Verifying ‘where’ in the supplier network builds resilience and strengthens brand trust

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Abstract

Opaque supply chains are a liability, especially for businesses that want to maintain their brand integrity, adhere to regulations and stabilise their investments. It is no longer profitable or ethical for supply chain owners to remain in the dark about the locations and operations of their multiple tiers of suppliers. Reputable brands, financial institutions and regulators are pushing for more transparency in each step of the value chain to safeguard regional resources and ensure business continuity. These organisations have established that location intelligence is the foundation for transparency, as the verification of links in a supply chain begins with where a product starts its journey as a raw material. That is why a group of location-based industries and major goods producers formed the Supply Chain Data Partnership, which has developed a proof-of-concept verification process and registry for increasing the end-to-end transparency of global supply chains. Modern geographic information system (GIS) technology and ample availability of satellite imagery make it possible to partially verify locations in a less costly and more efficient manner, as well as maintain and monitor those verifications in a secure independent registry. The business incentive for a supplier to participate in such a verification process is their ability to obtain a unique label or stamp that serves as proof of independent verification to meet growing buyer demands for transparency. The label or stamp would be theirs to use for marketing purposes and to attach on goods in a radio-frequency identification (RFID) tag or barcode. A supplier could also use the label or stamp to attract new business from supply chain owners seeking verified suppliers. Ultimately, the label or stamp would be a contribution to a finished product's digital passport, a traceability measure that will soon be mandated for goods sold inside the European Union (EU) and may be mandated elsewhere in the future. This paper discusses the Supply Chain Data Partnership's endeavour to create a location verification process and registry to promote supply chain transparency. The paper presents the results of a proof of concept focused on soybeans, then discusses the potential positive impact of adopting these processes and tools. This article is also included in ***The Business & Management Collection*** *which can be accessed at https://hstalks.com/business/.*

Keywords

visibility, transparency, location, verification, geospatial technology, spatial analysis, GIS

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INTRODUCTION

The reasons to expose one's supply chain to more scrutiny are many, not least of which is de-risking to maintain brand equity, make safer investments and continue to expand access to valuable markets. In selling transparency to the C-suite, there is intrinsic financial value for an organisation in knowing exactly where and how its products are being sourced, manufactured, compiled and delivered in every link of the chain. This end-to-end insight helps organisations avoid disruptions to the consumer, protect quality and safety of finished goods and meet growing regulatory requirements — all of which maintain steady product flows that contribute to revenue and profits goals. That positive financial gain is in addition to the inherent societal and ethical value of helping to protect biodiversity, preserve human dignity and counteract climate change. Supply chains generate 60 per cent of global emissions,[1] according to the World Economic Forum (WEF), and up to 90 per cent of an organisation's environmental impact is in its

value chain, according to the Carbon Trust.[2]

The paths of materials and goods travelling along a supply chain have long been clouded. One reason is the physical geographic distance, making in-person audits and inspections difficult. Then there are the financial motivations to seek the lowest cost provider to maintain or grow profit margins. Both factors have led to a wide range of damaging situations, such as rampant deforestation to produce palm oil, child labour employed to produce clothing, and unsafe factory conditions exposed only after causing a fatal event. Such situations damage any trust built between the brand and its customers — even if the brand was entirely unaware of what was occurring multiple steps away in the supply chain. It might take years to rebuild that trust, if at all. A majority of UK and US chief executive officers (CEOs), 69 per cent of the 2,000 surveyed by the procurement company Proxima Group[3] in 2023, worry about the possibility of human rights issues in their supply chains.

Further fragmentation in the agriculture, manufacturing, distribution and logistics industries makes it challenging for anyone to document and verify a product's path from raw material sourcing to finished good. An additional challenge is suppliers' reluctance to provide information that might reveal the identity of their own supplier network due to concerns about competition.

