

# Hitting the right target: A proposal for monitoring accurate supply shed impacts

A GMI REPORT WITH SUSTAINCERT

## EXECUTIVE SUMMARY

The toolset proposed by General Mills aligns with its objectives of quantifying the accurate annual land-use emissions factor of a sourcing region or 'supply shed.' The data from this supply shed monitoring approach aims to inform corporations' real supply shed impacts and give them the ability to annually track changes in their land-based emissions and removals. This toolset is designed to provide confidence in General Mills' mitigation strategies and actions within its supply chain as it relates to its science-based targets. Since this data will apply to a landscape-scale sourcing area shared by many supply chain actors, the land-use EF could become a public good that underpins a more accurate and complete annual baseline, from which all supply chain partners can launch specific interventions to reduce emissions. General Mills is demonstrating the validity of this approach by investing in a pilot that produces robust data and by piloting concepts from the Value Change Initiative Guidance. General Mills hopes that this monitoring pilot will catalyze further investment by other actors in the supply chain to scale the approach, thereby allowing multiple corporations to harness this new toolset to align their Scope 3 GHG emissions with a 1.5°C pathway.

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## 1. Context: The importance of reducing Scope 3 emissions

A growing number of companies understand it is no longer enough to limit their greenhouse gas (GHG) emissions reductions to operations they directly control. A company's value chain or 'Scope 3' emissions frequently represent over half of their total GHG footprint, and they are central to setting and meeting science-based targets. It is therefore critical to find accurate and credible ways to reduce value chain GHG emissions.

Acknowledging this, General Mills (GMI), a global multinational manufacturer and marketer of branded consumer foods, has set an ambitious target with the Science-Based Target initiative (SBTi), committing to reduce its Scope 3 emissions in line with a 1.5°C pathway per the Paris Agreement. Knowing that nature-based solutions play a pivotal role in reducing agricultural emissions, GMI is actively promoting the use of regenerative agricultural systems to lower the Scope 3 emissions in regions from which it sources raw materials. Their regenerative agriculture approach aims to not only reduce emissions but also sequester atmospheric carbon in the soil and boost the productivity and resilience of agricultural ecosystem services. Their investments in both GHG abatement and soil carbon removals will allow GMI to realize their Forest, Land, and Agriculture (FLAG)-related science-based targets <sup>1</sup>.

## 2. Ambition & challenges

*“To meet its science-based target, General Mills needs to know the real size of the emission reduction gap that needs to be filled.”*

Scope 3 emissions remain hard to reduce and represent a frequent cause<sup>2</sup> for companies falling behind on their science-based targets. To better identify how and where to invest in regenerative agriculture, GMI first needs to better understand the carbon intensity of the commodities it sources. This means investing in tools to determine a more accurate emission factor and piloting new technologies to better calculate their annual land-use impacts.

### **Determining a more specific, dynamic emission factor for the commodities sourced**

Data inputs for GHG accounting are often limited to default emission factors (EF). A significant challenge to default EFs are their static nature: while they are useful for cost-effective accounting, they can be outdated and are often less effective in knowing the current status of upstream land-use impact from one year to the next. To gain a more dynamic and accurate picture of upstream suppliers' impact, GMI aims to monitor and calculate the annual flux of removals and emissions from its upstream land-use. This more accurate 'land-use' portion of the EF (or 'land-use EF') would replace static, default EFs and be applicable to the broader supply shed from which it is calculated. By measuring both land-based removals and emissions, this land-use EF would inherently encompass reversals that occur during the annual monitoring period. Alongside quality inventory data, this could become a compelling approach to monitoring and calculating a corporation's agricultural Scope 3 GHG inventory.

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<sup>1</sup> FLAG targets are the science-based targets for a firm's Forest, Land, and Agriculture related emissions from land use change and land management. 'FLAG' SBTs are separate from 'non-FLAG SBTs'.

<sup>2</sup> Giesekam, J et al, 2020. Science-Based Targets: On Target? Sustainability Research Institute, School of Earth and Environment, University of Leeds.

## THE VALUE CHANGE INITIATIVE & SUPPLY SHED CONCEPT

*The Value Change Initiative is a multistakeholder forum bringing together some of the world's largest companies, leading civil society actors, and internationally recognized accounting and target-setting frameworks to collectively define how to address and account for GHG emission reductions across global value chains. The initiative features consensus-driven guidance documents and tools that corporates can use to reduce emissions in their value chains and credibly report these outcomes in line with best-practice accounting and reporting frameworks.*

*The 'supply shed' concept was developed under the initiative to address situations where a reporting company may not be able to directly trace raw material sourcing to a specific supplier in the upstream supply chain, but can trace their sourcing to a group of suppliers within a broader region.*

visit [www.valuechangeinitiative.com](http://www.valuechangeinitiative.com) for more information.

