

Cover photo: SFA cotton field trial site near Gonaives, which marks the reintroduction of cotton to Haiti following a 30-year absence.

January 2018

CONCEPT NOTE | **BLOCKCHAIN COTTON PROJECT IN HAITI**



smallholder farmers alliance



impact farming

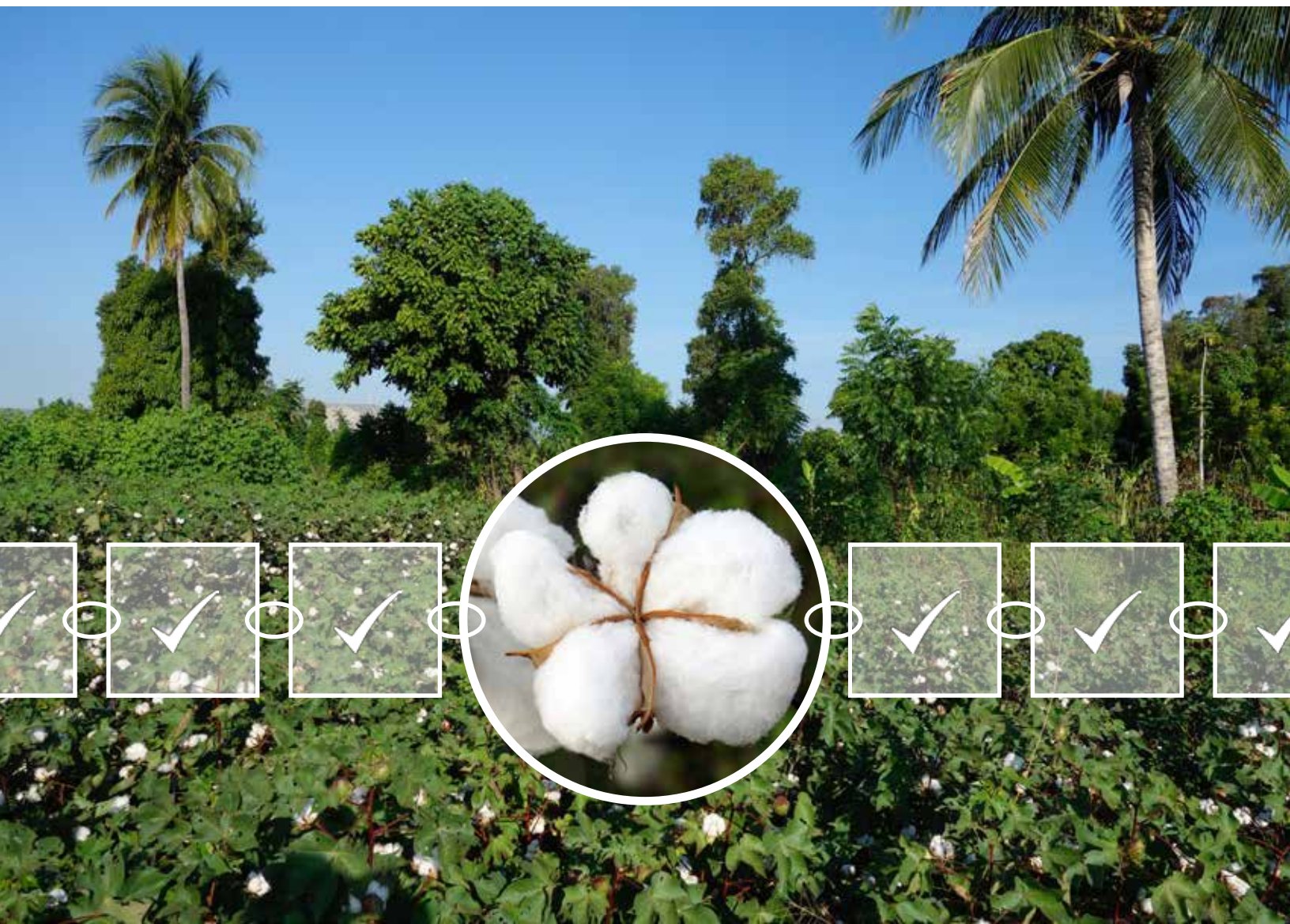


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CONCEPT NOTE | BLOCKCHAIN COTTON PROJECT IN HAITI

An initiative using blockchain technology to integrate data, traceability, transparency and efficiency into a smallholder supply chain in Haiti.

