

A close-up photograph of several bright red strawberries with green leaves, some showing water droplets, filling the frame.

Blockchain in Morocco

Blockchain for social compliance in the Moroccan strawberry supply chain

Lessons learned from the investigating field trip
Axfood, Axfoundation and SIM Supply Chain Information
Management, spring 2019.

1. Blockchain, the holy grail beyond audits?



The food chain is one of the most complex and fragmented of all supply chains. Due to the number of intermediaries and insufficient transparency level, companies struggle with the task to follow up and guarantee where and under what conditions a product has been produced. In this context, several social compliance mechanisms have been developed over the years and there is an increased focus on social standards to validate conditions in the chain.

With growing complexity, limitations and drawbacks to these mechanisms have become more apparent. Instead of building a common ground through a trustworthy joint standard, these mechanisms tend to set sector standards, or even company certifications, putting more pressure on upstream actors to guarantee compliance to an increasing number of controls.

Due to the limited possibilities to influence suppliers below tier 1, companies rely on third party auditors, assigned to visit farms or production facilities to manually check on compliance. These controls give companies a snapshot about current conditions at the production site. Furthermore, the auditing system is subject to risk of corruption. Hence, the quality of audits is uncertain. This is one reason to why company certifications have developed as a measure to safeguard control.

Despite their limitations, certifications are an increasingly important prerequisite for retailers and food producing companies. But only 12 percent of all farmers worldwide are certified against any standard (food safety or environmental/social compliance). Are there other solutions for those farmers, not holding a certification, to access our markets? Could innovative technologies be useful to check on social compliance and monitor continuous improvement in working conditions?

Blockchain, a technology originally designed for the financial sector and crypto currencies, has emerged as a potential solution for supply chain monitoring. It enables increased transparency through traceability throughout the chain. Moreover, blockchain provides a new sort of distributed database that democratizes the sharing of data. Once information is registered on the blockchain (provenance, production conditions, food safety and quality indicators, etc.), all actors in the chain own the same copy of a database with all transactions visible. The information can never be altered again. The simplicity of blockchain is essential for transparent and shared supply chain information, an asset traditionally guarded by separate actors and commonly abused or corrupted.

The project partners wanted to evaluate whether blockchain can help reduce the burden of compliance audits on farms and limit the influence of intermediaries.



2. Blockchain in the Moroccan strawberry supply chain



Blockchain technology is widely expected to resolve several limitations and to make social compliance mechanisms more robust. This project aimed to test this hypothesis, by evaluating the possibilities to collect and validate social data directly from strawberry farms in Morocco. The data of interest includes working conditions and wages. The Moroccan strawberry sector is identified as a high-risk supply chain by Oxfam and prioritized by Axfood in their living wage strategy. To go beyond a once-a-year audit visit, the goal was to investigate the opportunity to collect and verify data points through female farm workers and governmental institutions on a more continuous basis.

With a blockchain solution, providing a permissionless distributed ledger, the farms and workers themselves could provide data to the system and decide how to share this data with other supply chain partners. The project group wanted to test the idea that and, data would be shared in the blockchain with the supply chain partners and hence, signal deviation. Could this give all supply chain partners a near real-time insight into the working conditions on the farms in Morocco?

In the spring of 2019, Axfoundation, Axfood and SIM Supply chain Information Management conducted a field study on Axfood's Moroccan strawberry supplier. The purpose of the trip was to provide a deeper understanding of the local context in Morocco and to assess the suitability, including both opportunities and challenges, of implementing a blockchain pilot project focusing on remote auditing during the harvest season of 2020. This document wants to share the lessons learned from our experience.

3. From vision to lessons learned - blockchain beyond the hype



In order to create supply chain transparency and product traceability using blockchain technology, strong partnership and trust between all supply chain actors need to be present and there needs to be clear incentives for all the actors to share data. A technology like blockchain can only succeed when the players and the playing field is known, and trust is established.

Reality eats blockchain for breakfast

First and foremost, blockchain is just another system that relies on data input from people in the chain, hence the human factor has a great impact. Like all other system integrations, the success depends on the constructive collaboration and good intentions of all people in the supply chain.

Blockchain has the potential to reduce inefficiencies and increase transparency, but it cannot avoid malpractice by its users, or in other words "rubbish in; rubbish out". If you have primary data that is not objectively verified uploaded on the blockchain, there is a risk for insecure data on the other end. Therefore, blockchain must be combined with data verification and validations, smart IoT solutions such as sensors or chips, to guarantee that the digital twin of the physical product tells the right story about the product.

Blockchain must also be combined by capacity building initiatives focusing on relationship and trust building. In the case of Moroccan strawberries, input of data from workers would be challenging to verify. How would we ensure the source of information (worker) and the veracity of the actual data? Considering already existing problems with gender related discrimination in the Moroccan society and on the fields, poor education level among workers and power imbalance between workers, middlemen and farmers, one could assume it would not be easy for women workers to insert correct data on a voluntary basis with high integrity. Also, the input of data requires all workers to have access to a smartphone or cell phone with wi-fi connection.

Trust between chain actors is key

Usually it is said that blockchain creates trust between supply chain actors.

Blockchain was born out of the need to keep people honest in the absence of a central authority. But just because the data is on a blockchain doesn't mean the data is accurate. A prerequisite for accurate data is trust between the actors and validation of the data. Trust is needed to already be in place for a successful implementation of a blockchain solution. The technique requires a totally new level of collaboration, agreements, transparency and willingness to share sensitive data between actors. In the Moroccan strawberry case, there was clearly a "history" and a context that was a bit unexpected to the project group. The Moroccan strawberry industry has been under scrutiny for a decade by Oxfam Morocco which created resistance amongst strawberry farm owners to collaborate with Oxfam Morocco. The farmers expressed frustration and said they have addressed social issues following the critique but without receiving any business benefits. Even worse so, farmers had lost revenues over the years as a result of the public campaigns, driving buyers to other countries.