The Value Change Initiative Guidance<sup>3</sup> (VCI Guidance) defines the supply shed concept. This concept allows downstream reporting companies to account for interventions (or actions taken within their value chain) for which there is no direct traceability. While the innovative approach developed by GMI to calculate land-use EFs does not relate to interventions, the approach does draw upon the supply shed concept by calculating the land-use EF of a specific commodity in an observable area (e.g., a supply shed) regardless of who sources from the region. Accordingly, GMI proposes use of this new, more specific land-use EF for the broader supply shed, where it can then serve as a more accurate baseline for those investing in interventions and calculating their Scope 3 GHG inventory based on this supply shed.

To determine a land-use EF for a supply shed, GMI's proposed approach would need to align with the forthcoming Land Sector and Removal Guidance from the Greenhouse Gas Protocol, which is expected to be finalized and published in 2023. This new Land Sector and Removal Guidance intends to provide a pathway for reporting companies to account for both the land-based emissions and removals that are inherent to the carbon flux of land-based sectors like agriculture. This accounting of soil carbon removals alongside land-based emissions intends to yield a more accurate, dynamic land-use EF that is updated year-on-year. While this approach would not constitute a full EF (as it does not include upstream emissions from the farmgate), GMI proposes to link these more accurate farm-level emissions to its full ingredient life cycle assessments for a more complete measure of both a raw material's carbon intensity and its Scope 3 GHG inventory. Accordingly, this land-use EF would allow firms such as GMI to annually report a more accurate 'updated baseline' of its supply shed land-use EF, helping to better inform potential action to take through their regenerative agriculture program to reduce landscape-scale emissions.

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<sup>3</sup> «Value Chain (Scope 3) Interventions - greenhouse gas accounting & reporting»

## Defining the toolset to more accurately quantify a supply shed specific land-use EF

To better measure its land-use impact and replace default EFs with greater accuracy EFs, GMI is piloting the combined use of remote sensing technology (Operational Tillage Information System, or OpTIS) and a process-based computer simulation model of carbon and nitrogen biogeochemistry in agroecosystems (DeNitrification-DeComposition, or DNDC). Both OpTIS and DNDC are provided in a toolset managed by the company Regrow, which can be calibrated for targeted supply sheds and commodities. The remote sensing can observe regenerative land practices, while the peer-reviewed model has a proven track record in estimating the impact of these regenerative agriculture practices on both short-term and long-term GHG emissions and soil organic carbon (SOC) dynamics. The data interfaces, which show field-level data at the 30m-by-30m scale, can be shared with third parties for monitoring, reporting, and verification. This toolset was piloted in Kansas, one portion of GMI's overall supply shed.

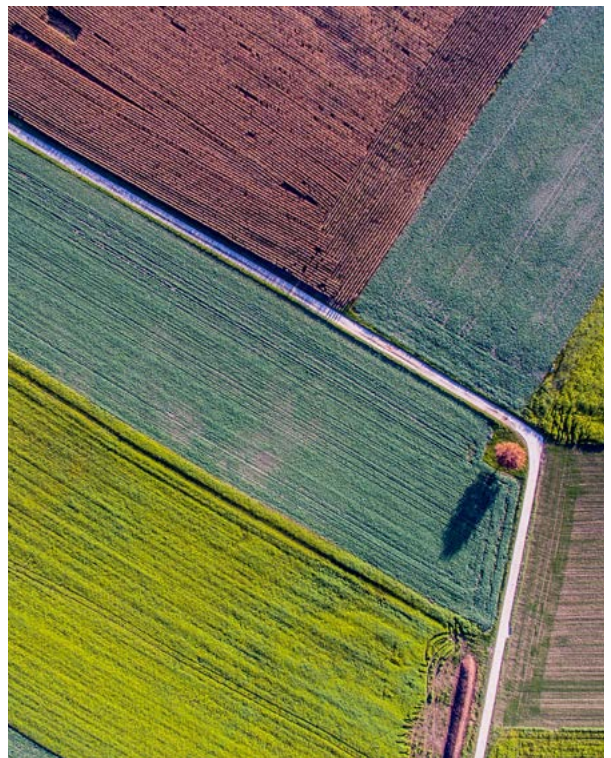
*By piloting the toolset's ability to calculate annual land-use impacts, GMI hopes to catalyze collective investment from other supply chain partners to scale this monitoring capability to everyone's collective advantage. In this way, a range of relevant supply chain actors can submit inputs into and benefit from this essential land-use EF data to inform their real emissions gaps and strategies for meeting their respective SBTs.*

### 3. Assessing the land-use EF monitoring approach

GMI collaborated with SustainCERT to assess the implications of its ambition and review the ability of the “monitoring, reporting, and verification” (MRV) toolset proposed to meet its objectives.

