new approaches are likely to include further requirements and clarification concerning several key aspects, including the terms and definitions of this guidance.". We therefore await further updates to VCI guidance when LSRG also finalises its guidance.

## Inventory accounting - how does it work?

Inventory accounting provides a complete assessment of the annual emissions from sources (and removals by sinks, if applicable) within the reporting entity’s inventory boundary.

### Key features of Inventory Accounting

There are many types and approaches to GHG inventory accounting. Due to the nature of the scope 3 supply chain claims being tested within the Unlock Pilot, the inventory accounting approach being used is the Greenhouse Gas Protocol Land Sector and Removals Guidance Draft. This guidance was designed to support companies to account for land sector emissions and to credibly calculate and account for CO2 removals within their own value chain. Since the guidance has a significant focus on removals, we will particularly explore the key features of the guidance that pertain to reductions and removals under a programme such as Unlock.

### Traceability to the land management unit or harvested area

	Spatial Boundary	Traceability	Data Specificity	Emissions Reporting	Removals Reporting
	<b>Jurisdiction</b>	Known subnational jurisdiction, country or political region (e.g. EU) of origin	Average national or regional secondary data for attributable managed lands in the jurisdiction	Least precise	No, requires more precise traceability and primary data
	<b>Sourcing Region</b>	Known first collection point or processing facility	Primary data on attributable managed lands in the sourcing region(s) or secondary data representative of average management for lands within the sourcing region(s)		Subject to pilot testing question #3
	<b>Land Management Unit</b>	Known land management units of origin (e.g. forest management unit, ranch or farm)	Primary data from producers for the specific land management unit(s)		Yes, if the company meets other removals requirements
	<b>Harvested area</b>	Known field or forest stand of origin	Primary data from producers for the specific harvested area(s)		Yes, if the company meets other removals requirements

7

According to the LSRG traceability requirements are that “companies shall account for and report removals only if the reporting company has traceability throughout the full CO2 removals pathway, including to the sink (where CO2 is transferred from the atmosphere to non-atmospheric pools), to the carbon pools where the carbon is stored,

<sup>7</sup> Land Sector and Removals Guidance, Draft for Pilot Testing and Review (September 2022), Greenhouse Gas Protocol

and to any intermediate processes if relevant”. However, this was an open question of the LSRG draft feedback process, and suggests that the updated LSRG guidance may adjust their traceability requirements towards accepting a sourcing region approach.

**Box 8.3 Open question #3 Traceability for land management removals**

Given the barriers to traceability in agriculture and forestry value chains, what level of physical traceability is appropriate to account for *Land management net CO<sub>2</sub> removals*?

1. Land management unit or more precise traceability: Companies **shall** account for and report scope 3 *Land management net CO<sub>2</sub> removals* only if they have physical traceability to the land management unit(s) where the carbon is stored. Net carbon stock changes can be accounted for at the land management unit-level or harvested area-level based on the physical traceability of products to relevant spatial scales.
2. Sourcing region with safeguards: Companies **shall** account for and report scope 3 *Land management net CO<sub>2</sub> removals* where they have physical traceability to either of the following:
  - Land management unit(s) where the carbon is stored. With such traceability net carbon stock changes can be accounted for at the land management unit-level or harvested area-level based on the physical traceability of products to relevant spatial scales.
  - First point of collection or processing facility. With such traceability net carbon stock changes can be accounted for at the sourcing region-level subject to appropriate safeguards (i.e., attributable working lands, capturing heterogeneity, conservative assumptions, consistent allocation, avoiding double counting and reversal accounting).