Transparency, on the other hand, preserves brand equity, de-risks investments and satisfies regulatory requirements, while also supporting verifiable sustainability goals that in turn help preserve finite natural resources.

This paper discusses how the Supply Chain Data Partnership (SCDP), a global collective action collaboration of location-based industries and major goods producers, is endeavouring to make supply chains more transparent. The SCDP has focused initially on verifying the locations of commodified agricultural assets such as farms, sites and facilities that produce palm oil, soy, cotton, rubber and wood.

The process is made less costly and cumbersome by utilising accurate modern mapping technology and satellite imagery. The group has successfully piloted a proof of concept of a global asset location registry, built with geographic information system (GIS) technology, that would create the foundation for tracing a complex supply chain. Ordnance Survey, Great Britain's national mapping agency, and the collaboration's partners — Esri, Unilever, Planet, Deloitte, Trase, GS1 and Global Legal Entity Identifier Foundation (GLEIF) — are facilitating the verification of *where* along a supply chain: where materials are sourced, where a product is made, where it came from, where it will go, and so on. The SCDP, in effect, can become the global custodian of trusted location intelligence for supply chains.

As the GIS-based registry is intended to be hosted as a for-fee service, the various stakeholders (farmers, brokers, producers, financial institutions, etc.) will have defined access based on role, such as contributor, viewer and/or analyst. This subscription-based model will accelerate use of the registry and applications across the ecosystem while minimising upfront costs related to stand-alone systems and data. A key value of the registry is that information will be verified and updated on an ongoing basis, providing stakeholders with the most up-to-date resources without the system management overhead (see Figure 1).

