

Achieving Smart Agriculture Potential through Efficient Data Connectivity and Management

SEED Practitioner Labs Policy Prototyping – Thailand 2020



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LISTENFIELD

Focus:	Climate smart agriculture, climate change mitigation and adaptation
Ecosystem Impact:	Access to technology, access to information
Lab Cycle:	Policy, Thailand 2020
Solution Developers:	ListenField

However, a basic requirement for agri-tech start-ups is sufficient and good quality data. ListenField, an eco-inclusive enterprise providing a digital platform to improve farming productivity, works with over 30 farmer communities throughout Thailand. As part of the SEED policy Labs, it has identified 1) insufficient access to data and 2) data centralisation as two main challenges that keep them from optimising their analytical prediction ability and producing precise recommendation to farmers.

Background

The agricultural sector employs over 30 percent of Thailand's labour force. However, it accounts for only 10% of its gross domestic product.¹ The sector shows slow growth rates and is more fragile than the countries' other economic sectors. This is due to the widespread use of traditional farming methods which are maladapted to unpredictable rainfall and seasonal patterns as a result of climate change. Challenges in farmers' lives such as ineffective farm management (especially for smallholder farmers) and climate uncertainty damage farmland and cause crop losses every season. Moreover, lack of diverse market opportunities is a main barrier for farmers in emerging economies.

Farmers thus face high economic risks and earn low incomes due to low productivity despite significant investments in the sector and the earmarking of agriculture as a priority sector in the Agriculture 4.0 strategy under the Ministry of Agriculture and Cooperatives.² Agriculture 4.0 aims at addressing farmers' low incomes by driving a value-based or innovation-driven economy and incorporating technology to improve traditional farming techniques. This includes using precision agriculture, climate smart agriculture, digital technology and the internet of things in the agricultural production process and value chain to adapt to climate change effects.

To achieve this policy goal, agri-tech start-ups have much to contribute and benefit from. They can close the gap of low productivity and added value of most agriculture yields and products by leveraging the aforementioned technologies.

Solution Overview

Listenfield's experience has shown a huge gap in data aggregation between government, academia and the agricultural industry. One main challenge to deep-tech solution successes is data integration from different sources in order to get quality and reliable data to produce precise analytical models. The process of data aggregation can be costly as it involves a wide range of activities from on-ground data collection to purchasing satellite information. This hinders both farmers and agri-tech actors like ListenField from better contributing to an innovation-driven economy, and incorporating technology in agricultural practice, the objective of Agriculture 4.0.

ListenField provides agronomic insight for sustainable and profitable farming. The technology improves crop productivity by utilising an application programming interface (API), IoT³ integration, predictive analytics, and farm management solutions and improves farmer wellbeing by connecting actors in the food chain ecosystem.

ListenField's farm management tool helps smallholder farmers towards better farm management, reducing crop loss due to climate uncertainty, obtaining better support from the community and encouraging them to convert to organic farming, as well as linking them to a marketplace. The platform connects all stakeholders and delivers transparency. The prototype calls for further collaboration with public department representatives engaged at the labs to validate and to replicate it for the wider smart-agriculture industry. It also calls on policy actors i) to

¹ Bank of Thailand, 2019. "ภูมิทัศน์ภาคเกษตรไทย จะพลิกโฉมอย่างไรสู่การพัฒนาที่ยั่งยืน?" (Thai agricultural landscape: How to change to sustainable development?). Retrieved from https://www.bot.or.th/Thai/ResearchAndPublications/articles/Pages/Article_26Sep2019.aspx

² Ministry of Agriculture & Cooperatives, 2017 "แนวคิดเกษตร 4.0 ของรัฐมนตรีว่าการกระทรวงเกษตรและสหกรณ์" (Agricultural Concept 4.0 of the Minister of Agriculture and Cooperatives). Retrieved from http://survey.rid.go.th/th/images/file/circular_notice/4523-60.pdf

³ Internet of Things

share government data in an open source way; ii) to explore the possibility to gain access to more specific data such as soil profiles and area specific climate histories; and iii) to co-create solutions to farmers' challenges based on ListenField's Analytic Models such as climate analysis, drought/dry spell.

ListenField's interface ecosystem prototype offers analysis of data that increases productivity from multiple stakeholders to benefit smallholder farmers. The platform faces two key challenges: i) insufficient access to data and ii) data centralisation that hinder sound analysis. By collaborating with government, the platform can solve these bottlenecks to provide more and better information to smallholder farmers.

Fig1: ListenField's API ecosystem prototype for climate smart agriculture



Benefits to Eco-inclusive Enterprises

This solution enables farmers and agricultural MSMEs in Thailand to address several challenges by:

- **Increasing crop productivity and income** by providing agronomic insights and data to help smallholder farmers better manage their farms and become less vulnerable to climate change-related challenges

4 Oxford Business Group "Agriculture remains crucial to Thailand's economic growth". Available at <https://oxfordbusinessgroup.com/overview/driving-force-agriculture-remains-integral-economic-growth>

5 Suwannarat, P. "Agricultural Productivity and Poverty Reduction in Thailand", Bank of Thailand. Available at https://www.bot.or.th/Thai/Segmentation/Student/setthata/Dolib_Settha_BE_2554/B_Doc_Solace2_2554.pdf

6 Thailand Board of Investment "Thailand 4.0: A New value-based economy" http://www.boi.go.th/upload/content/Thailand,%20Taking%20off%20to%20new%20heights%20@%20belgium_5ab4e8042850e.pdf

- **Mitigating risks of natural disasters** and suggest adaptation measures to small holder farmers using precise scientific methodologies.
- **Linking farmers to a marketplace** through ListenField's farm management tool.

Policy Benefits

Implementation of this interface ecosystem prototype will contribute to Thailand's policy goals in different ways. Although the economic impact of agriculture is not as robust compared to manufacturing, service, and retail sectors, the agriculture industry is a vital 'social backstop' for Thailand's lower income population.⁴ It is a source of income for the poorest 20% of the population.⁵ Unfortunately, climate change effects (drought, flood, soil quality, pests and unpredictable rainfall) cause significant crop losses and threaten the livelihoods of those at the bottom of the pyramid. Agri-tech start-ups like ListenField provide innovative solutions to increase farmers' productivity and income, contributing to an innovation-driven economy with economic, social and environmental benefits⁶.

Challenge Host Contacts

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SEED Practitioner Labs Policy Prototyping

SEED Practitioner Labs Policy Prototyping work with policymakers and intermediaries over a multi-step collaborative process. Through this process, participants design policy instruments that increase access to and improve the quality of support mechanisms for socially inclusive and environmentally sustainable enterprises looking to scale their environmental, social and economic impacts.