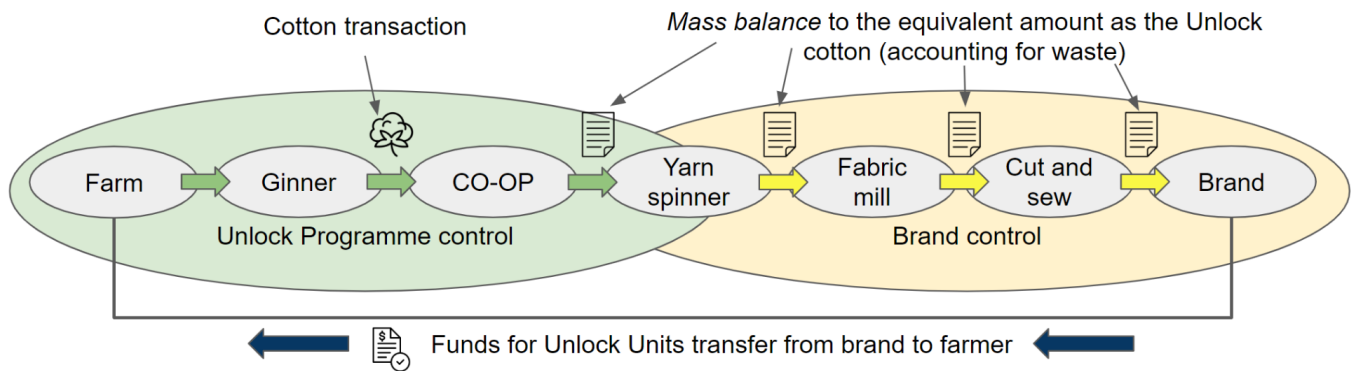
During pilot testing and review, we would like to gain practical experience with data/methods and understand the implications of the two options.

We invite pilot testers to pilot test different approaches in order to learn about the feasibility and implications of each approach to inform the final decision. In particular, we invite pilot testing companies to account for and report on net land carbon stock changes at both a land management unit-level and sourcing region-level following the safeguards below for land-based products and materials (where they have the necessary data to complete both analyses), to inform the decision in the final Guidance.

8

Unlock will have traceability in place between the farm and the brand making the Unlock Unit claim. Data collection will (as in both parts of the pilot) be happening at individual field and farm level, which provides highly accurate quantification using primary data from the specific harvested areas. Alongside this, fully segregated cotton will be traced to the first processing facility (cotton gin) and onward to the cooperative or other warehouse facility, and then a transaction certificate or other documented sale for the relevant volume of cotton for each transaction beyond that point. This will be ensured by identifying yarn spinners that the cooperatives and brands have in common.

<sup>8</sup> Land Sector and Removals Guidance, Draft for Pilot Testing and Review (September 2022), Greenhouse Gas Protocol



### Quantification approach and data requirements

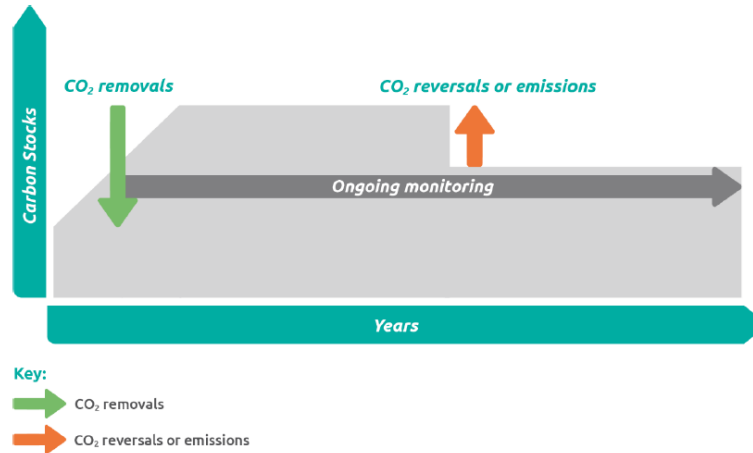
The LSRG requirements include the need for primary data plus a calculation of the uncertainty level of the quantification of removals. The need for primary data includes that “net carbon stock changes are accounted for using empirical data specific to the sinks and pools where carbon is stored in the reporting company’s operations or value chain”. Primary data would also be required every 5 years as part of ongoing monitoring (see below).

For uncertainty calculations, the requirement is that “removals are statistically significant and companies provide quantitative uncertainty estimates for removals, including the removal value, the uncertainty range for the removal estimate based on a specified confidence level, and justification of how the selected value does not overestimate removals”.