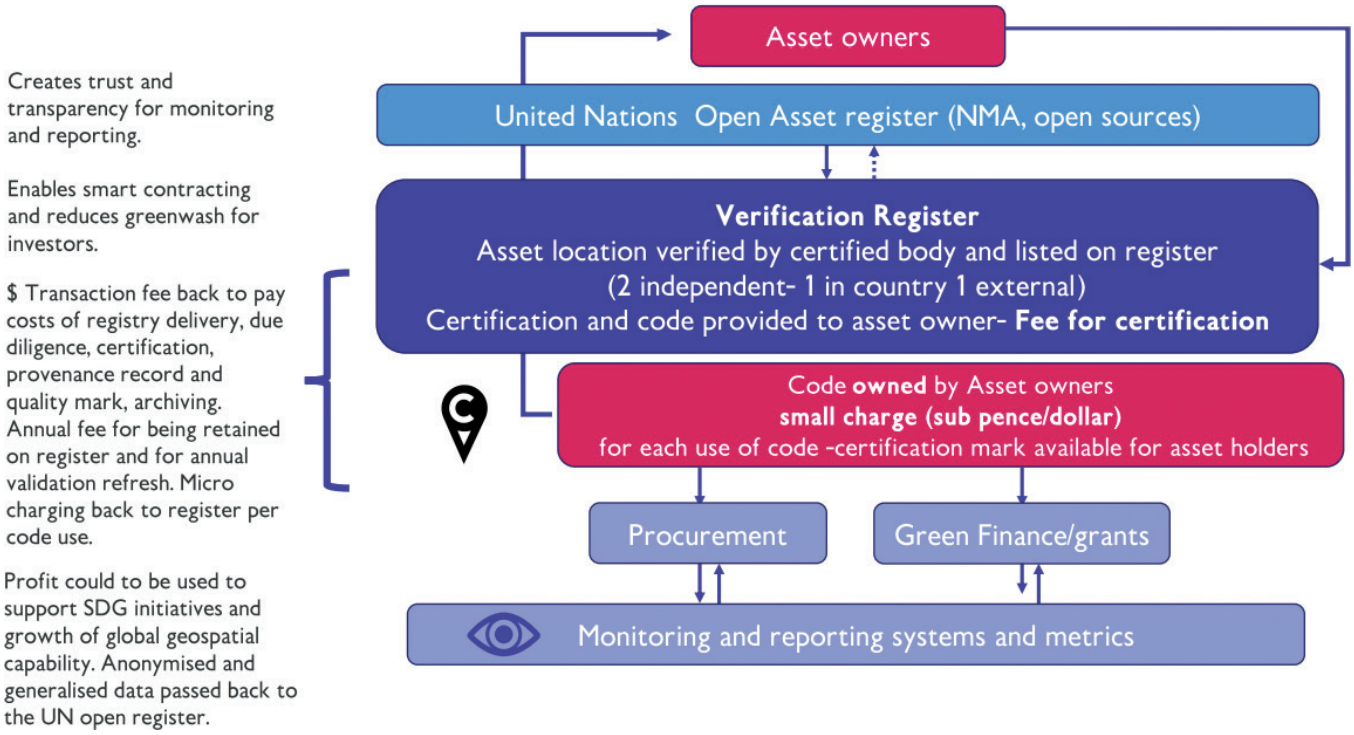

FIGURE 1 Verification location system under consideration
Source: Ordnance Survey

DATA TO DRIVE DECISION MAKING

There has been no lack of attempts to make supply chains more visible. The effort, however, is often undertaken by an individual organisation and can be costly. It is also labour-intensive, often involving a team dedicated to querying each supplier about their own suppliers and so on, as well as verifying those details.

This was the case for at least one major US automaker.[4] The company knew who its Tier 1 suppliers were by virtue of the shipments arriving directly. When it came to better understanding who the company's Tier 2 and Tier 3 suppliers were, however, it required physically reaching out to its Tier 1 suppliers, and then their own suppliers, to seek out the information. Once gathered and input into GIS, the information about where all the components were coming from and how they connected upstream quickly proved its value. Visualising the information on interactive, layered maps allowed the company to take note of extreme weather forecasts that might affect its suppliers' operations, helping to abate risks and avoid factory assembly line shutdowns. The gained intelligence guided the company in responding to an adverse geographic event more quickly.

In another case, a global coffee producer[5] that acutely values the long-term preservation of its primary natural commodity relies on a sustainable supply chain. It has chosen to invest in its suppliers and their communities, supporting the research and implementation of region-specific

sustainable agricultural practices with technical assistance and infrastructure improvements.

Despite the success of such individual efforts, attempts to scale supply chain visibility measures have often lacked an incentive for suppliers to securely provide their information for traceability purposes. The data is valuable to buyers and, conversely, so too is the certification to suppliers. But many previous efforts pushed the financial burden, as well as needed resources, solely to the supplier rather than having the brands share in the requirements.

The SCDP proposed methodology provides the necessary incentive and shifts the burden across the supply chain's stakeholders. Verification would give the location a label or stamp that could then be linked to radio frequency identification (RFID) tags, barcodes or the GLEIF system (see Figure 2). The label or stamp can then more easily, and visibly, show the connections to it, tracking the movement of materials over time. The label or stamp, owned by the supplier, would have intrinsic marketable value that could be shown to other buyers, effectively expanding the supplier's market. By conveying compliance in certifying the locations of their assets, the label or stamp shows buyers and investors that suppliers are willing to be transparent in their operations and be scrutinised.

The data and certificates produced by the SCDP process would also be searchable on a secure, international registry that meets global registry standards. Stakeholders at multiple touchpoints of the supply chain could benefit from such a registry. Traders could use verified locations in smart contract applications that dictate interventions in the case of a supplier not adhering to transparency requirements. Retailers and investors, both public and private, could gain clarity on environmental and climate risks in their supply chains. The information could then be used to satisfy regulatory, due diligence and disclosure