This assessment is part of the research and innovation work of SustainCERT, which explores what services beyond its value chain intervention verification pathways may be of value to reporting companies. The work of SustainCERT's research and innovation team also informs topics for discussion in future Value Change Initiative working groups and labs.

SustainCERT analyzed the data categories that the Regrow toolset monitors for the purpose of assessing whether the approach might be sufficient for determining a supply shed specific land-use EF. With disclosure from Regrow about what can be observed by remote sensing relative to the data inputs for the DNDC model, SustainCERT was able to assess whether the toolset aligns with the objective of measuring a land-use EF. Noting that this review was not a validation against any standard or program, it was established that the toolset is adequate for the general task as identified by GMI, although there are some limitations to the approach that warrant further research to address.





## Data Parameters

The assessment established that the toolset can monitor many key data required for calculating estimates of the supply shed land-use EF, including:

- Crop type and changes over time,
- Natural land conversion to cropland,
- Type of land management practice (both current and historic)
- Climatic zone data,
- Crop yield,
- SOC stock flux
- Changes in GHG emissions from the soil, and
- GHG trends over time.

## The Model profile

The DNDC model has been peer-reviewed and was applied to a pilot region. The model was reviewed by SustainCERT to understand how it is calibrated, how it generates GHG flux estimates, and how uncertainty is accounted for to underpin the principle of conservativeness in GHG reporting. Regrow stated that it is calibrated for the specific regions that were monitored under GMI's pilot. The review of the pilot monitoring program showed that the baseline EF of the supply shed was calibrated with direct measurements from peer reviewed studies.

The approach, however, does not propose resampling each year for annual monitoring and reporting. While direct measurements at regular increments across the supply shed would be ideal, it is likely to be cost-prohibitive at a supply shed scale. A well-calibrated model whose accuracy and uncertainty deductions are validated and transparently disclosed can be expected to provide acceptable year-on-year emissions and removals estimates. A commitment to continuously improve the model's calibration through the integration of new data would further strengthen the approach. This was assessed to be the case with Regrow's use of the toolset in this pilot. To allow for broader applicability to more stakeholders and wider geographies, however, the toolset would need to include the full suite of possible regenerative agriculture land management practices and be calibrated for the supply sheds to which the innovative approach is applied.

## Limitations

Concerning the land-use EF objective, the toolset has some data gaps to overcome:

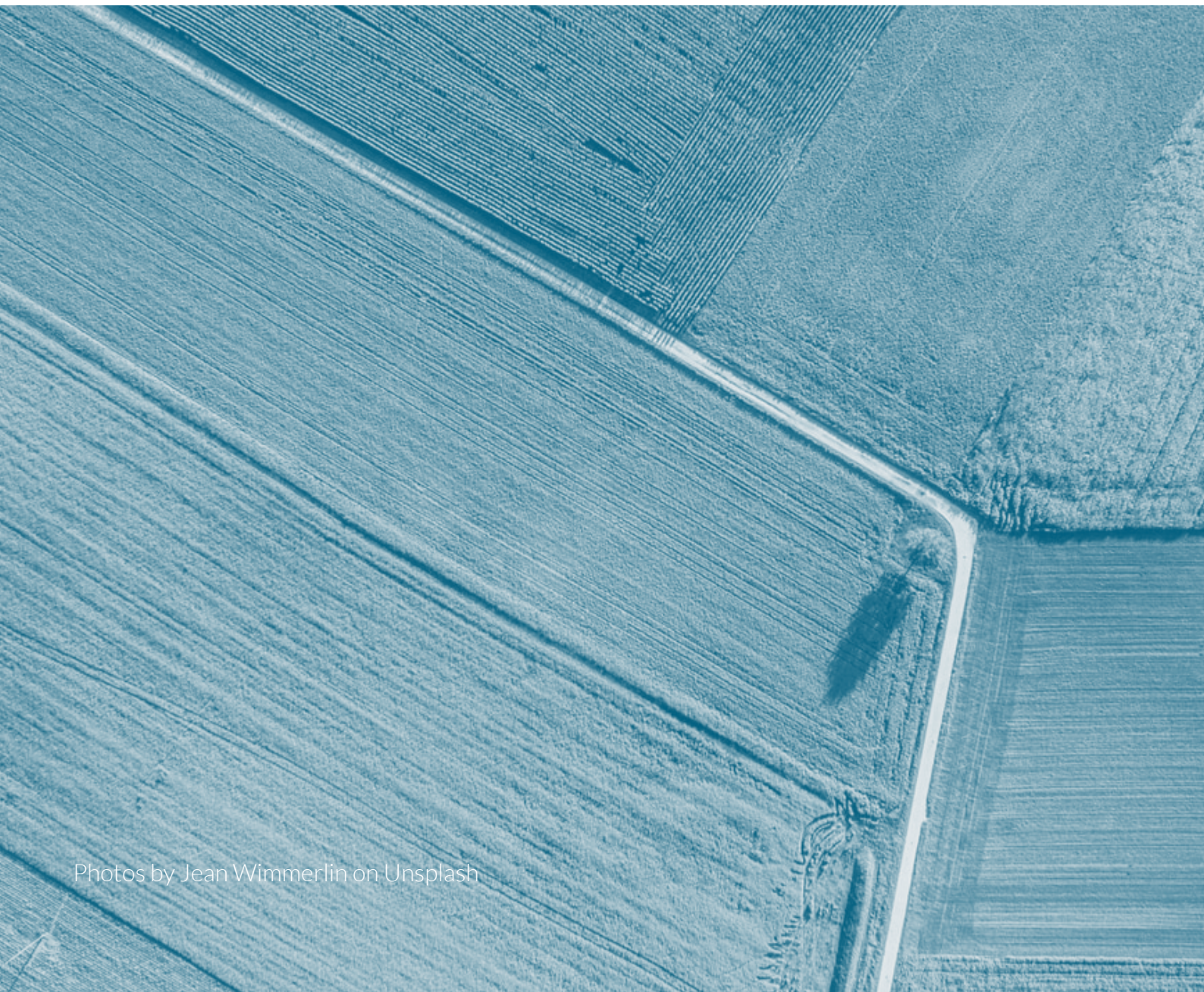
- Progressing beyond the default EFs for irrigated or non-irrigated systems is a challenge. While the toolset does not yet address this directly, it does aim to combine remote sensing of field shapes as a proxy for types of irrigation.
- Burning is a similar, potentially larger challenge. Ongoing research by Regrow is underway to identify relevant data sets for integration.
- On-field fossil fuel use is excluded from the toolset's current datasets and cannot be detected via remote sensing; if these emissions were material, new data sources would need to be integrated.
- Upstream emissions, such as fertilizer production, are also excluded (hence the term land-use EF versus a more complete 'farmgate emission factor'). The upstream emissions may be established by working with LCA database partners to ascertain the upstream portion and together create a more accurate, supply shed EF.
- Double counting risks can be avoided by masking out fields where interventions have taken place, a possibility offered by the proposed toolset. This needs further analysis to ensure feasibility at scale, however.
- While this report assessed a new proposed approach to monitoring supply shed impacts, a validation and verification process is recommended if implemented for use in GHG inventory reporting.

## 4. Conclusion and next steps

The toolset proposed by General Mills aligns with its objectives of quantifying greater accuracy, annual land-use emissions factor of a sourcing region or 'supply shed'. The data from this supply shed monitoring approach aims to inform corporations' real supply shed impacts and give them the ability to annually track the changes in their land-based emissions and removals. This would give them a more informed view of the emission gap they need to fill for reaching their science-based targets and confidence in their mitigation strategies. Since this data will apply to a landscape-scale sourcing area shared by many supply chain actors, the land-use EF could become a public good that underpins annual, more accurate and complete baselines from which all impact layer partners can launch specific interventions to reduce emissions. GMI is demonstrating the validity of this approach by investing in a pilot which produces robust data and by piloting relevant concepts from the VCI Guidance. GMI hopes that this monitoring pilot will catalyse further investment by other actors in the supply chain to scale the approach, allowing these corporations to harness new technology for aligning with the 1.5-degree pathway. For these reasons, GMI's proposed approach, the learnings from the pilot, and the accounting implications will be discussed in the third Food & Agriculture Working Group of the Value Change Initiative in order for the benefits of this collective investment to be reaped by all relevant stakeholders.



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