### Ongoing monitoring for reversals

The LSRG required ongoing monitoring of the relevant carbon pool in order to detect any losses. If there are any losses recorded, companies must account for these losses as reversals or emissions depending on whether the relevant carbon pool is still within the scope 3 of the company in that reporting period. If a company stops having the ability to monitor these carbon pools directly or indirectly through a partner, the company should assume that removals are reversed and they should report it as an emission or reversal.





9

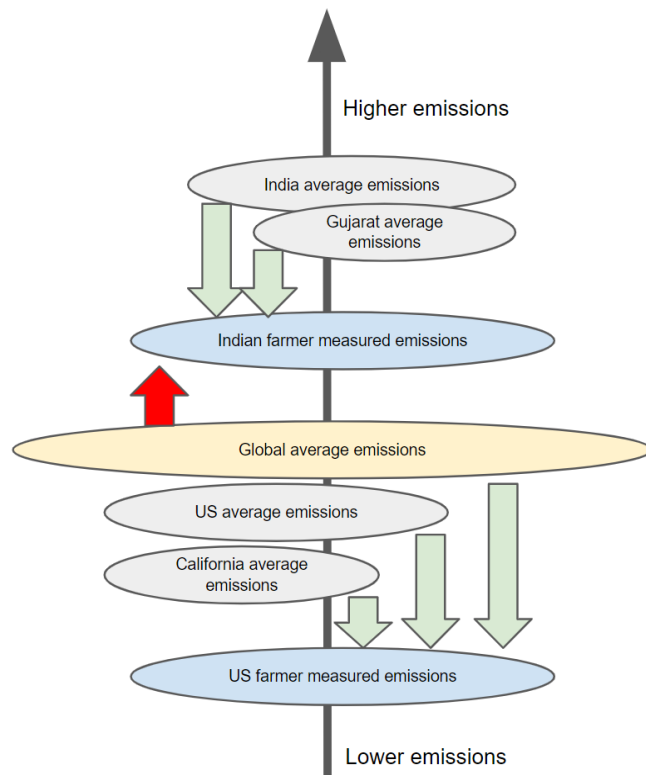
In this case, ‘ongoing monitoring’ does not include any defined end point, so the implication is that any organisation claiming or issuing claims for a removal must commit to monitoring that carbon pool forever.

**Challenges experienced when applying the Inventory accounting approach to US and Indian cotton farmers**

**What defines a credible baseline?**

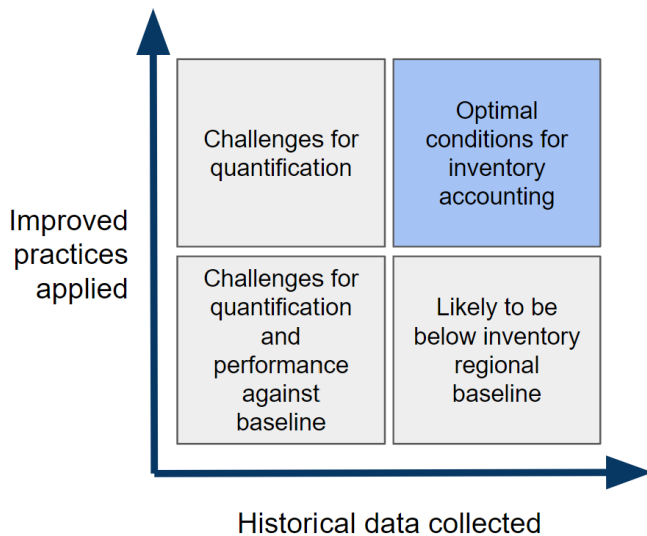
An important part of ensuring that an inventory accounting approach with financial incentives (like Unlock) is credible, is to validate that the specific measured impacts of an individual farmer are baselined against a relevant and appropriate number.