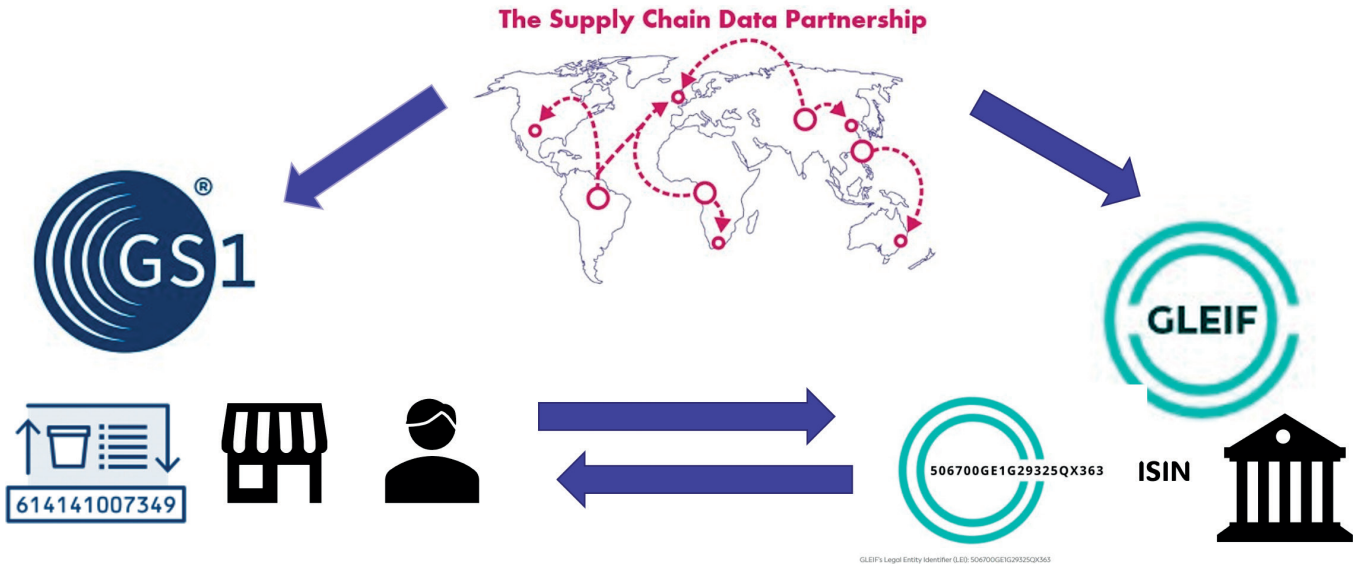

FIGURE 2 Connectivity — linking the identifier keys
Source: Supply Chain Data Partnership

needs. Auditors could also access the information to confirm corporate claims. In addition, the organisations monitoring climate and environmental conditions worldwide, such as the United Nations (UN), could utilise the spatial data to map and compare risks at a global level.

The asset location registry, built with GIS at the foundation, is a mechanism that can bring trust into the system for all parties involved, as well as shine a light on points of the supply chain that need to be exposed and disrupted to prevent future environmental and societal degradation. This degradation has the potential to not only affect global quality of life but also cause a shock to global economies dependent on breadbasket food products shipped around the world. Much of the global materials and goods travelling through supply chains start out as seeds planted in soil that needs to be healthy and moist and unpolluted. If there is drought, soil issues or biodiversity loss — including the loss of natural predators that might protect a crop by devouring threats — those product streams will simply run out.

The Green Finance Institute[6] recently quantified what the loss of natural capital would do to the UK's economy in its report, 'Assessing the Materiality of Nature-Related Financial Risks for the UK'. It notes that by the 2030s, the UK's gross domestic product (GDP) could be as much as 6–12 per cent lower than normal, depending on whether the deterioration of the natural environment has only a domestic impact, causes supply chain disruptions or coincides with a pandemic-level event.

A more visible supply chain is a competitive advantage for producers wanting to prove their legitimacy and expand their market, as well as for individual supply chain owners who want to adhere to regulations, become more resilient in a competitive environment and ensure their natural materials remain viable in perpetuity while positively supporting their communities and families.