In a relatively short space of time, smallholder farmers throughout the developing world have gone from having virtually no landline phones to more than 70% now having a cell phone.

Many thought this technological advance would lead to farmers using their new phones to access data and improve efficiency, but progress has been very slow because of the high cost of data and the lack of services specifically geared for use by smallholder farmers.

Blockchain is a new technology with the potential to finally unleash the potential of cell phones to dramatically improve the efficiency and profitability of smallholder farming.

What is Blockchain?

Most people know the term blockchain because it replaced banks in guaranteeing the value of Bitcoin virtual currency. This is done by validating every transaction that involves the buying and selling of Bitcoins.

Each transaction is an item of data that constitutes one 'block' in a connected chain of data blocks. Together these blocks make up a database that is accessible to a group of participants in a decentralized network.

As each new piece of data is entered into a block, it is connected to all the previous blocks because the new data is validated (either through an algorithm or a third party) based on the previously entered data. This means that the data in any one block cannot be modified without simultaneously modifying all previous blocks. And because no one participant controls the database—and all data can be seen immediately by all participants once it is entered and validated—it makes it impossible to change any one piece of data after it is entered.

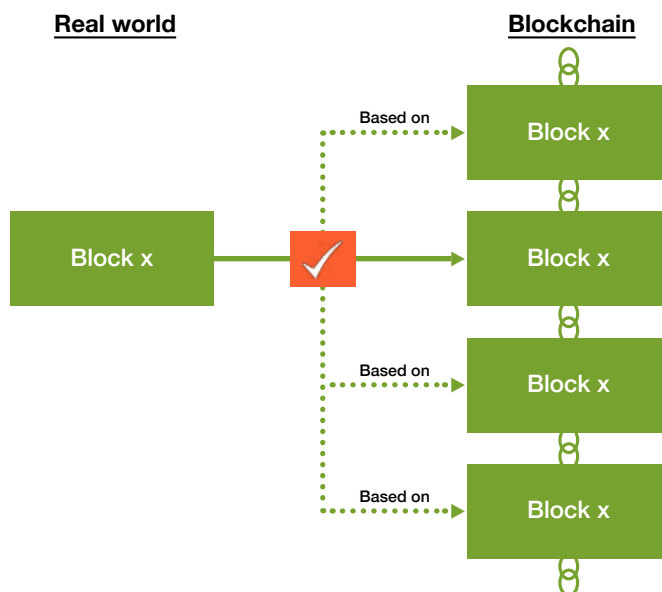
It is fair to say that there is now an extraordinary level of interest in figuring out how to apply blockchain technology to many other fields of human endeavor. This is particularly true with any supply chain that

involves the transformation of natural resources and raw materials into finished products. The opportunity in supply chains is that every supply chain transaction from source to brand can be recorded onto a blockchain database and linked to the physical material as it passes through the supply chain.

The Smallholder Farmers Alliance (SFA), Impact Farming (IF), Better Sourcing Program (BSP), RCS Global (RCS) and global outdoor brand Timberland have come together as a working group to apply blockchain technology to the tracking of agricultural produce—starting with cotton—as it passes through a supply chain from individual smallholder farmers in Haiti through to buyers from overseas. As soon as is feasible, the next crop to have blockchain applied will be moringa.

