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Investigating Slow Technology Adoption of Indonesian Agriculture: Focusing on Startup Ecosystem

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CONTEXT

The integration of technology-based solutions in agriculture has been widely acknowledged to enhance productivity, sustainability, and economic opportunities in rural areas. A range of innovative products and services are now available in the market provided by so-called “agritech” or “agtech” startups. Innovations such as agricultural marketplace, farm management software, IoT & AI based technology, precision agriculture, smart equipment, agri-financing, biotechnology modification, digital advisory, and the list goes on, but these agritechs have adoption challenges. Indonesia's agricultural sector, highly crucial for the nation's economy, is facing challenges in embracing these modern technological advancements, far behind its neighbouring countries such as Australia and Thailand. Despite available innovations, there is a significant gap and delay in their adoption within traditional agricultural practices that has been highlighted as a national problem for many years. This situation is influenced by a variety of socio-economic, cultural, and infrastructural elements. Recognising the potential of startups in revolutionising the sector, this research explores the dynamic complexities of agricultural innovation adoption efforts that focuses on the startup ecosystem through the preliminary system dynamics approach.

PURPOSE

This research aims to investigate the complexities hindering technology adoption in Indonesian agriculture, specifically focusing on the role and impact of the agricultural startup ecosystem.

APPROACH

In this preliminary study, a desktop research approach was employed, involving a review of existing literature, reports, and case studies relevant to agricultural technology adoption and startup case studies in Indonesia. The focus was on synthesising information from secondary sources to construct a causal loop diagram. This diagram aims to conceptualise and visualise the complex interdependencies and feedback mechanisms influencing technology adoption and startup ecosystem in Indonesia’s agriculture sector, before progressing forward to primary data collection such as surveys or interviews.

RESULTS

Initial findings suggest that while startups are growing fast in introducing innovative technologies, their impact is dampened by issues such as limited infrastructure and market access, socio-cultural behaviour barriers, inadequate funding, and regulatory challenges. The causal loop diagram indicates that these factors create a network of feedback loops, complicating the adoption process. Identifying key points within the startup ecosystem, such as investor engagement and policy support, has emerged as a critical aspect for improving technology adoption for Indonesia’s agriculture and startup sustainability.

CONCLUSIONS

Preliminary conclusions suggest that the slow technological adoption in Indonesian agriculture is intricately linked to economic, social, and infrastructural factors, rather than being a technological issue. It points towards a multifaceted challenge in agricultural technology adoption, where the agritech startups play a pivotal role. Overcoming these challenges requires an ecosystem-focused approach, emphasizing the support of agritech startups as a significant means to accelerate technology adoption in Indonesian agriculture.

KEYWORDS

Agricultural technology adoption, Causal loop diagram, Startup