On a greater scale, visibility is also a competitive advantage for any national economy.

PROOF OF CONCEPT: SOYBEANS

The SCDP chose to first concentrate on a single commodity, soy, to focus its proof of concept.

As soybeans have grown in popularity globally for their multiple uses, they have become the product of intense industrial farming practices that place increased demands on water, energy and soil. Soybean production has also led to widespread deforestation as large farms push out smaller, more sustainable farms. Left unchecked, unsustainable soybean farming would continue unabated, threatening ecosystems and the future of soybeans themselves as a diminishing natural resource. The same could be said for numerous commodities.

Soybeans, once harvested, are stored and then sent to crushing facilities where the resulting soybean oil and soybean meal are used as ingredients for animal feed, biofuels, personal care items and processed food (see Figure 3).

In its proof of concept, the SCDP shows how it can maintain a registry of certified soybean farming operations by using a combination of spatial analysis and satellite imagery to verify that the farm's activities are not contributing to environmental or social degradation.

In the SCDP's proof of concept for the asset location registry, the supply chain owner (in this case, Unilever, in the role of customer) would ask its supplier, the asset owner (or soybean farm owner) to

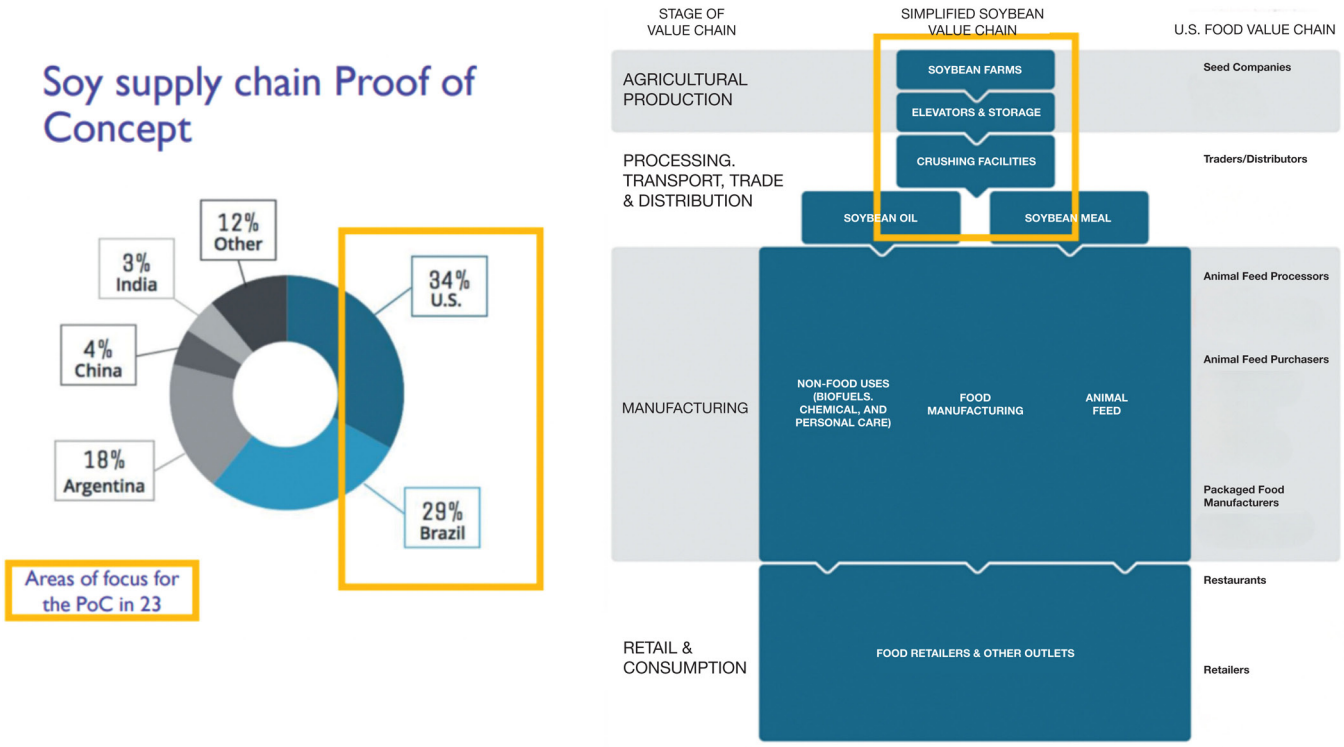

FIGURE 3 Soy supply chain proof of concept
Source: Soybeans – Engage the Chain

register. The soybean farm owner would add its asset details, including its location, to the registry. A verification body, such as Ordnance Survey, would check the soybean farm's location and verify it, adding a date stamp of verification. That farm would be marked as verified in the registry, awarding the farm owner certification and a unique ID, which it could promote to other buyers, potentially expanding its market. The registry would offer ongoing monitoring of the farm's location.