Bundling Supply Chain Data and Services

The data gathered will be specific to each unit of produce from a given farm. Take the example of 600 lbs. of raw cotton from a one-hectare field in Haiti. The company at the other end of the supply chain that is buying the cotton will know the complete history of that 600 lbs of cotton: the name of the farmer who grew it, the GPS coordinates of where the farm is located, what the farmer's costs of



operation were for that field, the price the farmer was paid, how it was grown (for example, the exact applications of fertilizer, pesticides and herbicides and whether those comply with organic standards), what impact the growing of that particular crop of cotton had on the environment (and tracking crop rotations), how did women farmers benefit, how was the cotton processed (ie., the seeds removed and the resulting cotton lint formed into bales), what was the cost of every processing, handling and transportation step between the farm gate and the ship on which it was exported from the country.

This information is of great interest to the end buyer because they will now have all the raw data for what was previously a set of separate standards and certifications, each with their own procedures for monitoring and compliance. This will be true for crops like cotton, but even more so for food or nutritional supplements. And the result will be a much less expensive process that is both streamlined and completely integrated.

Equally important is that the farmers themselves will have access to data. They will be able to make informed decisions as to what to plant based on projected crop prices, track their own cost of operation, compare prices for inputs and anticipate fluctuations in crop prices. But the data chain itself allows other services to be bundled, particularly when smartphones are the backbone of the operation for both data entry and retrieval. The added services can include weather forecasts, guaranteed purchase agreements, mobile payments for crops made in real time, advances against future harvests and one day even crop insurance.

From Feasibility Study to Pilot Project

The five members of the working group each have a key role in figuring out how to apply blockchain technology to smallholder agricultural production in Haiti, with an initial focus on cotton:

- **Smallholder Farmers Alliance (SFA)**, supported by **Impact Farming (IF)**, has just completed field tests of 15 varieties of cotton (see cover photo) in order to determine which are best suited to commercial cultivation by smallholder farmers starting in July

and August of this year. As well, the SFA is launching a new customized commercial supply chain for smallholder farmers that will provide the framework for the blockchain pilot project;

- **Better Sourcing Program (BSP)** and **RCS Global (RCS)** have pioneered the real time capture and reporting of quality data from small scale miners and are currently developing related blockchain case studies to trace material from source to consumer. They will now be applying this combined experience to smallholder agricultural supply chains;
- **Timberland** has committed to buying up to one third of its annual global cotton purchase from SFA Haitian farmers, once there is sufficient volume and subject to price and quality. The company will identify the standards and certifications (including organic) that are necessary from their side as a potential purchaser of export cotton.

The first task of the working group is to conduct a feasibility study, the outcome of which will be a published proof of concept paper that will be the basis for a full-scale pilot project to follow.

A critical feature of the feasibility study will be to design a reporting system for gathering, validating and inputting data for every step in the supply chain. At the field level, the goal is to design a community-based



SIPA Capstone Workshop

The **Columbia University School of International and Public Affairs (SIPA)** has chosen the SFA as the subject of a 'capstone workshop' in which a team of graduate students provide a consulting service on a real-world problem. One of the focuses of the consulting service for the SFA involves the students conducting research and input to the feasibility study for the Blockchain Cotton Project in Haiti.



Carbon Certification

The SFA is partnering with CO2Logic to create a certified carbon credit program based on a combination of climate smart agricultural practices and tree planting on the part of the SFA farmer members. The fact that the SFA is in the midst of designing a new supply chain in Haiti that incorporates blockchain technology represents a unique opportunity to integrate a cutting-edge carbon certification plan that will directly benefit smallholder farmers.

reporting team that has a built-in system of checks and balances to ensure the quality of the data.

The timetable for the feasibility study is 6 months, from February to July, 2018 (subject to securing funding), noting that there will be some overlap with the pilot project which will be in development starting earlier than July but with built in flexibility in order to be adjusted based on the findings of the study.

In initiating this blockchain study, it should be noted that the SFA conducted exhaustive feasibility studies as the basis for embarking on both moringa and cotton as export crops.