If farmers in the US and India each had their real measured outcomes benchmarked against an extremely averaged global baseline (which is often what companies are using in their current GHG emissions baseline data), the outcome would almost always be that US farmers would see an extremely beneficial reduction of their real data against the global average, and the Indian farmers would



<sup>9</sup> Land Sector and Removals Guidance, Draft for Pilot Testing and Review (September 2022), Greenhouse Gas Protocol

in fact see an increase in emissions against the global average, even if they had applied improved practices. This is because a number of prevailing conditions and systems in



each country means that they start at a significantly different level of average emissions. If an inventory accounting approach were to permit reporting companies to use a global average, this would be a major benefit to advanced western farmers, but would exclude most Global South farmers from participating in this kind of mechanism.

If we were to use more accurate localised data as a baseline, the degree of reward for some farmers might decrease, but it would reduce the likelihood of creating an unjust system that favours western farmers and excludes those in less developed countries.

This is why the Unlock Programme will be pursuing granular local baselines, and will be working with our Data Partner, Implementing Partners and Expert Advisors to ensure that baselines are as credible as possible and take account of:

- Representativeness
- Appropriate geographical specificity
- Sampling, data gathering and quantification approach
- Whether there are unintended consequences for farmers in the programme across different geographical regions and practice types

It is also important to ensure that companies using Unlock Units and other types of claims systems that apply an inventory accounting system invest in developing accurate and appropriate baselines. If Unlock Units are being calculated for farmers based on local benchmarks, this will determine the payments being made to farmers. But a claim for an inventory system is focused on the final 'outcome' number at farm level, and would not inherently require companies to re-baseline to the appropriate baseline number in their own accounts. The Unlock Programme will support reporting companies to apply the more accurate available baselines to their own inventory, to ensure that 'improvements' demonstrated using Unlock Units do not compare to highly inaccurate global numbers.

## Permanence monitoring

The current draft LSRG guidelines do not seem to have any end date specified for monitoring of removals. On the surface, this seems to make sense, since any reversal or emission should be reported by the relevant body making the original claim. However, the practicalities of this requirement are almost conceptually impossible to implement.

If a farmer signs a contract with an organisation like Unlock, committing to ongoing reporting of any reversals without end, the implication is that that farmer is not just signing their own commitment, but also for all future generations farming or otherwise buying the land. In all contexts, but in particular in Global South regions, asking an individual farmer or tenant to bind future generations of farmers and landowners to restrictive covenants is of questionable ethical and legal value, and could create risks around unbalanced power dynamics and inequity.

If a data or implementation organisation signs up to work with the Unlock Programme, it is also virtually impossible for them to commit to ongoing monitoring for the rest of time - since their organisation may cease to exist at a certain point. This means that Unlock, and all companies taking part in Unlock, would need to keep their own ongoing records that if there was any disruption in monitoring from any entity in the chain for 2023/24 claims, even 50-100+ years in the future, and if there were any evidence that monitoring was not ongoing, they would need to report an emission.

Technologically monitoring is also simpler in some regions than others - for example, in the US and a few other highly developed cotton farming regions, satellite data monitoring would be feasible to check for any reversals in major practices like tillage. But it is not yet clear that this technology is available at scale for Global South contexts, and the small sizes of farms and resolution of satellite data available may make this type of monitoring highly challenging for some time due to factors like cloud cover obscuring individual farms. Therefore, monitoring in these contexts would not only need to be ongoing forever, but also manual for the foreseeable future, meaning that the initial cost/benefit of the Unlock Unit could be far outweighed by the requirements for monitoring.

One option to address these practical challenges would be to set a more realistic functional minimum time period for monitoring, at least one that would relate to the typical period for assessing GHG emissions harms (e.g. 100 years) or a realistic lifespan of an individual or company (e.g. 50 years).

Other options that Unlock is implementing or exploring in the meantime include:

- Creating buffer pools within the Unlock claims to account for a realistic degree of reversals/emissions within the initial cohort of farmers
- Creating satellite monitoring systems that are functional in Global South contexts
- Creating a protocol of trigger events that would potentially signal that a reversal or emission is happening (e.g. a farmer leaves the programme, or reduces their practices, or does not submit data) that would require further investigation from Unlock and their partners
- Creating an insurance mechanism, so that if reversals/emissions from soil organic carbon were to be identified, alternative removals could be purchased to prevent the brand or the farmer from suffering negative consequences

### **Traceability requirements**

The intention of the LSRG guidance is clearly to ensure that traceability is sufficient to ensure that measurement and monitoring of the carbon pool can be credible. This intention is important, however with a system like Unlock, the measurement and monitoring is already begun at the level of specific fields, and all relevant safeguards are designed 'bottom up' from that field level. The degree of connectivity between the brand 'offtaker' and the field is therefore about which entities can appropriately claim the Unlock Units.

