Decentralized Trust-Less Insurance for Farmers

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Abstract- ***Farmers suffering due to drought and flood, to the extent of committing suicide, is a huge problem in India. Even though government tried and is still trying its best to solve this problem, but clearly the problem is still unsolved even today. A centralized trustful system to solve such problems is prone to corruption and other unethical practices. A decentralized trustless system will prove to be very useful in such situations. Through blockchain technology, the system promotes trust in a trust less environment wherein the farmers and the private investors go into a contract.***

Indexed Terms- Block chain, Smart Contract, Crop Insurance, Decentralized, Peer- to-Peer, Farmer, and Agriculture

I. INTRODUCTION

The problem of irregular and unpredictable weather is largely unavoidable in developing countries, or countries in the ecologically sensitive and vulnerable zone, India being one ofthem, where the problem of farmers committing suicide due to erratic weather and large debt with poor regulatory bodiesis a large one. Although different policies have tried to address this, the implementation of it hasn't properly reached the different parts of the country, and with a democratic decentralized widespread useful entity, the Internet, we hope to solve the problem.

With majority of the population still residing in villages, and with the gradual progress and advent of the tertiary sector, the agricultural production, although still a major contributor to the Indian economy is largely overlooked with little to no significant sufficient measures in place to safeguard farmers' interests, especially with problems like climate changemaking it worse in the foreseeable future, thus making it extremely vulnerable. Although the problem is partly mitigated by government schemes and cooperative societies providing necessary capital in the form of loans and insurance. Although the concept of insurance isn't new, with the widespread prevalence of the zamindar/landlords, who are notorious for exploiting the farmers, the problem is exacerbated. The dire problem stated here can be solved by replacing the existing financial institution which views farming as a largely vulnerable and loss-prone practice, a new insurance model with a more decentralized, transparent, and rapid mechanism that considers both farmers' and investors' interests could be employed. Agriculture is a major contributorto the state exchequer, while at the same time being subject to extreme risk, particularly when it comes to minimizing production risk through risk management products such asinsurance. Although there are ways such as using accurate weather forecast models, and using genetically modified crops,there is no complete model for risk reduction in the current context. The prescribed procedure is substantial, transforming the insurance model into a more decentralized, transparent, and timely system that considers the interests of all the stakeholders involved. Farmers are inherently risk-prone since they are heavily exposed to danger due to the unpredictable nature of the variables involved. In the absence of insurance, planting pattern and occupation must disperse risk to address output risk hence a farmer's best bet is to insure the crop and pass the risk to the insurer.

The notion of crop insurance is not a new one in India. In response to the critical need for crop insurance that provides farmers with security, the government has created the Agricultural Insurance Scheme (NAIS) and the Weather Based Crop Insurance Scheme (WBCIS).

II. LITERATURE SURVEY

Agriculture is the lifeblood of India's economy, contributing 24% of GDP, providing employment for 56% and supporting 70% of the population. Various studies have been conducted on farmer safety. This includes a decentralized peer-to-peer framework for crop insurance that can overcome current problems by protecting farmers' interests, eliminating middlemen and providing a safe, standardized and transparentsystem that does not block information. It is included. From stakeholders. Through blockchain technology, the system promotes trust in a trustless environment where farmers and private investors sign contracts.

These papers also include research papers based on monitoring farmer accounts and transactions using blockchain systems, and from a theoretical and practical perspective, food supply chains, agricultural insurance, smart farming, and agricultural products. We are considering applying blockchain technology in transactions. Various studies explore the impact of blockchain technology in agriculture and food supply chains, present existing and ongoing projects and initiatives, take a critical look at the maturity level of these projects, and assess their general impact. , challenges, and possibilities. Our results show that blockchain is a promising technology for transparent food supply chains, withmany ongoing initiatives in various food and food-relatedtopics. These challenges include technical aspects, education, guidelines, and regulatory frameworks.