Advisory Group

As far as can be determined, the scope of the pilot project outlined in this concept note is unique and has ramifications far beyond the borders of Haiti. This is particularly true as some 100 million out of a total of 500 million smallholder farms in developing countries grow 75% of the world's cotton. Consequently a smallholder cotton supply chain is a good place to start, although the ultimate goal is to use blockchain technology to improve production conditions for smallholder farmers—regardless of the crop—and facilitate their access to data, markets and financial services.

The following companies, agencies and organizations are members of an advisory group that will monitor and provide input to this initiative, starting with the feasibility study and then for the pilot project to follow:

- American Chamber of Commerce in Haiti
- CO2Logic
- Colombia University School of International and Public Affairs
- Digicel-Haiti
- Fairtrasa
- Haitian Ministry of Commerce and Industry
- Kuli Kuli
- Patagonia
- Textile Exchange
- UN Women - Haiti
- UNOPS - Haiti
- Vans



Tree Currency

The SFA pioneered the concept of tree currency as a way for smallholder farmers to earn farm credits by growing, transplanting and looking after trees. Farmers exchange these credits for high quality crop seed, hand tools and training in organic agriculture. To date over 6.5 million trees have been grown in 30 nurseries operated by SFA farmers. The support triggered by these trees has resulted in increased crop yields that average 40% and household incomes have doubled on average. Tree currency will be fully integrated into the Blockchain Cotton Project in Haiti.

Coordination

The SFA will serve as coordinator of both the working group and its advisors. For further information contact Hugh Locke, President of the Smallholder Farmers Alliance and Impact Farming, at hlocke@earthlink.net.

About the Working Group Partners

- **Smallholder Farmers Alliance (SFA)** is a Haitian non-profit organization that applies business solutions to help feed and reforest a renewed Haiti by establishing market-based farmer cooperatives, building agricultural export markets, creating rural farm businesses and contributing to community development. The SFA is active in 5 areas of Haiti and operates 30 tree nurseries in those areas.
- **Impact Farming Foundation Inc. (IF)** is a U.S.-based non-profit organization that works with smallholder farmers internationally to advance small-scale business solutions that integrate sustainable food production with increased tree cover and self-financed community development. Impact Farming also supports the work of the Haiti-based SFA.
- **Better Sourcing Program (BSP)** is a provider of an innovative on-site technology-based traceability and due diligence system that is mostly deployed in artisanal and small-scale mine sites. Additionally, BSP collects rich data on local community conditions ensuring that interventions improve over time. BSP is supported by USAID and endorsed by the Responsible Business Alliance (RBA). It is headquartered in

London has a presence in Belgium, Spain, Rwanda and the Democratic Republic of Congo (DRC).

- **RCS Global (RSC)** is a supply chain due diligence advisory firm that works with companies to provide standard, audit and technology-based solutions for responsible sourcing risks in their supply chains. RCS Global's directors are co-founders and directors of BSP. It is headquartered in London also has a presence in Shenzhen and Johannesburg.
- **Timberland** is a global leader in the design, manufacturing and marketing of premium footwear, apparel and accessories for the outdoor lifestyle. Best known for its original yellow boot introduced in 1973, Timberland today outfits consumers from toe-to-head, with versatile collections that reflect the brand's rich heritage of craftsmanship, function and style. Timberland markets lifestyle products under the Timberland® and Timberland Boot Company® brands, and industrial footwear and workwear under the Timberland PRO® brand. Its products are sold throughout the world in leading department and specialty stores as well as company-owned retail locations and online. Timberland's dedication to making quality products is matched by an unwavering commitment to environmental and social responsibility – to make things better for its products, the outdoors, and communities around the globe. To learn more about Timberland, a brand of VF Corporation (NYSE: VFC), please visit timberland.com or follow them along the modern trail @timberland.

SFA cotton field trial site near Gonaives, Haiti