Remote satellite imagery provided by Planet helps support verification by allowing a virtual investigation of a site in granular detail (see Figure 4). By focusing on the physical assets one can identify from space, the SCDP's role in verifying and identifying locations is not repeating the efforts of any other organisation. Rather, it fits with and alongside other efforts such as those of The Constellation, led by Rewired Earth and Bankers for Net Zero, to increase visibility in the global supply chain so financial markets can be a protective force for healing the planet.

WHY INCREASED VISIBILITY IN SUPPLY CHAINS MATTERS

Sustainability is a competitive advantage. Consumer behaviour alone has proven unable to change company practices. Regulations and financial stakeholders, however, are driving a shift in how and where an organisation sources its products from end to end. Considering this, the ability to say precisely where something is coming from is foundational. Risks cannot be determined

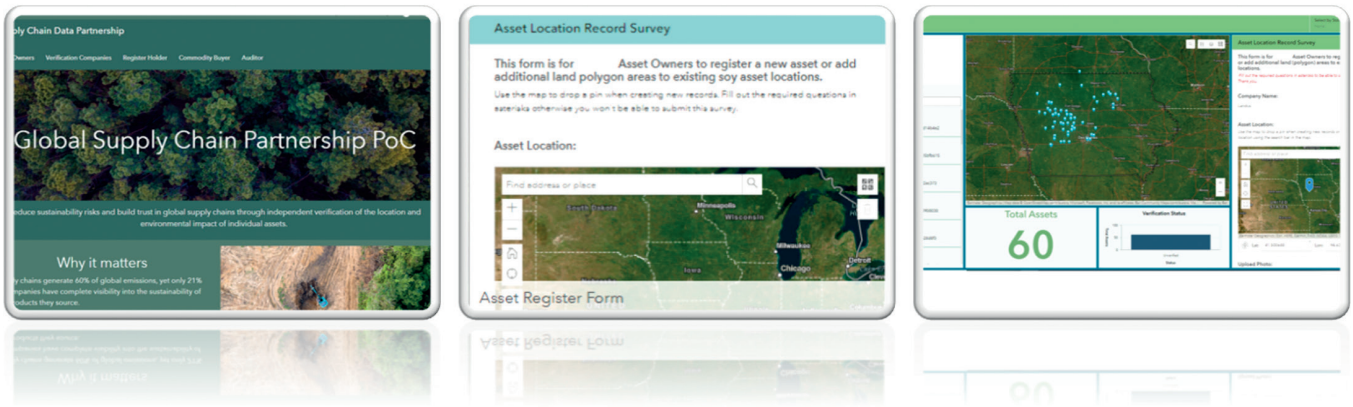

FIGURE 4 Registration and monitoring proof of concept

without knowing the verified location of the source of materials. The SCDP label or stamp enables a digital passport — such as what the EU will soon mandate for goods sold inside its boundaries, and likely other governments will require. It underpins that mechanism. Without it, a supply chain is not tethered to reality, and neither is the financial sector that funds so much of the movement of goods. With financial institutions pushing for location-based information, those supply chain owners who cannot provide the verified label or stamp could find themselves locked out of potentially lucrative markets, while those with verified sites become preferred suppliers.