Farmers are often reluctant to insure their crops due to a lack of trust in insurance companies and fear of late or unpaid claims, which is why blockchain-based insurance solutions have emerged. This whole scenario is disrupted by blockchain smart contract implementation in insurance. Blockchain and innovative contract technology provide immutable data storage, security, transparency, trust, and security in initiating the transaction process. Blockchain implementations allowthe entire insurance process, from authentication to settlement of claims, to be carried out more transparently and securely.

III. METHODOLOGY

The tools used to implement distributed systems are: Blockchain platform used system wide on Ethereum. An open-source decentralized blockchain platform that supports smart contracts. Smart contracts and their logic are written in Solidity. The main reason for writing code in Solidity is that the decentralized system resides on Ethereum, a popular blockchain platform provided by Solidity. It follows object-oriented methodology. Smart contracts contain important logic that supports the goals of the system. The system's front-end and user interface (UI) are coded using the React Web Framework. This is an open source JavaScript-based library for creating UI components. We used the React framework to convert a decentralized application (DApp) intoa Progressive Web App (PWA) and make it available as an application on both Android and iOS systems. Smart contracts are connected to the frontend via React. The development environment used is Truffle Suite, an end-to-end solution for creating and testing DApps. Ganache, a localblockchain development application for Ethereum that is part of the Truffle Suite, is also used to develop and deploy DApps and visualize data contained in blocks, transactions and contracts on the blockchain. .It is very important to always get and display the latest data from the blockchain. To facilitate this, Drizzle is used for the UI along with React, a collection of libraries that facilitate DApp development.

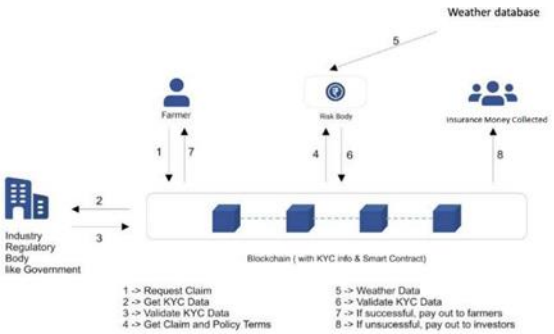

Figure 1: Creation & Claiming of Policy

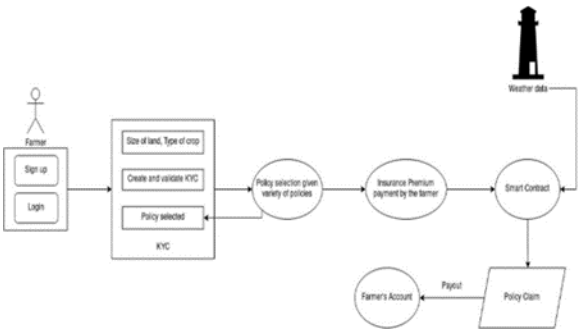

Figure 2: System Architecture/Design

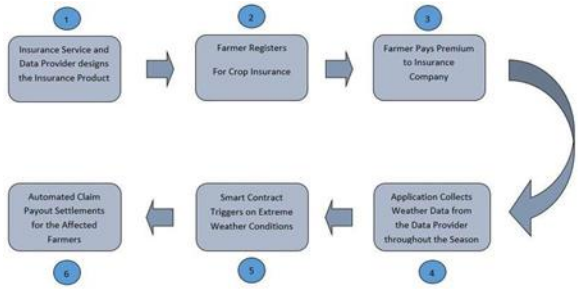

Figure 3: Workflow

CONCLUSION AND FUTURE SCOPE

With over 40% of the population directly dependent on agriculture, this could be of great help to our country's agriculture. Our solution will therefore help financially protect food producers in India and provide them with better information about weather conditions. A covered secure environment is established.

Insurance pay-outs depend on weather conditions and numberof affected days. Additionally, MSPs can also be integrated into decentralized platforms, thus eradicating corruption at these levels. Provides information about governmentsubsidiaries. All of this can only happen through government intervention. It will also end unnecessary crop price inflation from third party hoarding.

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