

# Perceptions and Experiences of Precision Agricultural Technology Adopters: A Multi Case Study of Taiwan and the USA

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1

## Introduction

Precision Agriculture Technology [PAT] has evolved from yield mapping and variable-rate application to data management, decision-making, and automation. However, the level of adoption varies between countries due to differences in culture, policies, and socio-economic factors. In Taiwan, the adoption of PAT was influenced by factors such as the availability of government subsidies, access to information, and farmers' attitudes toward technology (Lin & Lee, 2015). While the adoption of PAT in the USA was influenced by factors such as farmers' age, farm size, and educational level (Kadanali & Kizilaslan, 2018).



2

## Theoretical Framework

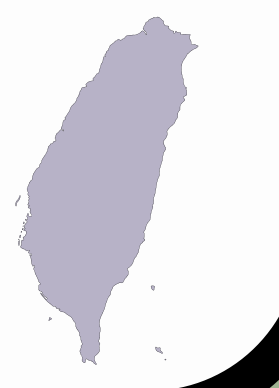
The Unified Theory of Acceptance and Use of Technology [UTAUT] was used to guide the study. According to Venkatesh and Davis (2000), UTAUT can be used to understand and predict how individuals will adopt and use new technologies in various contexts. UTAUT presumes that four key factors influence individuals' intention to use technology, which includes performance expectancy, effort expectancy, social influence, and facilitating conditions.

3

## Objectives

This study was intended to explore the perceptions and experiences of precision agriculture technology adopters in Taiwan and the USA. Given these circumstances, this study attempts to answer the following research questions:

- 1) What are the perceptions of precision agriculture technology adopters in Taiwan and the USA?
- 2) What are the experiences of precision agriculture technology adopters in Taiwan and the USA?
- 3) What factors influence the adoption and use of precision agriculture technology in Taiwan and the USA?
- 4) How do the perceptions and experiences of precision agriculture technology adopters differ between Taiwan and the USA?



4

## Methodology

To accomplish the purpose of this study, an instrumental multiple-case study design was implemented (Eisenhardt, 1989). A qualitative approach and snowball sampling procedures were leveraged to collect 21 interviews (Naderifar et al., 2017). Semi-structured interviews were conducted both in-person and virtually. The interview questions were originally in English and then translated into participants' native language to ensure language particularities. The researchers conducted the interviews using a predesigned piloted interview protocol. The protocol had twelve major guiding questions and several probing questions depending on participants' responses to the major questions.



## Findings

A total of 21 farmers participated in the study and all of them were men (Taiwan = 10, USA = 11). Quotes from Taiwan participants are denoted as PT while US participants are denoted as PU.

- PAT adopters commonly experience high productivity levels attributed to the utilization of technology. PT4 said, "The system is quite positive to improve the efficiency of our crop production and production system so that we can have a decent improvement in terms of economic benefits". PU7 supported these sentiments by saying: "Yes, honestly, we're using less equipment, meaning fewer tractors and fewer plows".
- Convenience and efficiency emerged as the primary factors motivating farmers to adopt PAT. PU2 said, "I can't imagine life without it." Similarly, PT4 said, "The autopilot is more accurate, user-friendly, and interesting."
- Finally, the study identified variations between Taiwan and the USA concerning the extent of farming operations, types of agricultural activities, utilization of self-driving machinery, the timeline of adoption, channels of information sources, and approaches to funding mechanisms.

5

## Conclusions/Recommendations

- Taiwanese farmers predominantly depend on the government and extension services, while American farmers rely more on dealers and the Internet.
- Acknowledging the diverse range of familiarity and exposure to PAT underscores the importance for professionals to create and execute thorough training and educational initiatives tailored to the varying levels of expertise among farmers.
- Overall, participants held positive perceptions about the adoption and future of PAT, indicating that they found value and benefits in incorporating PAT into their agricultural practices.
- Future research should deepen the understanding of PAT adoption and its impact on different countries to address emerging challenges and identify strategies for maximizing benefits through extension services and educational development.

6

## References

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7

## Scan for abstract