Although the traceability systems of some partners, and the 'supply chain engineering' approach piloted during the Unlock Pilot Phase can be scaled globally, these systems are only feasible in certain geographical areas and programmes. In order to scale Unlock globally, the degree of resources and costs involved in using the supply shed approach from VCI vs the full traceability approach is significantly higher. If the aim is to mandate textile brands to implement full traceability within their value chains due to other principles, this may be the intention. But if the aim is to scale credible GHG reduction measures, claims, and financial incentives for farmers, then full traceability is not the determining factor for the quality of the data, accounting or monitoring taking place. This is particularly true for Unlock, where actors in the middle of the value chain - for example fabric mills or dyehouses have limited incentives to address their scope 3 impacts independently of the scope 3 impacts of their customer brands, and therefore are not seeking to make claims along the supply chain. The supply chain traceability therefore does not need to help allocate claims along the supply chain, only to provide a link between the cotton on the field and the cotton products reaching the brand - accounting at each stage for wastage and other products.

## Final reflections

The preceding notes on the features, benefits and challenges of applying the intervention and inventory accounting methods to cotton farmers are captured at a relatively high level - and further exploration of the topics and technical aspects outlined here are planned in subsequent white papers. The ultimate aim of the Unlock Pilot is to test, learn and capture these insights as far as possible for the benefit of the textile industry and others designing impact reduction programmes for agricultural settings - particularly those in the Global South.

Some additional notes may also be helpful as context to those exploring these topics for their own strategic analysis:

- Guidance in this space is evolving fast, with some lack of clarity as to when updated versions of guidance documents will be published. Since organisations setting these requirements are voluntary, there are also other versions of intervention and inventory accounting approaches, and alternative perspectives on what is credible.
- We strongly emphasise the need to consult broadly with Global South stakeholders when designing global guidelines, or face the potential risk that the approaches developed are fundamentally at odds with the need for global Climate Justice. Many of the barriers being experienced during the Unlock Pilot phase are related to the application of guidelines, solutions and processes in Global South contexts - and the focus as these approaches develop
- Soil models are a useful and important tool in quantifying soil emissions (reductions) and soil organic carbon (removals) for agriculture. However, these models are also designed and built for a western (and particularly US-centric) purpose, and the requirements for calibration of these models are currently for peer-reviewed, paired treatment studies of long term impacts of practice change, which are not readily available in many countries and would take a long time to establish. The process of calibrating and validating these models to function in Global South contexts (both in terms of contextual data and in terms of appropriate technologies for data collection and field boundary mapping as well as ongoing monitoring) is therefore a complex and time-consuming one, and solutions like Unlock will not be able to scale to the countries that need them unless this calibration is carried out at scale, requirements for calibration are made more adaptive, or new soil models are designed for these contexts. Unlock will continue to work with its partners to address these challenges and create

appropriate solutions for countries that lack them - particularly in Asian and African regions.

- For solutions like Unlock, it will be very important to consider the GHG emissions for cotton as part of a wider picture, including co-benefit measures, crop rotation with other crops, and the wider landscape perspective. These are important for any programme to consider, and we will be sharing learnings and conclusions about the opportunities and challenges of a more holistic approach to understanding farmer practices and impacts whilst identifying GHG emissions as the driver of financial benefits to farmers.
- The role of the Unlock Programme itself is also important - and the processes created through the pilot phase must be credible, science-based, transparent and inclusive. To that end, we will also capture and share our learnings on how to responsibly develop these types of new systems - knowing which stakeholders and impacts we must represent, include and protect, and ensuring the utmost focus on appropriate, just, and beneficial solutions.