PROJECT «NETWORK FOR AGRICULTURE AND RURAL DEVELOPMENT THINK-TANKS FOR COUNTRIES IN MEKONG-SUB-REGION (NARDT)»

Regional research

Agricultural innovations review in Sub-Mekong region countries

Blockchain monitoring organic rice farming model in Cambodia (BlocRice)

2023

1. General information

The BlocRice project is facilitated by Oxfam in Cambodia and had begun their pilot run in 2018. This initial idea began from Oxfam Novib in the Netherlands and the BlocRice application was developed by Schuttelaar and Partners. This project incorporates the use of blockchain technology through an application which creates smart contracts and stores information and transactions between actors in the value chain. This blockchain technology arranges three-way digital contracts with cashless payments between primary producers, two agricultural cooperatives in Kulen (Samaki Phnom Pich Borey and Loeuk Kampuos Kasekor agricultural cooperatives), rice exporters (Amru Rice) in Cambodia and manufacturing companies (Sano Rice) in the Netherlands.[1]

2. Model development

Studies have been conducted on farmers' livelihoods in Preah Vihear province and it showed that they were living in an income gap of 31% as well as having poor access to materials. There are also issues of unequal distribution of information which affects farmers' negotiation power due to lack of knowledge on the market price.[2] Thus, the idea behind BlocRice was to improve farmers' livelihoods and income by monitoring payments and traceability between actors in the value chain, provide access to real time data and information, build trust and connect consumers to smallholder farmers in order to provide transparency and encourage consumers' willingness to pay premium price for the products they purchased. Furthermore, the cause of implementing this project stems from the situation of smallholder farmers in Cambodia who face several challenges such as contract violations as well as fluctuation of market price and unreliable payment dates from buyers, specifically middlemen.

Initially, BlocRice was implemented as a pilot project in 2018 which was independently funded by Oxfam Novib's innovation fund department. The pilot targeted 50 smallholder farmers and since it was completed, by 2020, Oxfam has received funds from the Netherlands' Enterprise Agency to prototype the blockchain technology used in this project. This prototype started in 2021 and the target was 500 smallholder farmers in Preah Vihear province.

As of now, the project is halfway completed as the rice had already been collected by the agricultural cooperatives during the harvest season in 2022 and is now stored in Amru Rice for them to process the rice. Before the farmers are chosen to register in the blockchain technology, they are screened from the two agricultural cooperatives to see how much land each farmer has and how much produce they can make in order to fit the contract

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[1] Oxfam in Cambodia (n.d.). *Blockchain for Livelihoods from Organic Cambodian Rice (Blocrice).*

[2] Schuttelaar & Partners (n.d.). *Empowering Smallholder Farmers*. Blocrice.org. Retrieved January 25, 2023, from https://www.blocrice.org/blocrice/empowering_smallholder_farmers

farming conditions between them and Amru Rice. Thus, the project now has 411 farmers registered among 500 in 2022.

Once farmers have collected their harvest, they will sell their rice to agricultural cooperatives and a digital contract will be signed between both parties. The agricultural cooperatives will then sell the rice from farmers to Amru Rice, which will establish another digital contract for the sales of rice required due to the conditions set within their contract farming agreement. The payment will be processed when Amru Rice receives the rice from the agricultural cooperatives and the agricultural cooperatives will provide the payment to the farmers. However, if the rice sold to the agricultural cooperatives are not in large quantities, the agricultural cooperatives will also process the payment beforehand for farmers. Afterwards, once Amru Rice receives the rice, they will process the rice and ship them to Sano Rice in the Netherlands which will then create another digital contract. Sano Rice will process the rice into rice crackers and sell them to retailers such as Do It Organic, UDEA and Ekoplaza.

Within this creation of the prototype, the developer is also trying to limit the data elements and input as much as possible in order to provide user-friendly characteristics to farmers. There is no solid application format formally disseminated yet; however, in order to register farmers and create an account for them there will be inputs of: their names, whether they are farmers or agricultural cooperatives, types of crops they are selling, their field actions and they can pick their buyers if they are selling. Moreover, the Analyzing Development Issues Centre ("ADIC") in Cambodia is also involved in the evaluation process to conduct research on the impact of the BlocRice project and examine how this implementation has improved farmers' livelihood.

3. Opportunities and challenges

There were several challenges faced while implementing the project. Firstly, the knowledge capacity and digital literacy among farmers is not yet enhanced in Cambodia and there are also issues with infrastructure to use this application as farmers may not have access to internet connections or the adequate smartphones to use. With this issue, Oxfam supported farmers and sees this as an opportunity by providing them with smartphones to ease their usage alongside training as well.

Secondly, Oxfam is still trying to explore for local partners to support BlocRice's system maintenance in order to make the application as simple and user-friendly as possible. However, they are still in the process and have not found a partner yet.

Lastly, there is still a lack of trust between farmers and actors in the supply chain because most businesses tend to think about their personal profits and there are many conditions to be applied in order for each actor in the value chain to fully trust one another. Thus, financial support from the government would be beneficial in this project because

there has been support in the past from the public sector; however, there are still more commitments needed.

Oxfam sees potential in this project and not just for rice because they could expand to other commodities such as cassava, potatoes, cashew nuts and pepper if there are opportunities for them to expand. The application itself already is working but if they would like to expand to other commodities, they would have to explore with local people step-by-step to see whether it would work to endure the sustainability because such expansion would need resources and support.

BlocRice would also like to test their branding that they have built because Cambodian organic rice is internationally recognised; thus, if the international markets value Cambodian products, this would increase the demands and the supply would increase simultaneously and this would contribute to sustainability for farmers.

4. Conclusion

This experimental model has had many successes, but to be widely applied and deployed in practice, certain conditions are needed. Although there were many workshops and regulations established to steer the development of digitalization in Cambodia, the population that receives and has access to the tools and knowledge are still limited which may slower the progress in terms of meeting the demands of production or the requirements that are set out in the models' application.

Nonetheless, Blocrice strives to improve this aspect with the help of partners as well as seeking for government's support and national or international support because its traceability characteristics, farmers' livelihood in a long-term aspect is expected to enhance and develop better market price as well as negotiation power to maintain sustainability in the agricultural value chain. /