The highly disrupted supply chains during the COVID-19 pandemic inspired many companies to trace their suppliers more closely, in search of alternatives for when the flow of goods slowed. The National Association of Manufacturers[7] noted in its fourth quarter 2023 survey that 86 per cent of those who responded had been actively de-risking their supply chains over the last two years. Limiting risk to their supply chains remained a major concern for nearly 34 per cent of respondents.

Companies with lengthy, multitier supply chains have continued to operate largely in the dark, however. According to a 2022 McKinsey & Co. survey[8] of 113 organisations, 45 per cent reported having either no upstream visibility or very limited visibility, with knowledge of only their first-tier suppliers but nothing beyond. The importance of increasing end-to-end visibility in their own supply chain was noted by two-thirds of global business leaders surveyed by accounting company KPMG[9] in 2023.

Additionally, with regulators, customers and investors more closely scrutinising businesses' Scope 3 emissions, better end-to-end visibility can include views into a supplier's sustainability credentials.

Transparency is needed before properly monitoring and mitigating potential environmental damage. For businesses reliant on finite or diminishing natural resources (eg rubber, paper or cardboard producers, food production), exposing a supply chain to additional, visible scrutiny can ensure the resource is sustainably maintained. Using GIS to create a clear view of a forest, for example, shows if it hosts at-risk species. A mapped view with satellite imagery and layers of data can

provide a deeper understanding of a forest landowner's land management practices before they are hired as a supplier, demonstrating a company's due diligence. The proof is in the verifiable data and, in the case of the SCDP, the certification.

CONCLUSION

A visible and verified supply chain at a global scale is complex but crucial for financial, social and environmental resilience. The SCDP's approach represents a step forward. By leveraging data, modern GIS technology and satellite imagery, the partnership's global asset location registry can ensure the verifiability of each link in the supply chain. This level of scrutiny is vital as it helps prevent environmental degradation and labour abuses that can often be hidden within the complexities of supply chains.

There are also financial incentives for suppliers and their buyers to participate in this verification process. By offering a verified label or stamp, suppliers can differentiate themselves in the marketplace, appealing to buyers who are increasingly demanding ethically sourced and environmentally friendly products to maintain their reputations, adhere to regulations and appeal to consumers wanting guilt-free products. This not only helps suppliers expand their markets but also encourages them to adopt sustainable practices, which can lead to long-term financial benefits.

The proof of concept, particularly with commodities like soybeans, has demonstrated the feasibility and benefits of this approach. Verified locations provide a clear path for companies to follow, ensuring their products are sourced responsibly. Seeing where products are coming from at each step of the way can reveal issues before it is too late, and supply chain owners and traders can shift their purchasing power to those suppliers with verified sustainable operations instead.

An objective third-party entity verifying locations and clearly illuminating a product's path provides knowledge that can satisfy regulators focused on sustainable practices, calm investors nervous about supply chain disruptions and encourage suppliers to expand their markets.

By utilising accurate modern mapping technology to add context to satellite imagery and support a consistent approach to location validation, we can see just where and how a supplier is operating their businesses from farm, to storage, to mills, to refineries, to processing, to the buyer. A global strategic collaboration such as the SCDP offers a common language of place.

Ultimately, by better illustrating a product's journey from start to end, the SCDP's registry may eventually create an easier way to reverse engineer a supply chain, providing a foundation for a global circular economy.

Shifting from opacity toward a model that promotes sustainability and transparency brings with it a strategic advantage that can lead to financial gains, enhanced brand trust and access to new markets. An increasingly transparent global supply chain will result in benefits for businesses, consumers and the planet alike.

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