

## ABSTRACT

Indonesia's agricultural sector faces growing climate risks, while conventional crop insurance remains slow, costly, and prone to subjective claim assessments. This study proposes a blockchain-based parametric insurance model that automates payouts using smart contracts and weather data from oracles, delivering timely and objective compensation without manual damage assessment. The system uses decentralized storage to secure policy and farmer data. The model introduces the FarmFund Pool, a decentralized liquidity mechanism powered by BEP-20 tokens. The FarmFund Pool allows investors to stake tokens to provide capital for claims and receive rewards proportional to their stake and duration. During non-claim periods when no weather trigger occurs, the system utilizes idle funds by providing loans to farmer cooperatives. These loans are repaid with interest, ensuring capital circulation and improving fund sustainability. Alongside the liquidity mechanism, the model issues insurance policies as BEP-721 tokens containing essential metadata, securely stored in decentralized infrastructure to ensure traceability and data integrity. This study is one of the first to design a blockchain-based parametric insurance model integrating liquidity tokenization and cooperative-based fund recycling in the Indonesian context. This model provides a practical application of blockchain to streamline crop insurance workflows, build institutional trust, and provide a scalable mechanism for climate-adaptive risk protection.

**Keywords:** blockchain, crop insurance, smart contracts, parametric insurance, farmfund pool