Also, the farmers did not trust the workers to themselves provide or insert data on the blockchain about their working conditions. The low trust between farmers and strawberry pickers has many reasons. The lack of labour in the agricultural sector is a salient issue for employers. Most of the workers are day laborers or seasonal laborers hence the loyalty between farmer and workers is quite low. The strawberry farmers expressed reluctance to let workers use an application for direct feedback to other parties, arguing that the workers would not provide accurate data. Unfortunately, and as a result of the mistrust from farmers, we did not have the opportunity to meet with the workers and get their perspective. These were factors making it hard to proceed in the dialogue with farmers and create a trusted environment to share data.

Who benefits from the results?

To successfully run a blockchain project the added value for each party in the chain must be clear. For the farmers in Morocco, the "what's in it for me" was one thing only: will I receive a better price for my strawberries if I participate? A reasonable question, but since our project was in the very early stage of testing a hypothesis, a premium for their product could not be guaranteed in the short run.

The farmers experience a constantly increased pressure from customers and other stakeholders to report on quality and sustainability. They feel they put great effort into audits, controls and reporting without experiencing any return on those investments in terms of a premium. Running a blockchain project, it is therefore important to identify whether the workload is less than the regular audits and how the value is distributed among the actors in the supply chain. And how do we make sure everyone benefits from the results?

Visibility of the supply chain is needed

We often say blockchain is a tool that helps creating transparency. However, blockchain benefits from established transparency, product traceability and sound relations in the supply chain. In other words, these circumstances need to be established first. Only then can the potential of blockchain technology be released; the democratization of data, shared by all the participating partners.

It is not possible to tell a product story (e.g. 'this strawberry has been picked on that day on that farm while all workers received at least legal minimum wage') unless all chain actors are known and verified with the comprehensive chain of custody trail throughout the supply chain. In several food supply chains, there are primary producers or producer organizations that buy additional produce from non-associated farmers and forward them to the buyer without the knowledge of that buyer. This is an industry-wide issue especially in fresh fruits and vegetable supply chains and one we came across in the strawberry sector in Morocco.

(A claim to be confirmed; in September 2019 Axfood made a traceability control and the supplier could in a convincing way trace all strawberries back to specific GAP-certified farms). In general, the volume of certified exports (like Global GAP) exceeds the production capacity of certified farms as such. Validation of volume exported by certified farms against their production capacity on their certified acreage, may be the holy grail to improve supply chain visibility and therefore transparency.

Buying power from the downstream players

Our blockchain project was initiated by Axfood and the idea was to implement it top down. In order for this approach to work, there needs to be enough buying power from the retailer and the processor/trader. In this case, the volume of frozen strawberries that Axfood yearly buys from its supplier is relatively low which weakens the business case for the Moroccan strawberry farmers to invest in collaboration and the required technology. In addition, Axfood's supplier is just one of the five or six big buyers for the strawberry farms that were supposed to be involved in the project. In general, the largest successful implementation of traceability project is characterized by a vertically integrated supply chain where actors are the main business partners to each other.

Segregated traceability

In order to have correct data travel with the product to the retailer or a step further to the consumer, full segregated traceability must be established. Axfood's supplier has decent mass balance traceability that works well as issue management process in case of recalls on batch level. Segregated traceability demands a change in the production and collection process and therefore needs a business case with high volume or a premium price. For example, Axfood's supplier supplies a Japanese client segregated traceable strawberries at a premium. In order to ensure that the strawberries only come from the 22 farms and therefore make a statement that the working conditions are in line with Axfood's requirements, segregated traceability and a cross check validation needs to be done on volume of produce and available land per farmer. Axfood today has the possibility to validate working conditions on processing level, monitored by amfori BSCI audits and including sample farms. However, the project group wanted to go further than this by getting firsthand validation from farm workers.



4. Conclusions and the next step



The previous chapter's lessons learned from the investigating field trip to Morocco has made the project group taking the decision to not move forward with a pilot project, harvest season 2020. First there needs to be trust between the supply chain partners, all actors will need to be known and have a clear incentive to share data and participate. This was not the case in this project. This is a human challenge and not a tech one. With the best of knowledge, the project group assumed all actors were known, trust was established, and incentives were there. In order to continue this path to transparency in the Moroccan strawberry supply chain:

- Dialogues will need to happen between Axfood, the traders and the farmers to establish trust and a clear incentive for all participant to take part of a blockchain pilot;
- The buying power will need to be increased (higher volumes potentially by collaboration with existing buying groups) and a premium would need to be paid to the farmers;
- Value distribution should be investigated in the full supply chain. Axfood has taken steps to address this topic.

This is quite some complex work and takes time. Once trust and clear incentive is established, step by step blockchain technology can underpin the established trust and processes and gradually more data can be shared. It can start with certifications, quality related data, followed by audit reports and additional evidence on working conditions and wages directly from the farms. Lastly, validation of the farm data can be done by workers.

Especially these last steps, collecting data directly from farms and validating work environment and wages data directly by the workers themselves, is the most interesting and ground-breaking path that needs to be tested. It might be interesting to try this in another supply chain where vertical integration is already in place and trust has been established between the supply chain partners. Given mentioned circumstances, we believe blockchain has great potential and we see some promising use cases globally. But we also see a lot of challenges related to realizing the potential of blockchain in the food chain. Hopefully sharing learnings as ours can help us get forward.



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