

BLOCKCHAIN MODEL FOR CANE DEVELOPMENT WITH RESPECT TO FARMERS

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Abstract - Sugar Factories and Sugarcane growers-farmers are playing a vital role in socio-economic development in the rural area by utilizing rural resources and enable for employment opportunities in India. The aims of the study is to understand the Cane Development process, design a Blockchain model for cane development (CD) with respect to Farmers and know advantages of it with respect to the Farmers.

Today cane growers-farmers are not able to deal with Sugar Factories and finding difficulties in growing cane production because lack of proper guidance or resources. Therefore a Blockchain model for cane development (CD) with respect to Farmers needs to collaborate with Cane Development Department (CDD) of a Sugar Factory. It is more beneficial to the Farmers to adopt the new methodologies for develop their cane field under the guidance of Cane Development Department (CDD) of a Sugar Factory. Blockchain model has ability to bring the change in Farmers economic background. It adds in Farmers confident level, increase in cane production without putting more efforts and cost. Blockchain model bridge the communication gap and transparency in between Sugar Factory and Farmers.

Key Words: Blockchain, socio-economic development, India, Sugar Factories, Sugarcane growers, Farmers, Cane Development (CD), Collaboration, Methodologies, Production, Cane Development Department (CDD).

1.INTRODUCTION

Cane Development Department (CDD) used to offers a Blockchain based Cane Development Program to the sugarcane farmers. Program includes a detailed soil information, scheduled plan for healthy sugarcane farming and also includes up to date weather information to justify farming decisions at the right movement. Approaching Blockchain model is fully secure, exchange digital information, perform deals and transactions in decentralized manner which logged into digital ledger as a hash containing block. Updated latest copy of ledger helps to validate the latest transactions by the individuals in the network. Model will allow ledger to contains schedule plan, records, transaction details and information packed together, this package called block. blocks are nearly impossible to alter or hack. These blocks hold incorruptible trust.

Sugarcane farmers or CDD can put any data of value on Blockchain. Anodyne information about the entire cycle of sugarcane production or Cane Development process on Blockchain model enables transparent and trusted source of information for the sugarcane growers and CDD.

Farmers can get quick data related to the soil moisture, seed quality, weather & environment related data, equipment, payments, etc. all at real time and one platform.

Blockchain will help in establishing direct link between farmers and CDD, also help to empowers small farmers to reach the market without taking any help from middleman or third party.

2. LITERATURE REVIEW

Indian agriculture can expand in huge transformation with the help of Blockchain decentralized N/W technology which builds trust and provenance for end users. In India most of the farming sectors are largely dependent on government subsidies and their policies. sugarcane production is best example one of them. For the year 2017-18 USD 4.9 billion (INR 32,000 Cr) were allocated for agri-related subsidies to farmers in India. But the real amount reached to the farmers is vague. It happens because of lacking in information transparency. [11] Blockchain guarantees helps to control corruption by its open decentralized transparency in trusted network and/or compliance through smart contracts.[12]

The literature found in the area related to Blockchain technology in food safety, food supply chain to make supply chain more transparent and efficient resulting in lesser food and resources wastage. In agri-inputs where farmers are not aware about being cheated by buying fake products. Farmers get to know authenticity and source of products. In land title registering for buying and selling properties is more susceptible to fraud. In disbursement of subsidies, lack of transparency to reach money to needy.

There is no literature found in the area of Blockchain technology and Cane Development for Sugar Industries. Not a single study describes the process of Cane Development. No Blockchain model exists for providing services to the farmers for Cane development. However in cane development area Blockchain technology is missing in the literature. Therefore a lot of scope is exists for the research in same area.

3. OBJECTIVES

1. Understand the Cane Development process.
2. Design a Blockchain Model for Cane Development.
3. Explore the benefits of a Blockchain Model with respect to the Farmers

4. FUNCTIONS REQUIRED FOR CANE DEVELOPMENT

Cane Development system offers functionality in the form of use cases like new registration, acknowledgement receipt, soil sample collection with plot details, generate soil analysis report, display schedule, provide fertilizers and resources etc. The stakeholders involved in this system are farmer, cane development department of Sugar Factory, soil analysis laboratory and chitboy. The use cases describes functional view of a system which are offered for stakeholders outside the system boundary. The need of basic functions for the stakeholders in Cane Development is described with the help of Use Case Diagram as below:

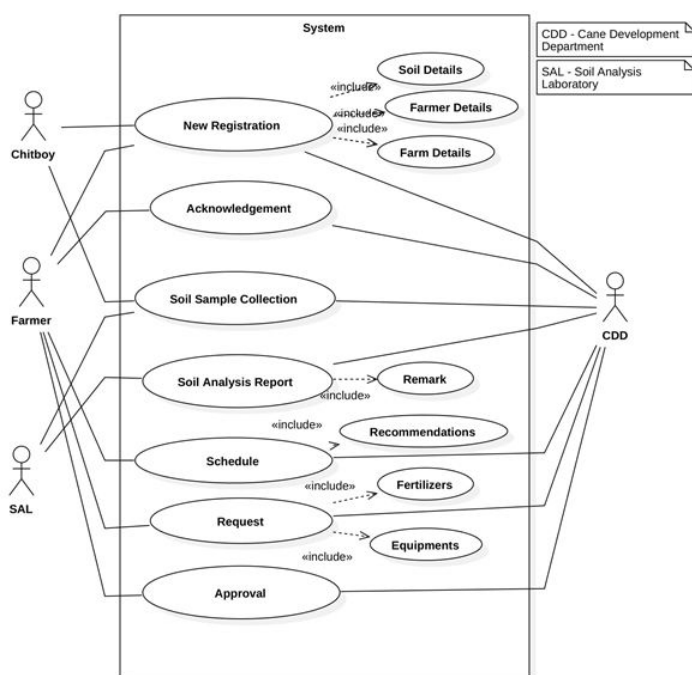


Fig -1: Cane Development Model Use Case Diagram

4.1 BLOCKCHAIN MODEL FOR CANE DEVELOPMENT

The process starts with the Cane Development Department collects interested farmers details, land details and soil samples through Chitboy. Chitboy is an CDD's representative which help farmers to register in the cane development program and explain CDD policies. Collected information directly stored on cloud through CDD in base of Blockchain model. Uploaded information validate by all active members in network, they can be CDD members or other farmers from the network also provides transparent and trusted source of information for the farmers. Farmers can directly add information on cloud means can register by self.

On the other side soil analysis laboratory performs a multiple tests to acquire the actual type and quality of soil and post back to the CDD. Experts in CDD will prepare cane development schedule according to quality of soil to gain more production of cane in less efforts, cost and time. To the sense for farmers, they can get support related to the seed quality, soil analysis report, soil condition etc. all at one platform which establishing direct link between farmers and Cane Development Department. This reduces the problems as Blockchain gives transparency in supply chain and enabling farmers to get more cane production. The Blockchain model for Cane Development is depicted as below:

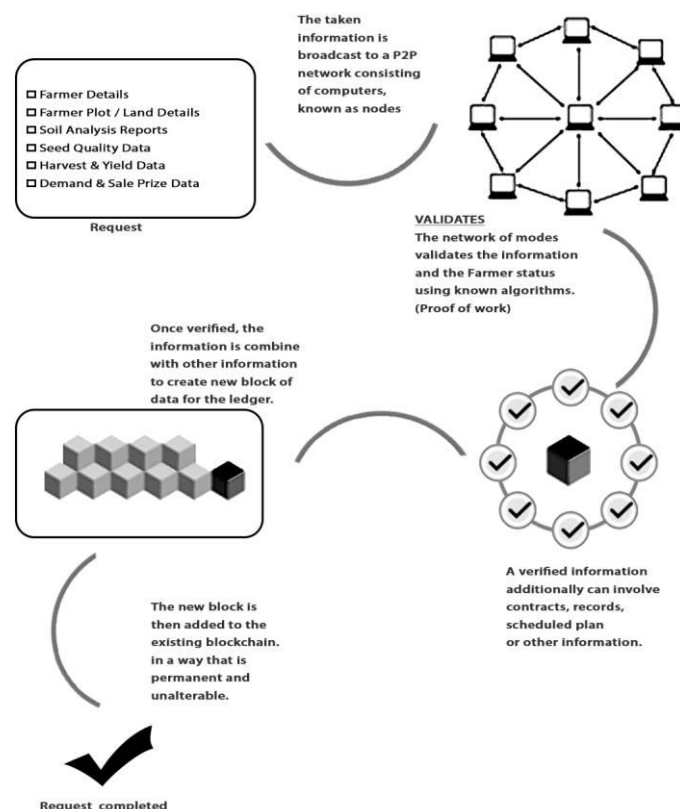


Fig -2: Cane Development Blockchain Model

4.2 ADVANTAGES OF BLOCKCHAIN MODEL FOR FARMERS

1. Blockchain model provides better credit facilities for farmers.
2. Transparency and faster access to information between farmer and CDD in sugar factory.
3. Provide guidelines to farmers timely to develop their cane crops
4. Transparency in services between farmer and CDD in sugar factory.
5. Transparency in schedule implementation and monitoring cane development process.
6. Improve farming productivity and profitability.
7. Provides resources and guides for its proper utilization.
8. Ensure the financial stability of farmers.
9. Save time and total cost of farmers and sugar factories.
10. Easy to implement.

5. CONCLUSIONS

The Blockchain applied model is beneficial for reliable source of information to the CDD and farmers. Trusted cloud based information can directly connect farmers to the CDD or CDD to soil analysis laboratory and vice versa. Validate and up to date information also help in farming and fertilizing process at the genuine required time without delaying schedule. CDD can expect an efficient supply of resources and improved cane development tracking for farmers cane farming.

All the information starting from seed procurement to harvesting process can be available for farmers on the Blockchain model. This will greatly help to farmers in quantifying, monitoring, and controlling the risks occurring throughout sugarcane planting to harvesting process. Blockchain is a promising technology towards a transparency for cane development inputs. Therefore Blockchain technology is used as an enabler of service system with respect to the farmers.

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